

# Self-Harming Behaviour and Its Comorbidities

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## ABSTRACT

Self-harming behavior represents a clinically significant and multifaceted phenomenon that frequently co-occurs with a broad spectrum of psychiatric conditions; however, data on its comorbidities within the Slovak population remain scarce. The present exploratory study aimed to provide an overview of the prevalence of mental disorders among individuals engaging in self-harm, to examine potential sex differences in comorbidity patterns, and to explore associations between age and the occurrence of selected comorbidities. Data were collected from 135 psychologists and psychiatrists, each reporting on one self-harming client (N = 135; 85.2% women; age range 12–55 years), using an anonymous checklist based on the DSM-5 diagnostic framework, supplemented with additional clinically relevant categories. Due to non-normal distribution and unequal group sizes, non-parametric statistical procedures were applied. The results indicated that self-harm rarely occurred in isolation and was most frequently associated with relational problems in the family, anxiety disorders, depressive disorders, suicidal behavior disorder, and personality disorders. Positive associations with age were observed for personality disorders, depressive disorders, substance-related and addictive disorders, and abuse and neglect. Sex differences emerged in several domains, largely reflecting established epidemiological trends. These findings underscore the necessity of comprehensive, multidimensional clinical assessment of individuals who self-harm, while also highlighting the need for longitudinal and methodologically rigorous research to clarify developmental mechanisms and causal relationships underlying psychiatric comorbidity in self-harming populations.

## 1. Introduction

Self-harm is a frequently occurring and highly risky form of behavior that appears mainly in adolescence (ages 11–19 – Wiggin et al., 2025) and early adulthood (ages 20–30 – Steinhoff et al., 2021). Although there is currently no consensus on which specific types of behavior fall under self-harm (see, for example, the discussion regarding indirect forms of self-harm – Rubæk & Møhl, 2024, or the presence of suicidal tendencies – Tørmoen et al., 2013), most definitions are characterized by understanding self-harm as behavior carried out by an individual whose primary conscious intention is to harm themselves (physically and/or psychologically). The seriousness and relevance of the issue of self-harm is also evidenced by the fact that the American Psychiatric Association (APA) included nonsuicidal self-injury (NSSI) as the most transparent part of the spectrum of self-harming behavior in the chapter

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“Conditions for Further Study” in the Appendix of the fifth revision of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). The aim was to encourage scientists and professionals toward more intensive and in-depth research leading to a better understanding of these conditions and to provide data for decisions about their possible placement in forthcoming editions of the DSM (American Psychiatric Association, 2013a).

Among the key pieces of information necessary for establishing self-harm as a potentially new nosological entity are not only diagnostic criteria but also a range of additional information. Attention is typically directed to prevalence rates (due to the unclear definition, they range widely from 6% – Lim et al., 2019 to as high as 50% – Haregu et al., 2023), to its development and course (Liu, 2017; Oppenheimer et al., 2022), risk and prognostic factors (Richardson et al., 2024; Skrivankova et al., 2025), culture- (Al-Sharifi et al., 2015) and gender-related (Victor et al., 2018) issues, as well as the area of comorbidities.

The rationale for identifying comorbidities of self-harm lies not only in the fact that data on frequently co-occurring mental disorders constitute a standard component of the description of nosological entities in any system of diagnostic manuals, but also in the recognition that: (1) they contribute to understanding the mechanisms accompanying self-harm; (2) many psychological difficulties may underlie the emergence of self-harming behavior; and (3) they may simultaneously represent its consequences. An illustrative example of the complexity of the relationships between self-harm and other mental disorders or difficulties is depression, which several authors regard as a common comorbidity of self-harm (Niu et al., 2024; Rho et al., 2025; Tilton-Weaver & Schwartz-Mette, 2025).

At the same time, numerous studies indicate that self-harm may develop as a maladaptive strategy for coping with psychological distress caused by depressive mood states (Guan et al., 2024), as a consequence of depression that precedes the onset of self-harm, thereby identifying depression as a risk factor for self-harm (Lundh et al., 2011). Conversely, there are studies suggesting that depressive symptoms may arise as a result of psychological, interpersonal, and/or biological changes following repeated episodes of self-harm (Başgöze et al., 2021). Additional variables may further shape the relationship between self-harm and depression. It appears that depression and self-harm may co-occur yet remain independent of one another as consequences of a third factor, or the reciprocal effects of depression and self-harm may be influenced by another phenomenon functioning as a moderator or mediator (see, e.g., Su et al., 2025; Hu et al., 2025).

The list of comorbidities identified thus far in relation to self-harm is extensive—nearly all mental disorders appear within it, including Attention-Deficit/Hyperactivity Disorder (Thornton et al., 2025), Schizophrenia Spectrum Disorders (Lorentzen et al., 2022), Bipolar Disorders (Zhong et al., 2024), Depressive Disorders (Rho et al., 2025), Anxiety Disorders (Shi et al., 2025), Obsessive-Compulsive Disorders (Elango et al., 2025), Trauma- and Stressor-Related Disorders (Huang et al., 2022), Dissociative Disorders (Nester et al., 2022), Feeding and Eating Disorders (Claes & Muehlenkamp, 2014), Impulse-Control and Conduct Disorders (Xie et al., 2025), Substance-Related and Addictive Disorders (Guo et al., 2023), and Personality Disorders (Sadath et al., 2023), among others. Current findings also indicate that certain comorbidities occur with higher prevalence in specific subgroups of individuals who self-harm.

For example, women are characterized by stronger internalizing tendencies compared to men (Liu et al., 2023), and therefore more frequently present with Depressive Disorders (Sabic et al., 2021) or Anxiety Disorders (McLean et al., 2011). Conversely, men are more inclined to externalize their difficulties and show greater tendencies toward Conduct Disorders (Eme, 2007) or Substance-Related and Addictive Disorders (Ellis et al., 2024). Another promising

line of inquiry concerns the relationship between age and the occurrence of comorbidities. It remains unclear whether the number or intensity of comorbidities increases with age among individuals who self-harm—suggesting a potential negative synergistic effect between psychological difficulties and self-harming behavior—or, alternatively, whether self-harm may be conceptualized as a maladaptive coping strategy employed in response to pre-existing psychological difficulties, which subsequently leads to stabilization or even attenuation of symptom severity.

To obtain basic information on the prevalence of the most frequent comorbidities of self-harm in the population, it is necessary to use an appropriate screening method that is, on the one hand, sufficiently sensitive to detect the presence of a given comorbidity, and on the other hand, sufficiently broad to cover the range of disorders that may be associated with self-harm. Psychology possesses several screening instruments for mental disorders (see, e.g., the *DSM-5-TR Self-Rated Level 1 Cross-Cutting Symptom Measure* – APA, 2013b, or the *Brief Symptom Inventory* – Derogatis, 1982); however, selecting the most suitable one requires the availability of data on the current and actual prevalence of psychological difficulties in the self-harming population. Such information would help identify a tool capable of capturing the most frequent problems occurring among individuals who self-harm and subsequently enable the acquisition of relevant data on the comorbidities of self-harm.

## **2. Objective**

The aim of the present study is to provide an overview of the frequency of mental disorders occurring among individuals who engage in self-harm, to determine the presence of gender differences in the occurrence of comorbidities, and to explore the relationship between comorbidity occurrence and age. Given that, within the Slovak population in which the research was conducted, no relevant data currently exist that would allow for the formulation of specific research hypotheses, an exploratory approach was adopted and the following research questions were formulated:

- RQ1: Which comorbidities occur most frequently among individuals who engage in self-harm?
- RQ2: Is the occurrence of comorbidities associated with the age of individuals who engage in self-harm?
- RQ3: Is there a difference in the occurrence of comorbidities among individuals who engage in self-harm depending on gender?

## **3. Method**

### **3.1. Subjects and Procedure**

Data collection was conducted in outpatient practices of clinical psychologists, at workplaces of psychologists and psychiatrists in hospitals and healthcare facilities, as well as among psychologists working in counseling centers and schools. The data collection itself targeted individuals who engage in self-harm and who had previously been under the care of a psychologist/psychiatrist. Anonymous data on the comorbidities of self-harming individuals, along with other relevant information, were provided from their records by the psychologists themselves, who possessed informed consent from their clients. Data were collected using a combined approach: psychologists had the option of completing a paper-and-pencil version of the questionnaire or its electronic version via a QR code generated through the MS Forms platform. Data collection proceeded through convenience sampling based on accessibility and

willingness of the psychologists, followed by a snowball sampling method. Both client data and the psychologists' responses were anonymous.

A total of 137 professionals participated in the survey, comprising clinical psychologists (N = 32), psychiatrists (N = 15), counseling psychologists (N = 51), and school psychologists (N = 37). Two professionals were excluded from the analyses because they were not psychologists (they worked as coaches). Thus, data from 135 professionals were included in the analyses of comorbidities among individuals who self-harm; their mean length of practice was 12.91 years. Each participating psychologist or psychiatrist was instructed to report on one specific self-harming client only, selected from their clinical practice. To minimize the risk of duplicate case reporting (e.g., the same client being reported by more than one clinician), respondents were explicitly asked to choose a case for which they were the primary treating professional. However, because data were collected anonymously, the possibility of duplicate reporting cannot be fully excluded and is discussed in the Limits section. The dataset on individuals who self-harm consisted of 18 men (13.3%), 115 women (85.2%), and two nonbinary individuals (1.5%), ranging in age from 12 to 55 years (M = 18.57; SD = 6.975).

### 3.2. Measures

An anonymous questionnaire was created for psychologists and psychiatrists, consisting of three sections. In the first section, psychologists provided information about themselves (area of professional practice, length of practice). The second section focused on basic characteristics of the described case involving a self-injuring client, including the client's age and gender. The third section consisted of a simple checklist assessing the presence of any mental disorders as defined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition published by the American Psychiatric Association (2013). The complete diagnostic checklist is presented in Table 1.

Table 1. List of monitored comorbidities (according to DSM-5) among individuals who engage in self-harm

- Sleep-Wake Disorders
  - Sexual Dysfunctions
  - Gender Dysphoria
  - Disruptive, Impulse-Control, and Conduct Disorders
  - Substance-Related and Addictive Disorders
  - Neurocognitive Disorders
  - Personality Disorders (Paranoid, Schizoid, Schizotypal, Antisocial, Borderline, Histrionic, Narcissistic, Avoidant, Dependent, Obsessive-Compulsive, and Other Personality Disorders)
  - Paraphilic Disorders
- 
- Relational Problems (in family), Abuse and Neglect, Suicidal Behavior Disorder

In addition to the existing diagnostic categories, two nosological units—“Relational Problems” focused on the family environment and “Abuse and Neglect”—were incorporated from the DSM-5 appendix entitled “Other Conditions That May Be a Focus of Clinical Attention.” Furthermore, the nosological unit “Suicidal Behavior Disorder” was included from the appendix “Emerging Measures and Models,” as prior research has indicated their close association with self-injurious behavior (De Luca et al., 2022; Martin et al., 2016; Başgöze et al., 2021), and the DSM-5 considers these conditions as potential future diagnostic entities. Personality Disorders and Neurodevelopmental Disorders were also assessed at the level of their individual subtypes.

Instruction for psychologists/psychiatrists on rating comorbidities stated: *“Please describe one specific case of self-harm at any age that you have encountered in your practice. We will ask about the presence, or indications of the presence, of additional disorders in line with the DSM-5 structure. [...] Below is a list of diagnoses. Please evaluate the extent to which each diagnosis was present in the case you are describing (whether as a full disorder or only through selected symptoms).”*

For each comorbidity (diagnosis), the evaluator (psychologist or psychiatrist) was given the following response options: 0 = no signs/symptoms; 1 = mild signs/only some symptoms; 2 = suspected diagnosis; 3 = clear/confirmed diagnosis. This made it possible not only to identify the domain of mental/psychiatric difficulties but also to capture the intensity of these problems. If the evaluator was unable to assess the presence of symptoms for a given diagnosis, they were instructed to leave the item blank (i.e., not to answer). A similar rating procedure was used for the additional DSM-5 appendix categories (Relational Problems in the family, Abuse and Neglect, and Suicidal Behavior Disorder): 0 = absent; 1 = mild; 2 = evident; 3 = severe. Each individual diagnosis could therefore receive a score from 0 (absent) to 3 (criteria for the disorder fully met), with intermediate values indicating the number of symptoms suggesting a possible presence of the disorder.

### 3.3. Statistical Processing

For the statistical analysis of the data, the licensed IBM Statistical Product and Service Solutions program (formerly Statistical Package for the Social Sciences) – SPSS – Version 20.0.2.0 – was used. Due to the unequal representation of genders and the results of the Shapiro–Wilk test for the variable age ( $\text{sig.} \leq .001$ ), non-parametric tests were applied in all statistical procedures. To evaluate differences between genders, the Mann–Whitney U test was used, and to examine the association between the occurrence of individual comorbidities and the age of individuals who self-harmed, Spearman’s correlation was employed. The level of statistical significance for all tests was set at the standard value of 0.05 (95%).

### **3.4. Ethical Considerations**

All collected data were anonymous and provided by practicing professionals in psychology and psychiatry. Experts submitted the data in accordance with established standards for the protection of personal data; they participated anonymously and voluntarily and could withdraw from the study at any time without providing a reason and without any consequences. The data collection itself was conducted as part of an approved research project of the Slovak Research and Development Agency of the Ministry of Education, Science, Research and Sports of the Slovak Republic (no. APVV 23-0181) and was also approved by the Ethics Committee of the Faculty of Arts, University of Ss. Cyril and Methodius in Trnava, under registration no. UCM-FF-EK 6/2023.

## **4. Results**

### **4.1. Research Question 1**

Research Question 1 examined which comorbidities occur most frequently among individuals who engage in self-harm. Table 2 presents basic data on the prevalence of individual comorbidities among individuals who self-harm (missing cases were omitted from the frequency analysis).

*Table 2. Prevalence of individual comorbidities among individuals who self-harm*

Comorbidity	N of responses	of which the comorbidity was present	
		N/%	Mean value
Neurodevelopmental Disorders	124	67/54	1.49
Schizophrenia Spectrum and Other Psychotic Disorders	123	8/6.5	0.10
Bipolar and Related Disorders	122	20/16.4	0.20
Depressive Disorders	133	112/84.2	1.68
Anxiety Disorders	133	117/88	1.65
Obsessive-Compulsive and Related Disorders	123	24/19.5	0.26
Trauma- and Stressor-Related Disorders	126	89/70.6	1.21
Dissociative Disorders	124	41/33.1	0.49
Somatic Symptom and Related Disorders	123	46/37.4	0.50
Feeding and Eating Disorders	129	68/52.7	0.98
Elimination Disorders	118	4/3.4	0.03
Sleep-Wake Disorders	122	17/14.5	0.19

Comorbidity	N of responses	of which the comorbidity was present	
		N/%	Mean value
Sexual Dysfunctions	122	8/6.6	0.08
Gender Dysphoria	124	13/10.5	0.19
Disruptive, Impulse-Control, and Conduct Disorders	121	34/28.1	0.45
Substance-Related and Addictive Disorders	129	47/36,4	0.63
Neurocognitive Disorders	118	7/5.9	0.10
Personality Disorders	129	106/82.2	1.44
Paraphilic Disorders	118	3/2.5	0.03
Relational Problems (in family)	133	128/96.2	1.92
Abuse and Neglect	132	51/40.5	0.71
Suicidal Behavior Disorder	133	115/86.5	1.36

Source: Authors

The most frequently occurring problem was Relational Problems (in family), present in 96.2% of cases, followed by Anxiety Disorders (88%) and Suicidal Behavior (86.5%). Depressive Disorders were also relatively common (N = 112; 84.2%). From the category of personality disorders, the most frequently represented was Borderline Personality Disorder (Figure 1), and among the most common neurodevelopmental disorders were Communication Disorder and Attention Deficit Hyperactivity Disorder (Figure 2).

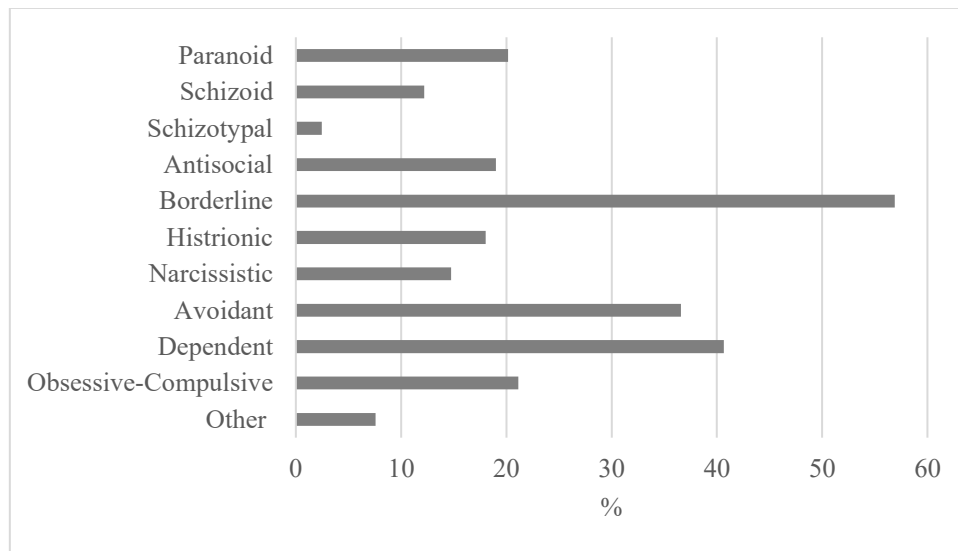


Figure 1. Prevalence of the Personality Disorders in the Sample (in %)

Source: Authors

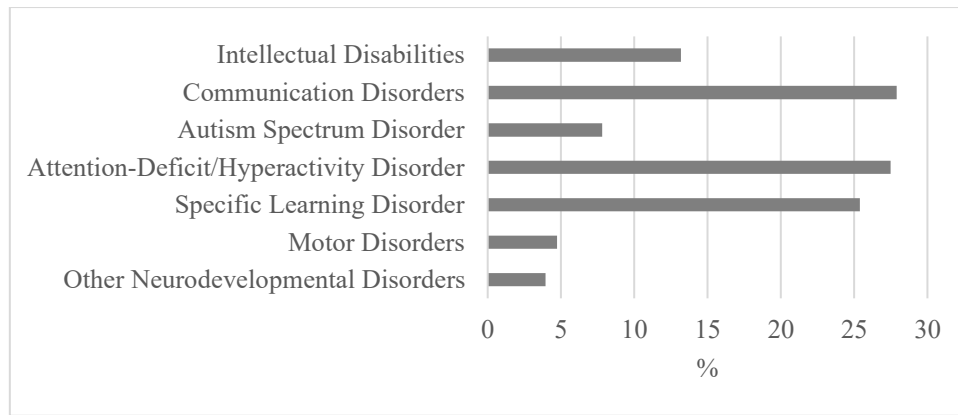


Figure 2. Prevalence of the Neurodevelopmental Disorders in the Sample (in %)

Source: Authors

#### 4.2. Research Question 2

Research Question 2 examined whether the occurrence of comorbidities is related to the age of individuals who self-harm. Spearman’s correlation was used with missing values excluding cases pairwise. The bivariate correlation showed a positive, statistically significant association between age and four areas of comorbidities: Personality Disorders, Depressive Disorders, Substance-Related and Addictive Disorders, and Abuse and Neglect (see Table 3).

Table 3. List of Statistically Significant Correlations between the Age of the Self-harmer and the Occurrence of the Comorbidity (Spearman Correlation)

comorbidity	Age		95% Confidence Intervals	
	Spearman's rho	sig. (2-tailed)	Lower	Upper
Personality Disorders	0.402	<0.001***	0.242	0.541
Depressive Disorders	0.269	0.002**	0.099	0.424
Substance-Related and Addictive Disorders	0.309	<0.001***	0.226	0.533
Abuse and Neglect	0.236	0.007**	0.062	0,395

Source: Authors; Note: \*\*p≤0.01; \*\*\*p≤0.001

Within the Personality Disorders group, a statistically significant correlation was found between age and Dependent Personality Disorder ( $\rho = 0.186$ ;  $p = 0.040$ ; 95% CI [0.004, 0.356]), as well as between age and Borderline Personality Disorder ( $\rho = 0.365$ ;  $p \leq 0.001$ ; 95% CI [0.196, 0.513]).

#### 4.3. Research Question 3

Research Question 3 focused on identifying differences in the occurrence of individual comorbidities among self-harming individuals across sexes. Given that the study objectives included between-sex comparisons, the two non-binary individuals were excluded from these analyses due to their insufficient number to permit meaningful statistical evaluation. Cases with user-missing values were excluded from the analyses. The results of the Mann–Whitney test indicate that differences between males and females were present in five categories of disorders (see Table 4). Within Neurodevelopmental Disorders, the following were found to be sex-specific: Autism Spectrum Disorder ( $U = 757.000$ ;  $p = 0.043$ ), Attention-Deficit/Hyperactivity

Disorder ( $U = 639.000$ ;  $p = 0.015$ ), and Motor Disorders ( $U = 734.000$ ;  $p = 0.006$ ) – all three significantly more prevalent in males).

Table 4. List of Statistically Significant Differences in the Occurrence of the Comorbidities between Sexes (Mann–Whitney U Test)

Comorbidity	Mean Rank		Mann-Whitney U	Asymp. Sig.
	Males	Females		
Neurodevelopmental Disorders	80.22	58.67	548.500	0.016*
Schizophrenia Spectrum and Other Psychotic Disorders	67.74	59.90	769.500	0.047*
Feeding and Eating Disorders	38.29	67.97	1372.00	<0.001** *
Substance-Related and Addictive Disorders	84.15	60.89	592.500	0.005**
Relational Problems (in family)	49.64	68.61	1311.50	0.032*

Source: Authors; Note: \* $p \leq 0.05$ ; \*\* $p \leq 0.01$ ; \*\*\* $p \leq 0.001$

## 5. Discussion

### 5.1. Interpretation of Results

An overview of the occurrence of mental disorders among self-harming individuals clearly shows that all monitored diagnoses (within the DSM-5 structure) were present in the studied sample. When assessing mental health, understanding the interrelations among mechanisms involved in self-harm, as well as when setting up interventions, it is therefore evident that it is extremely important to also focus attention on identifying the presence of other psychological difficulties.

The most frequently occurring area of psychological difficulties associated with self-harm, as reported by mental health professionals, was Relational Problems (in family). Since this is not a diagnosis that can be clearly defined, but rather a proposed nosological unit under the section “Other Conditions That May Be a Focus of Clinical Attention,” it is possible that psychologists and psychiatrists understood it relatively broadly, and thus identified it in the majority of self-harming individuals. Nevertheless, the fact remains that Relational Problems (in family) are reported as a frequent issue in numerous research studies—whether in connection with the nuclear family (i.e., relational problems predominantly during childhood and adolescence—see e.g., Serafini et al., 2017; Waals et al., 2018; Miscioscia et al., 2022) or with the family into which the self-harming individual is integrated in adulthood (Levesque et al., 2010; Carranza et al., 2020). Problems in family relationships may serve as a cause of self-harm—ranging from highly pathological cases such as abuse and neglect (Yang et al., 2025) to less severe parenting errors, for example in the form of high parental demands (Hammond et al., 2025). They may also contribute to the occurrence of self-harm in cases where the family environment does not provide sufficient social support for coping with other psychological difficulties of the child, forcing the individual to seek alternative coping strategies to manage the consequences of these difficulties, which may include the adoption of a maladaptive strategy—self-harm. Family problems may also arise as a consequence of self-harm; when such behavior by a family member is disclosed, it affects all members of the family (Ferrey et al., 2016). It is thus evident that the family environment may display numerous close connections with self-harm.

Among the already established DSM-5 diagnoses, Anxiety Disorders were the most frequently occurring in self-harming individuals. This interconnection can be identified in several theoretical models of self-harm as well as in empirical studies. Anxiety states are accompanied by intense negative emotions, tension, and distress (Amstadter, 2008), as well as states of dissociation (Lofthouse et al., 2023). Thus, in the context of Anxiety Disorders, self-harm may serve the function of affect regulation by diverting attention away from experienced emotions or by masking them with physical pain (Affect Regulation Model – Kuehn et al., 2022), but also by helping to break through feelings of numbness and disconnection (dissociation) (Anti-Dissociation Model – Klonsky, 2007). A close connection between Anxiety Disorders and Self-Harm has been well documented in numerous studies (for a meta-analysis, see e.g., Shi et al., 2025)—whether in the position of anxiety as a predictor (Xiao et al., 2023) or mediator (Chen et al., 2024) of self-harm, or as a consequence of self-harm (Claréus et al., 2025).

Monitoring the relationship between age and the intensity of occurrence of individual comorbidities showed that the occurrence of Personality Disorders, Depressive Disorders, Substance-Related and Addictive Disorders, and psychological difficulties in the area of Abuse and Neglect was statistically significantly associated with age. However, the values of the confidence intervals indicate that generalizing the existence of a relationship between age and Depressive Disorders and Abuse and Neglect must be interpreted with considerable caution, as its presence in other populations is questionable given the low magnitude of the lower bound (less than 0.2). The values of Spearman's correlation coefficient indicate a positive relationship—thus, with increasing age, the occurrence of these difficulties also increases. A statistically significant decrease did not appear in any of the monitored areas. It therefore seems that self-harm is truly a maladaptive strategy for coping with psychological problems not only because of its risky and psychopathological character, but also because it does not, in fact, contribute to improving the mental health of individuals.

The presence of statistically significant associations between age and comorbidities in the studied sample may be attributed to other factors. Self-harm is prevalent predominantly during adolescence and young adulthood; if it persists into later adulthood, it may indicate a lifelong presence of psychological difficulties or a markedly impaired ability to find adaptive solutions to one's problems. In such cases, a higher occurrence of additional mental disorders can be expected. Evidence suggests that when self-harm persists across the lifespan, individuals are highly likely to suffer from at least one additional psychiatric disorder (Liu, 2023). Another explanation for the correlations between age and selected comorbidities among self-harming individuals may lie in the fact that diagnosing comorbidities is, in many cases, complicated during adolescence and young adulthood. A typical example is personality disorders (our analyses demonstrated a statistically significant relationship between age and Dependent and Borderline Personality Disorder). Diagnostic challenges during adolescence or younger adulthood include mainly distinguishing stable personality pathology from normal adolescent instability and identity exploration, the difficulties in applying adult criteria to developing personalities, concerns about stigmatization, and the key fact that personality is still developing at this time (Laurensen et al., 2013). It is therefore possible that some comorbidities were not yet diagnosed at earlier ages.

Differences in the occurrence of individual comorbidities between genders among self-harming individuals must be interpreted with considerable caution, as the research sample was gender-imbalanced (18 men and 115 women). Male gender in the context of self-harm was associated with an increased occurrence of Neurodevelopmental Disorders, Schizophrenia Spectrum and Other Psychotic Disorders, and Substance-Related and Addictive Disorders. For women, Feeding and Eating Disorders and Relational Problems (in family) were more typical. These differences correspond with the general trend of sex/gender differences in the prevalence of

mental disorders documented in the general population—a sex/gender bias toward higher prevalence in males is observed in Neurodevelopmental Conditions (Bölte et al., 2023), Substance-Related and Addictive Disorders (Fonseca et al., 2021), and a tendency toward slightly higher prevalence in men is also present in Schizophrenia Spectrum Disorders (Ferrara et al., 2024). Conversely, women are far more likely than men to suffer from Eating Disorders (Culbert et al., 2021). Data on Relational Problems (in family) are less systematic, as this is not a defined diagnosis yet; however, research findings indicate that women tend to be more engaged in family relationships (García-Mendoza et al., 2022), respond to family-related problems more intensely than men (Skeer et al., 2011), and predominantly internalize problems within family relationships (Blatt-Eisengart et al., 2009). It thus appears that, regarding gender differences in the occurrence of comorbidities, individuals who self-harm may not differ from the non-self-harming population; rather, self-harming individuals seem to follow similar trends as the rest of the population. Our results, however, only suggest this conclusion, as no comparison between self-harming and non-self-harming groups was conducted in this research.

## **5.2. Limitations**

In addition to the aforementioned limitations, several other limitations substantially constrain the inferences that can be drawn from this study. First, the use of convenience and snowball sampling limits representativeness and precludes population-level prevalence estimates. Second, data were based on single-case reports provided by clinicians using an ad hoc, non-validated instrument, which may be subject to reporting bias and variability in diagnostic thresholds. Inter-rater reliability could not be assessed because each case was evaluated by only one professional. Third, missing data were handled by omission, which may have affected prevalence estimates if missingness was systematically related to diagnostic uncertainty. Fourth, the sample exhibited a pronounced gender imbalance, necessitating cautious interpretation of sex differences. Finally, our research did not employ a longitudinal design, and thus the findings related to the association between age and the occurrence of comorbidities may not reflect developmental tendencies present in self-harming individuals.

These findings should be interpreted as preliminary and hypothesis-generating rather than definitive. Despite these limitations, the study provides clinically relevant descriptive data on the breadth of comorbid difficulties observed among self-harming individuals in real-world practice and highlights important directions for future, methodologically rigorous research.

## **6. Conclusion**

The present exploratory study provides a comprehensive descriptive overview of psychiatric comorbidities among individuals engaging in self-harm within Slovak clinical practice. The findings indicate that self-harm rarely occurs in isolation and is typically embedded within a broad constellation of psychological difficulties, most prominently relational problems in the family context, anxiety disorders, depressive disorders, suicidal behavior, and personality pathology. The results further suggest that the occurrence and intensity of selected comorbidities—namely personality disorders, depressive disorders, substance-related and addictive disorders, and experiences of abuse and neglect—are positively associated with age, although the strength and generalizability of some associations require cautious interpretation. Observed sex differences in comorbidity patterns appear to reflect broader epidemiological trends reported in the general population rather than a self-harm-specific profile. Collectively, these findings underscore the clinical necessity of comprehensive, multidimensional assessment procedures that extend beyond the mere identification of self-harming behavior and systematically evaluate co-occurring psychopathology and contextual relational factors. At the

same time, methodological constraints—including non-representative sampling, reliance on clinician-reported single cases, and the cross-sectional design—limit causal inference and generalizability. Future research employing longitudinal, standardized, and population-based methodologies is essential to clarify developmental trajectories and underlying mechanisms linking self-harm with psychiatric comorbidity.

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### **References**

- Al-Sharifi, A., Krynicki, C. R., & Upthegrove, R. (2015). Self-harm and ethnicity: A systematic review. *The International journal of social psychiatry*, 61(6), 600–612. <https://doi.org/10.1177/0020764015573085>
- American Psychiatric Association. (2013a). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Publishing.
- American Psychiatric Association. (2013b). *DSM-5-TR Self-Rated Level 1 Cross-Cutting Symptom Measure*. American Psychiatric Publishing.
- Amstadter, A. (2008). Emotion regulation and anxiety disorders. *Journal of anxiety disorders*, 22(2), 211–221. <https://doi.org/10.1016/j.janxdis.2007.02.004>
- Başgöze, Z., Wiglesworth, A., Carosella, K. A., Klimes-Dougan, B., & Cullen, K. R. (2021). Depression, Non-suicidal Self-injury, and suicidality in adolescents: common and distinct precursors, correlates, and outcomes. *Journal of psychiatry and brain science*, 6(5), e210018. <https://doi.org/10.20900/jpbs.20210018>
- Blatt-Eisengart, I., Drabick, D. A., Monahan, K. C., & Steinberg, L. (2009). Sex differences in the longitudinal relations among family risk factors and childhood externalizing symptoms. *Developmental psychology*, 45(2), 491–502. <https://doi.org/10.1037/a0014942>
- Bölte, S., Neufeld, J., Marschik, P. B., Williams, Z. J., Gallagher, L., & Lai, M. C. (2023). Sex and gender in neurodevelopmental conditions. *Nature reviews. Neurology*, 19(3), 136–159. <https://doi.org/10.1038/s41582-023-00774-6>
- Carranza, A. B., Wallis, C. R. D., Jonnson, M. R., Klonsky, E. D., & Walsh, Z. (2020). Nonsuicidal Self-Injury and Intimate Partner Violence: Directionality of Violence and Motives for Self-Injury. *Journal of Interpersonal Violence*, 886260520922372. <https://doi.org/10.1177/0886260520922372>
- Claes, L., & Muehlenkamp, J. J. (2014). Non-suicidal self-injury and eating disorders: Dimensions of self-harm. In L. Claes & J. J. Muehlenkamp (Eds.), *Non-suicidal self-injury in eating disorders: Advancements in etiology and treatment* (pp. 3–18). Springer-Verlag Publishing/Springer Nature. [https://doi.org/10.1007/978-3-642-40107-7\\_1](https://doi.org/10.1007/978-3-642-40107-7_1)
- Claréus, B., Wångby-Lundh, M., Lundh, L. G., Rådman, G., Bjärehed, J., & Daukantaitė, D. (2025). Predicting adult mental health from non-suicidal self-injury in adolescence: a prospective study spanning 2007-2023. *European child & adolescent psychiatry*, 10.1007/s00787-025-02785-8. Advance online publication. <https://doi.org/10.1007/s00787-025-02785-8>

- Culbert, K. M., Sisk, C. L., & Klump, K. L. (2021). A Narrative Review of Sex Differences in Eating Disorders: Is There a Biological Basis?. *Clinical therapeutics*, 43(1), 95–111. <https://doi.org/10.1016/j.clinthera.2020.12.003>
- De Luca, L., Giletta, M., Menesini, E., & Prinstein, M. J. (2022). Reciprocal associations between peer problems and non-suicidal self-injury throughout adolescence. *Journal of child psychology and psychiatry, and allied disciplines*, 63(12), 1486–1495. <https://doi.org/10.1111/jcpp.13601>
- Derogatis, L. R. (1982). *Brief Symptom Inventory (BSI)* [Database record]. APA PsycTests. <https://doi.org/10.1037/t00789-000>
- Elango, S. C., Sharma, E., & Roopesh, B. N. (2025). Impulsive-addictive-compulsive Types of Non-suicidal Self-injury: A Case Series. *Indian journal of psychological medicine*, 02537176241300760. Advance online publication. <https://doi.org/10.1177/02537176241300760>
- Ellis, R. A., Bailey, A. J., Jordan, C., Shapiro, H., Greenfield, S. F., & McHugh, R. K. (2024). Gender differences in illicit drug access, use and use disorder: Analysis of National Survey on Drug Use and Health data. *Journal of psychiatric research*, 175, 118–122. <https://doi.org/10.1016/j.jpsychires.2024.05.017>
- Eme R. F. (2007). Sex differences in child-onset, life-course-persistent conduct disorder. A review of biological influences. *Clinical psychology review*, 27(5), 607–627. <https://doi.org/10.1016/j.cpr.2007.02.001>
- Ferrara, M., Curtarello, E. M. A., Gentili, E., Domenicano, I., Vecchioni, L., Zese, R., Alberti, M., Franchini, G., Sorio, C., Benini, L., Little, J., Carozza, P., Dazzan, P., & Grassi, L. (2024). Sex differences in schizophrenia-spectrum diagnoses: results from a 30-year health record registry. *Archives of women's mental health*, 27(1), 11–20. <https://doi.org/10.1007/s00737-023-01371-8>
- Ferrey, A. E., Hughes, N. D., Simkin, S., Locock, L., Stewart, A., Kapur, N., Gunnell, D., & Hawton, K. (2016). The impact of self-harm by young people on parents and families: a qualitative study. *BMJ open*, 6(1), e009631. <https://doi.org/10.1136/bmjopen-2015-009631>
- Fonseca, F., Robles-Martínez, M., Tirado-Muñoz, J., Alías-Ferri, M., Mestre-Pintó, J. I., Coratu, A. M., & Torrens, M. (2021). A Gender Perspective of Addictive Disorders. *Current addiction reports*, 8(1), 89–99. <https://doi.org/10.1007/s40429-021-00357-9>
- García-Mendoza, M. C., Parra, A., Sánchez-Queija, I., Oliveira, J. E., & Coimbra, S. (2022). Gender differences in perceived family involvement and perceived family control during emerging adulthood: a cross-country comparison in southern Europe. *Journal of child and family studies*, 31(4), 1007–1018. <https://doi.org/10.1007/s10826-021-02122-y>
- Guan, M., Liu, J., Li, X., Cai, M., Bi, J., Zhou, P., Wang, Z., Wu, S., Guo, L., & Wang, H. (2024). The impact of depressive and anxious symptoms on non-suicidal self-injury behavior in adolescents: a network analysis. *BMC psychiatry*, 24(1), 229. <https://doi.org/10.1186/s12888-024-05599-1>
- Guo, Z., Liu, Y., Wang, C., Li, S., Yu, L., Wu, W., You, X., Zhang, Y., Teng, Z., & Zeng, Y. (2023). Exploring the association of addiction-related genetic factors with non-suicidal self-injury in adolescents. *Frontiers in psychiatry*, 14, 1126615. <https://doi.org/10.3389/fpsy.2023.1126615>
- Hammond, N. G., Semchishen, S. N., Geoffroy, M. C., Sikora, L., Wafy, G., Hsueh, L., Khan, H., Edwards, J., Gravel, C., Ferro, M. A., & Colman, I. (2025). Family dynamics and self-

- harm and suicidality in children and adolescents: a systematic review and meta-analysis. *The lancet. Psychiatry*, 12(9), 660–672. [https://doi.org/10.1016/S2215-0366\(25\)00217-2](https://doi.org/10.1016/S2215-0366(25)00217-2)
- Haregu, T., Chen, Q., Arafat, S. M. Y., Cherian, A., & Armstrong, G. (2023). Prevalence, correlates and common methods of non-suicidal self-injury in South Asia: a systematic review. *BMJ open*, 13(11), e074776. <https://doi.org/10.1136/bmjopen-2023-074776>
- Hu, J. T., Cao, Y., Liu, L. L., Wang, D., Zhu, P., Du, X., Ji, F., Peng, R. J., Tian, Q., & Zhu, F. (2025). Adolescent non-suicidal self-injury: The moderating influence of social support utilization on depression. *World journal of psychiatry*, 15(6), 106017. <https://doi.org/10.5498/wjp.v15.i6.106017>
- Huang, C., Yuan, Q., Ge, M., Sheng, X., Yang, M., Shi, S., Cao, P., Ye, M., Peng, R., Zhou, R., Zhang, K., & Zhou, X. (2022). Childhood trauma and Non-suicidal Self-injury among chinese adolescents: the mediating role of psychological sub-health. *Frontiers in psychiatry*, 13, 798369. <https://doi.org/10.3389/fpsyt.2022.798369>
- Chen, X. C., Xu, J. J., Yin, X. T., Qiu, Y. F., Yang, R., Wang, Z. Y., Han, Y. W., Wang, Q. K., Zhai, J. H., Zhang, Y. S., Ran, M. S., & Hu, J. M. (2024). Mediating role of anxiety and impulsivity in the association between child maltreatment and lifetime non-suicidal self-injury with and without suicidal self-injury. *Journal of affective disorders*, 347, 57–65. <https://doi.org/10.1016/j.jad.2023.11.080>
- Klonsky, E. D. (2007). The functions of deliberate self-injury: a review of the evidence. *Clinical psychology review*, 27(2), 226–239. <https://doi.org/10.1016/j.cpr.2006.08.002>
- Kuehn, K. S., Dora, J., Harned, M. S., Foster, K. T., Song, F., Smith, M. R., & King, K. M. (2022). A meta-analysis on the affect regulation function of real-time self-injurious thoughts and behaviours. *Nature human behaviour*, 6(7), 964–974. <https://doi.org/10.1038/s41562-022-01340-8>
- Laurensen, E. M., Hutsebaut, J., Feenstra, D. J., Van Busschbach, J. J., & Luyten, P. (2013). Diagnosis of personality disorders in adolescents: a study among psychologists. *Child and adolescent psychiatry and mental health*, 7(1), 3. <https://doi.org/10.1186/1753-2000-7-3>
- Levesque, C., Lafontaine, M. F., Bureau, J. F., Cloutier, P., & Dandurand, C. (2010). The influence of romantic attachment and intimate partner violence on non-suicidal self-injury in young adults. *Journal of youth and adolescence*, 39(5), 474–483. <https://doi.org/10.1007/s10964-009-9471-3>
- Lim, K. S., Wong, C. H., McIntyre, R. S., Wang, J., Zhang, Z., Tran, B. X., Tan, W., Ho, C. S., & Ho, R. C. (2019). Global lifetime and 12-month prevalence of suicidal behavior, deliberate self-harm and Non-suicidal Self-injury in children and adolescents between 1989 and 2018: a meta-analysis. *International journal of environmental research and public health*, 16(22), 4581. <https://doi.org/10.3390/ijerph16224581>
- Liu, K., Thompson, R. C., Watson, J., Montena, A. L., & Warren, S. L. (2023). Developmental trajectories of internalizing and externalizing symptoms in youth and associated gender differences: a directed network perspective. *Research on child and adolescent psychopathology*, 51(11), 1627–1639. <https://doi.org/10.1007/s10802-023-01106-4>
- Liu, R. T. (2017). Characterizing the course of non-suicidal self-injury: A cognitive neuroscience perspective. *Neuroscience and biobehavioral reviews*, 80, 159–165. <https://doi.org/10.1016/j.neubiorev.2017.05.026>
- Liu, R. T. (2023). The epidemiology of non-suicidal self-injury: lifetime prevalence, sociodemographic and clinical correlates, and treatment use in a nationally representative

- sample of adults in England. *Psychological medicine*, 53(1), 274–282. <https://doi.org/10.1017/S003329172100146X>
- Lofthouse, M. K., Waite, P., & Černis, E. (2023). Developing an understanding of the relationship between anxiety and dissociation in adolescence. *Psychiatry research*, 324, 115219. <https://doi.org/10.1016/j.psychres.2023.115219>
- Lorentzen, E. A., Mors, O., & Kjær, J. N. (2022). The prevalence of self-injurious Behavior in patients with schizophrenia spectrum disorders: a systematic review and meta-analysis. *Schizophrenia bulletin open*, 3(1), sgac069. <https://doi.org/10.1093/schizbullopen/sgac069>
- Lundh, L. G., Wångby-Lundh, M., Paaske, M., Ingesson, S., & Bjärehed, J. (2011). Depressive symptoms and deliberate self-harm in a community sample of adolescents: a prospective study. *Depression research and treatment*, 2011, 935871. <https://doi.org/10.1155/2011/935871>
- Martin, J., Bureau, J. F., Yurkowski, K., Fournier, T. R., Lafontaine, M. F., & Cloutier, P. (2016). Family-based risk factors for non-suicidal self-injury: Considering influences of maltreatment, adverse family-life experiences, and parent-child relational risk. *Journal of adolescence*, 49, 170–180. <https://doi.org/10.1016/j.adolescence.2016.03.015>
- McLean, C. P., Asnaani, A., Litz, B. T., & Hofmann, S. G. (2011). Gender differences in anxiety disorders: prevalence, course of illness, comorbidity and burden of illness. *Journal of psychiatric research*, 45(8), 1027–1035. <https://doi.org/10.1016/j.jpsychires.2011.03.006>
- Miscioscia, M., Angelico, C., Raffagnato, A., & Gatta, M. (2022). Psychopathological and interactive-relational characteristics in Non-suicidal Self-injury adolescent outpatients. *Journal of clinical medicine*, 11(5), 1218. <https://doi.org/10.3390/jcm11051218>
- Nester, M. S., Boi, C., Brand, B. L., & Schielke, H. J. (2022). The reasons dissociative disorder patients self-injure. *European journal of psychotraumatology*, 13(1), 2026738. <https://doi.org/10.1080/20008198.2022.2026738>
- Niu, S., Yin, X., Pan, B., Chen, H., Dai, C., Tong, C., Chen, F., & Feng, X. (2024). Understanding comorbidity between Non-suicidal Self-injury and depressive symptoms in a clinical sample of adolescents: a network analysis. *Neuropsychiatric disease and treatment*, 20, 1–17. <https://doi.org/10.2147/NDT.S443454>
- Oppenheimer, C. W., Glenn, C. R., & Miller, A. B. (2022). Future directions in suicide and self-injury revisited: integrating a developmental psychopathology. *Perspective. Journal of clinical child and adolescent psychology : the official journal for the Society of Clinical Child and Adolescent Psychology, American Psychological Association, Division 53*, 51(2), 242–260. <https://doi.org/10.1080/15374416.2022.2051526>
- Rho, M. J., Won, Y. J., Lim, H. S., & Boo, Y. K. (2025). Mental and behavioral disorders, comorbidity, and self-harm: results from Korea National Hospital Discharge In-Depth Injury Survey. *Psychiatry investigation*, 22(4), 462–474. <https://doi.org/10.30773/pi.2024.0301>
- Richardson, R., Connell, T., Foster, M., Blamires, J., Keshoor, S., Moir, C., & Zeng, I. S. (2024). Risk and protective factors of self-harm and suicidality in adolescents: an umbrella review with meta-analysis. *Journal of youth and adolescence*, 53(6), 1301–1322. <https://doi.org/10.1007/s10964-024-01969-w>

- Rubæk, L., & Møhl, B. (2024). Direct and indirect self-injury. In E. E. Lloyd-Richardson, I. Baetens, & J. L. Whitlock (Eds.), *The Oxford handbook of nonsuicidal self-injury* (pp. 41-71). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780197611272.013.4>
- Sabic, D., Sabic, A., & Bacic-Becirovic, A. (2021). Major depressive disorder and difference between genders. *Materia socio-medica*, 33(2), 105–108. <https://doi.org/10.5455/msm.2021.33.105-108>
- Sadath, A., Troya, M. I., Nicholson, S., Cully, G., Leahy, D., Ramos Costa, A. P., Benson, R., Corcoran, P., Griffin, E., Phillip, E., Cassidy, E., Jeffers, A., Shiely, F., Alberdi-Páramo, Í., Kavalidou, K., & Arensman, E. (2023). Physical and mental illness comorbidity among individuals with frequent self-harm episodes: A mixed-methods study. *Frontiers in psychiatry*, 14, 1121313. <https://doi.org/10.3389/fpsy.2023.1121313>
- Serafini, G., Canepa, G., Adavastro, G., Nebbia, J., Belvederi Murri, M., Erbuto, D., Pocai, B., Fiorillo, A., Pompili, M., Flouri, E., & Amore, M. (2017). The relationship between childhood maltreatment and non-suicidal self-injury: a systematic review. *Frontiers in psychiatry*, 8, 149. <https://doi.org/10.3389/fpsy.2017.00149>
- Shi, J., Gao, P., Zhou, B., & Huang, Z. (2025). A meta-analysis of the relationship between anxiety and non-suicidal self-injury based on knowledge graphs. *Frontiers in psychiatry*, 15, 1493823. <https://doi.org/10.3389/fpsy.2024.1493823>
- Skeer, M. R., McCormick, M. C., Normand, S. L., Mimiaga, M. J., Buka, S. L., & Gilman, S. E. (2011). Gender differences in the association between family conflict and adolescent substance use disorders. *The Journal of adolescent health : official publication of the Society for Adolescent Medicine*, 49(2), 187–192. <https://doi.org/10.1016/j.jadohealth.2010.12.003>
- Skrivankova, V. W., Rabie, S., Tlali, M., Folb, N., Chinogurei, C., Bennett, S., Wesso, A., Ruffieux, Y., Cornell, M., Seedat, S., Egger, M., Davies, M. A., Maartens, G., Joska, J., & Haas, A. D. (2025). Incidence and prognostic factors of self-harm and subsequent unnatural death in South Africa: A cohort study. *PLoS medicine*, 22(9), e1004765. <https://doi.org/10.1371/journal.pmed.1004765>
- Steinhoff, A., Ribeaud, D., Kupferschmid, S., Raible-Destan, N., Quednow, B. B., Hepp, U., Eisner, M., & Shanahan, L. (2021). Self-injury from early adolescence to early adulthood: age-related course, recurrence, and services use in males and females from the community. *European child & adolescent psychiatry*, 30(6), 937–951. <https://doi.org/10.1007/s00787-020-01573-w>
- Su, W., Liu, H., Zhou, X., & Huang, X. (2025). Depression and non-suicidal self-injury: the mediating roles of childhood trauma and impulsivity. *Frontiers in psychiatry*, 16, 1580235. <https://doi.org/10.3389/fpsy.2025.1580235>
- Thornton, K. E., Wiggs, K. K., Epstein, J. N., Tamm, L., & Becker, S. P. (2025). ADHD and cognitive disengagement syndrome symptoms related to self-injurious thoughts and behaviors in early adolescents. *European child & adolescent psychiatry*, 34(3), 1195–1206. <https://doi.org/10.1007/s00787-024-02556-x>
- Tilton-Weaver, L., & Schwartz-Mette, R. (2025). Non-suicidal Self-injury and depressive symptoms during adolescence: testing directionality. *Journal of youth and adolescence*, 54(9), 2168–2179. <https://doi.org/10.1007/s10964-025-02183-y>

- Tørmoen, A. J., Rossow, I., Larsson, B., & Mehlum, L. (2013). Nonsuicidal self-harm and suicide attempts in adolescents: differences in kind or in degree?. *Social psychiatry and psychiatric epidemiology*, 48(9), 1447–1455. <https://doi.org/10.1007/s00127-012-0646-y>
- Victor, S. E., Muehlenkamp, J. J., Hayes, N. A., Lengel, G. J., Styer, D. M., & Washburn, J. J. (2018). Characterizing gender differences in nonsuicidal self-injury: evidence from a large clinical sample of adolescents and adults. *Comprehensive psychiatry*, 82, 53–60. <https://doi.org/10.1016/j.comppsy.2018.01.009>
- Waals, L., Baetens, I., Rober, P., Lewis, S., Van Parys, H., Goethals, E. R., & Whitlock, J. (2018). The NSSI family distress cascade theory. *Child and adolescent psychiatry and mental health*, 12, 52. <https://doi.org/10.1186/s13034-018-0259-7>
- Wiggin, D., Ní Dhálaigh, D., McMahon, E., McNicholas, F., & Griffin, E. (2025). Age of onset of self-harm in children and adolescents: a scoping review. *Child and adolescent psychiatry and mental health*, 19(1), 128. <https://doi.org/10.1186/s13034-025-00982-6>
- Xiao, Q., Song, X., Huang, L., Hou, D., & Huang, X. (2023). Association between life events, anxiety, depression and non-suicidal self-injury behavior in Chinese psychiatric adolescent inpatients: a cross-sectional study. *Frontiers in psychiatry*, 14, 1140597. <https://doi.org/10.3389/fpsy.2023.1140597>
- Xie, Y., Wu, S., Li, J., Zhang, C., Zhang, Y., Hang, Y., Lang, N., Lv, Z., Zhang, P., Liang, M., Yu, B., Long, J., Liu, Y., Wang, S., Ouyang, L., Zhang, L., Wu, Y., & Wang, C. (2025). Impulse control deficits among patients with nonsuicidal self-injury: a mediation analysis based on structural imaging. *Journal of psychiatry & neuroscience : JPN*, 50(2), E73–E84. <https://doi.org/10.1503/jpn.240129>
- Yang, L., Du, X., & Huang, M. (2025). Childhood maltreatment and non-suicidal self-injury: the mediating role of mentalization and depression. *European journal of psychotraumatology*, 16(1), 2466279. <https://doi.org/10.1080/20008066.2025.2466279>
- Zhong, R., Wang, Z., Zhu, Y., Wu, X., Wang, X., Wu, H., Zhou, J., Li, X., Xu, G., Pan, M., Chen, Z., Li, W., Jiao, Z., Li, M., Zhang, Y., Chen, J., Chen, X., Li, N., Sun, J., Zhang, J., ... Fang, Y. (2024). Prevalence and correlates of non-suicidal self-injury among patients with bipolar disorder: A multicenter study across China. *Journal of affective disorders*, 367, 333–341. <https://doi.org/10.1016/j.jad.2024.08.231>