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Article

Predictors of Suicide Attempt in Paediatric Patients with Non-Suicidal Self-Injury

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Abstract

Non-suicidal self-injury (NSSI) is a significant mental health issue among children and adolescents, characterized by deliberate, self-inflicted harm to body tissue without suicidal intent. NSSI is a robust predictor of later suicide attempts and is commonly linked to various psychiatric comorbidities. Ongoing debate concerns whether NSSI and suicidal behavior should be classified as separate entities or as points along a continuum of self-harm. The continuum perspective underscores the necessity of identifying risk factors that contribute to progression from NSSI to suicidal behavior. This paper reviews current literature on Non-Suicidal Self-Injury (NSSI) and introduces a research project aimed at identifying predictors of transition from NSSI to Suicidal Self-Injurious Behaviour (SSIB) in clinical adolescent populations. The primary objective is to inform the development of early preventive interventions. The study will use a longitudinal design, enrolling adolescents aged 13 to 17 years from primary care and child psychiatry clinics. Eligibility requires meeting the proposed Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria for Non-Suicidal Self-Injury (NSSI). The protocol includes structured interviews such as the Self-Injurious Thoughts and Behaviors Interview (SITBI) and the Suicide Attempt Self-Injury Interview (SASII), as well as self-report instruments including the Suicidal Behaviors Questionnaire-Revised (SBQ-R), Children's Depression Inventory 2 (CDI-2), Difficulties in Emotion Regulation Scale (DERS), and Youth Self-Report (YSR). These tools will assess self-injury, suicidality, emotional symptoms, emotion regulation, and overall functioning. Assessments will occur at baseline and at 1, 3, and 6 months to monitor changes in risk and resilience. Recognizing Non-Suicidal Self-Injury (NSSI) as part of a continuum of psychopathological development is essential for clinical practice. The anticipated findings from this research may validate NSSI diagnostic criteria, identify critical risk markers for escalation to suicidal behavior, and support the creation of more effective, individualized screening, prevention, and treatment strategies. These advances aim to reduce morbidity and mortality among vulnerable adolescents.

Keywords: non-suicidal self-injury (NSSI); pediatrics/child and adolescent psychiatry; suicide attempt (SA); risk factors

Introduction

Nonsuicidal Self-Injury (NSSI), is defined as the intentional destruction of one's own body tissue without apparent or conscious suicidal intent and for purposes not socially sanctioned. Socially sanctioned behaviors, such as piercings, tattoos, and religious rituals, are excluded from this definition (American Psychiatric Association, 2013). Indirect or accidental behaviors, including substance abuse or eating disorders, are also excluded. Due to associated stigma, NSSI is frequently concealed. Empirical evidence supporting the independent diagnosis of NSSI includes its high prevalence, significant psychosocial impact, clear distinction from suicidal behavior, and

transdiagnostic characteristics (Gill et al., 2023). NSSI may occur in young individuals without psychiatric diagnoses and is distinct from other psychiatric disorders.

Empirical studies indicate that children and adolescents who engage in NSSI are at increased risk for subsequent suicidal behavior (Chen et al., 2023). A prospective cohort study demonstrated that adolescents with a history of NSSI are more likely to attempt suicide compared to peers without such behaviors (Whitlock, 2010). NSSI frequently co-occurs with psychiatric disorders, including major depressive disorder, anxiety disorders, and substance use disorders. The presence of these comorbidities elevates the risk of adverse psychosocial outcomes during childhood and adolescence (Gill et al., 2024).

Moreover, NSSI frequently co-occurs with a range of psychiatric disorders, including anxiety disorders, depressive disorders, eating disorders, and substance use disorders, thereby compounding the risk of adverse psychosocial outcomes in affected youth (Gill et al., 2024).

Nonsuicidal Self-Injury most frequently begins in early to mid-adolescence, typically between ages 12 and 16, with prevalence declining in later adolescence and adulthood (Whitlock, 2010). Research identifies significant gender differences in NSSI, with higher rates observed among females (Zhou et al., 2023). Among adolescents aged 12 to 15, studies report a female-to-male ratio of approximately 5 to 6 to 1 (Sornberger et al., 2012). Cutting is the most commonly reported method of self-injury among adolescents. Additional methods include self-hitting, biting, hair-pulling, and causing blunt trauma, such as striking against walls or sharp objects (American Academy of Child and Adolescent Psychiatry, 2019).

Female adolescents more frequently engage in self-injury methods that involve blood, such as cutting (Sornberger et al., 2012). In contrast, male adolescents more commonly exhibit behaviors resulting in trauma through physical altercations or self-inflicted burns (PACESConnection, 2012).

The most affected body areas are those that are easily accessible and concealable, including the arms, wrists, thighs, and abdomen.

Ongoing debates within the scholarly community reflect divergent perspectives on the conceptual boundaries of NSSI, particularly in relation to suicidal behaviors. Proponents of a categorical distinction maintain that NSSI is characterized by unique social, demographic, and clinical profiles that differentiate it from behaviors with suicidal intent. This perspective informed the decision to include NSSI in Section III of the DSM-5, designating it as a condition warranting further empirical investigation (American Psychiatric Association, 2013).

However, this dichotomous approach has been subject to substantial critique. Opponents argue that strict separation may obscure the complex interplay between self-injurious behaviors and suicidality, potentially minimizing the transitional risks posed by NSSI. Empirical studies have highlighted the fluidity of self-injurious behaviors, suggesting significant overlap in underlying risk factors and pathways.

These critics advocate for a dimensional or continuum-based framework that situates both nonsuicidal and suicidal self-injury within a broader spectrum of self-harm, thereby facilitating a more comprehensive understanding of their etiologies and implications for prevention and intervention.

Conceptualizing NSSI and suicidal behavior as existing along a continuum, consistent with the heterotypic psychopathological development framework, highlights critical implications for clinical and community practice. Specifically, this perspective necessitates systematic early screening and risk assessment protocols to facilitate prompt identification of individuals engaging in NSSI. Implementation of evidence-based interventions at initial stages can reduce the likelihood of escalation to suicidal behavior or completed suicide. Furthermore, these findings call for the development of integrated prevention strategies that encompass both clinical settings and community-based initiatives, aiming to address the multifactorial determinants of NSSI and to diminish its long-term psychosocial impact across diverse populations.

Diagnosis

In 2013, Non-Suicidal Self-Injury (NSSI) was included in Section III of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as a Condition for Further Study (American Psychiatric Association, 2013). Recent literature proposes that NSSI may constitute a distinct syndrome (Gill et al., 2023). Nevertheless, NSSI is not recognized as an official diagnosis in the DSM-5.

To facilitate the systematic study and possible clinical identification of NSSI, the DSM-5 specifies a set of proposed diagnostic criteria. The following section summarizes these criteria, all of which are required for a diagnosis of NSSI (American Psychiatric Association, 2013).

The self-injurious behavior must be intentional, resulting in damage to the body's surface, and occur on five or more days within the past year without suicidal intent. Examples of NSSI include cutting, burning, stabbing, or hitting oneself, with the expectation that injuries will be mild to moderate in severity (Whitlock, 2010).

The absence of suicidal intent is either explicitly reported by the individual or inferred from repeated engagement in self-injurious acts with the knowledge that these actions are unlikely to be fatal.

Additionally, the individual must expect to achieve at least one of the following outcomes during or shortly after self-injury (American Psychiatric Association, 2013): relief from negative emotions or thoughts, resolution of an interpersonal problem, or the generation of a positive feeling.

For a diagnosis of NSSI, the self-injurious behavior must also be accompanied by at least one of the following associated features:

Persistent cognitions concerning engagement in self-injurious behavior, regardless of whether these thoughts result in actual acts of self-injury

Preoccupation with the behavior that is difficult to resist before engaging in self-injury

Immediately before the behavior, individuals experience interpersonal difficulties, negative emotions such as anger, anxiety, depression, or hopelessness, or negative thoughts including self-criticism or suicidal ideation (Chen et al., 2023; Gill et al., 2024)

The self-injurious behaviour is not socially acceptable and goes beyond picking wounds or nail-biting. Behaviours such as piercings, tattoos, or participation in religious or cultural rituals are specifically excluded from the definition of NSSI (American Psychiatric Association, 2013).

The behaviour causes significant distress or interferes with important areas of life, such as social or academic functioning (American Academy of Child and Adolescent Psychiatry, 2019). The self-injurious behaviour is not better explained by another mental disorder or a medical condition such as Autism Spectrum Disorder or Lesch-Nyhan syndrome. It is not part of a pattern of repetitive stereotypies in patients with a Neurodevelopmental Disorder and does not occur exclusively during psychosis, delirium, or substance intoxication or withdrawal (American Psychiatric Association, 2013).

Functions of and Risk Factors for Non-Suicidal Self-Injury

Clinical Assessment of NSSI

A comprehensive assessment during a Child and Adolescent Psychiatry consultation must systematically address contextual and clinical factors contributing to the onset and progression of non-suicidal self-injury (NSSI). Key domains for evaluation include the severity and chronicity of self-injurious behaviors, presence of suicidal ideation and maladaptive personality traits, psychiatric history, self-perception, attitudes toward achievement and fulfilment, recent and past life events, and the quality of interpersonal relationships (American Psychiatric Association, 2013). The following sections provide a detailed overview of each assessment domain.

- Severity and chronicity of the behaviours
- Presence of suicidal ideation and maladaptive personality traits

- Recent and past negative and positive life events
- Personal psychiatric history
- The adolescent's self-perception and their attitudes towards success and personal fulfilment
- The nature of their interpersonal relationships and attitudes towards family and others.

Functions of NSSI

Non-suicidal self-injury (NSSI) serves both interpersonal and intrapersonal functions, where in interpersonal functions refer to behaviors intended to influence, communicate with, or elicit responses from others, and intrapersonal functions involve self-directed actions that regulates internal emotional states or alleviate psychological distress (Chen et al., 2023; Gill et al., 2024).

Regarding interpersonal functions, these include:

Boundary Assertion: Affirming one's own identity and creating a distinction between the self and others.

Interpersonal Influence: Engaging in NSSI to solicit support or attention from others, such as when adolescents disclose self-injurious behavior to elicit concern from caregivers or teachers.

For example, the author Muehlenkamp et al. (2012) found that some individuals use NSSI as a means of communicating psychological distress when verbal communication proves inadequate or ineffective.

- **Sensation Seeking:** Generating excitement or euphoria.
- **Peer Bonding:** Adapting to others or feeling close to peers.

Other functions include revenge, creating a reason for self-care, or testing endurance (Chen et al., 2023; Gill et al., 2024).

On the other hand, **Intrapersonal** functions include:

- **Affect Regulation:** which involves managing overwhelming emotions.
- **Anti-Dissociation:** Used to terminate experiences of depersonalisation or dissociation.
- **Anti-Suicide:** Acting to curb the impulse to commit a suicide attempt or to relieve passive death wishes or active suicidal ideation.
- **Creating a Physical Signal:** Making a tangible mark of a distressing or negative emotion.
- **Self-Punishment:** Inflicting injury as a form of self-directed reprisal (Chen et al., 2023; Gill et al., 2024).

Risk Factors for Non-Suicidal Self-Injury

The extent to which socioeconomic status constitutes an independent risk factor remains contested within the literature, with some studies reporting no significant association after controlling for confounding variables (Brunner et al., 2014). Thus, while certain demographic patterns emerge, the universality of NSSI across socioeconomic strata highlights the complexity and ongoing debate regarding these risk factors. Risk factors associated with non-suicidal self-injury (NSSI) are multifaceted and encompass demographic, psychological, and environmental variables (Non-suicidal Self-Injury in Adolescence, 2017).

Demographic and socio-educational variables, such as female sex and lower socioeconomic and educational status, have been frequently identified as risk factors for NSSI in adolescents. (Non-suicidal Self-Injury in Adolescence, 2017).

Nevertheless, empirical evidence indicates that NSSI is not confined to these groups and can be observed across diverse socioeconomic backgrounds (Plener et al., 2015).

In interpersonal relationships, significant factors include family conflict, parental separation or divorce, parental death, family mental illness, and a family history of suicidal behaviours. (Wagner et al., 2003). Concerning negative life events, a history of physical/sexual abuse, psychological/emotional neglect, as well as bullying or other traumatic childhood experiences, is a

prominent risk factor. (Liu et al., 2022, pp. 1-9). Personal mental illness factors include Depression, Anxiety, ADHD, eating disorders, and substance abuse (Che et al., 2022). Impulsivity, aggressiveness, and difficulty with emotional regulation or problem-solving also play a role in this kind of cases (De Stefano & Taurino, 2025). Children and adolescents exhibiting high impulsivity often engage in non-suicidal self-injury (NSSI) as a maladaptive coping strategy to achieve immediate relief from negative emotional states.

Children and adolescents who engage in NSSI often demonstrate pronounced deficits in emotional regulation, which manifest as heightened emotional dysregulation. (De Stefano & Taurino, 2025).

Furthermore, characteristics such as low self-esteem, a perfectionistic temperament, self-deprecating tendencies, alexithymia, and pervasive hopelessness significantly increase vulnerability to NSSI. (Schmidt & Iyer, 2025).

These psychological factors not only predispose individuals to self-injurious behaviors but also may perpetuate NSSI through their negative impact on coping capacity, highlighting the interconnectedness of affective dysregulation and maladaptive self-concept in the etiology and maintenance of NSSI. Other risk factors include social contagion, previous NSSI, or a history of suicidal thoughts or attempts. (Sornberger et al., 2020). ADHD symptoms are also associated with increased NSSI risk in adolescents, particularly girls (Balázs et al., 2018).

Treatment

Mentalisation-based psychotherapy constitutes a primary treatment modality. Its objective is to restore the individual's capacity for self-reflection and to distinguish between internal psychological experiences and external reality. This therapeutic process enables the identification and reframing of emotional responses, thereby improving emotional understanding, self-regulation, self-esteem, and self-confidence.

Cognitive Behavioural Therapy (CBT) represents a foundational treatment approach. CBT is based on the premise that non-suicidal self-injury (NSSI) constitutes a maladaptive coping mechanism reinforced by its capacity to reduce psychological distress. This therapy employs a structured, goal-oriented process to address NSSI by targeting the cognitive and behavioural mechanisms that perpetuate the behaviour (Nogueira, Cunha & Krupskyi, 2025).

The therapeutic process typically includes the following components:

Functional Analysis: The therapist and client collaboratively identify the sequence of events, cognitions, and emotions that precipitate the urge to engage in self-injury. This process clarifies the specific function that non-suicidal self-injury (NSSI) serves for the individual, such as alleviating overwhelming anxiety or self-punishment for perceived failures.

Cognitive Restructuring: Clients are taught to identify, challenge, and modify distorted or negative automatic thoughts that contribute to emotional distress, such as beliefs of worthlessness or the perception that pain is necessary to alleviate numbness. Reframing these cognitions reduces the emotional intensity that drives the urge to self-injure.

Skills Training: An essential component involves providing clients with alternative, adaptive coping strategies to replace non-suicidal self-injury (NSSI).

These strategies include the following:

Emotion Regulation Skills: These are strategies for identifying, tolerating, and managing intense emotions like anger, shame, or anxiety. They help clients avoid resorting to self-harm.

Distress Tolerance Skills: These techniques assist clients in enduring and accepting periods of acute psychological distress without exacerbating the situation. Examples include distraction, self-soothing, and strategies to improve the immediate experience.

Problem-Solving Skills: Clients are taught to decompose complex problems into smaller, manageable steps, which reduces feelings of helplessness.

Dialectical Behaviour Therapy (DBT) is a specialised form of CBT originally developed for Borderline Personality Disorder. It is particularly effective for complex and high-risk NSSI. DBT

strongly emphasises validating the client's emotional experience while teaching behavioural skills in four key areas: mindfulness, distress tolerance, emotion regulation, and interpersonal effectiveness (Nogueira, Cunha & Krupskyi, 2025).

Family Therapy is frequently recommended, particularly for adolescents. This intervention addresses dysfunctional family dynamics, enhances communication, and fosters a supportive home environment. Such support reinforces the skills acquired during individual therapy.

The treatment of non-suicidal self-injury (NSSI) must address any comorbid psychiatric disorders (e.g., depression, anxiety, PTSD). Psychopharmacological interventions are used to manage underlying symptoms. Psychotherapeutic interventions help build lasting coping strategies. The treatment plan is tailored to the severity and complexity of the presentation (Nogueira, Cunha & Krupskyi, 2025).

Research Project Line

Background and Aims

Drawing on existing literature, this project seeks to **validate diagnostic criteria for Non-Suicidal Self-Injury (NSSI)**, conceptualized as part of a continuum of psychopathological development leading to Suicidal Self-Injurious Behaviour (SSIB).

The **primary objective** is to identify factors that predict the transition from NSSI to SSIB in a clinical adolescent population. The **overarching goal** is to enable early preventive interventions targeting these factors to reduce and potentially prevent progression to Suicide Attempt (SA).

Sample

Recruitment will be conducted in two settings:

- Primary healthcare centres, utilizing the portuguese version of the **Suicidal Behaviours Questionnaire-Revised (SBQ-R)**, the **Suicide Risk Screening Tool**, and the **ULSB Paediatric Psychiatry Department**, through referrals from the paediatric emergency service.
- Child and Adolescent Psychiatry Referrals (Patients referred to the ULNB Paediatric Psychiatry Department via the Paediatric Emergency Service).

Participants are required to meet the screening protocol outlined in Annexe 1 and provide informed consent.

Inclusion criteria are as follows

- Aged between 13 and 17 years.
- Participants must be receiving follow-up care at the ULNB Paediatric Psychiatry Department and must not require acute inpatient admission at the time of recruitment.
- Participants must fulfill the diagnostic criteria for Non-Suicidal Self-Injury (NSSI) as specified in the study protocol.
- Participants are required to demonstrate sufficient communication skills, as determined by the research team. Participants must not have a comorbid cognitive deficit, confirmed using standard clinical assessments.
- Participants may be receiving psychopharmacological treatment at the time of recruitment or may not be undergoing such treatment.
- Participants may have comorbid psychiatric diagnoses or may participate without such. Participants may present with comorbid psychiatric diagnoses or may participate without any comorbidities, among adolescents receiving standard care, including treatment for comorbidities and psychotherapeutic interventions.

A Rigorous Psychometric Protocol

Capturing the Trajectory of Risk and Resilience

To surpass subjective clinical impressions and obtain robust data, this study employs a multi-informant psychometric protocol.

The longitudinal design monitors participants and systematically examines the interactions among self-injury, emotional symptoms, and overall functioning.

A Collaborative Clinical Assessment

The attending Child and Adolescent Psychiatrist will administer all scales and conduct interviews during clinical consultations. A trained Clinical Psychologist will score the results and provide expert analysis. This two-clinician approach enhances data reliability. All procedures will adhere to the approved ethics protocol.

Mapping the Journey

A Multi-Wave Assessment Strategy

The Baseline Assessment (Initial Consultation)

The initial evaluation establishes a comprehensive psychometric profile for each adolescent. It documents the presence, frequency, intentionality, and purpose of self-injury, as well as concurrent suicidal ideation and emotional difficulties.

Structured Interviews

Leading instruments such as the Self-Injurious Thoughts and Behaviors Interview (SITBI) and the Self-Injurious Acts and Suicidal Intent Interview (SASII) provide in-depth qualitative data on self-injurious behaviors and their context.

Self-Report Measures

A set of validated portuguese-language standardized questionnaires completed by participants provides a quantitative foundation for assessment.

Risk and Self-Injury

The Suicidal Behaviors Questionnaire-Revised (SBQ-R), Suicidal Ideation Questionnaire (SIQ), and Inventory of Statements about Self-Injury for Adolescents (ISSIQ-A) assess suicidal behaviors and ideation. The Inventory of Callous-Unemotional Traits (ICAL) records the types and frequency of non-suicidal self-injury.

Emotional Symptoms

The Children's Depression Inventory-2 (CDI-2), Revised Child Anxiety and Depression Scale (RCADS), and Screen for Child Anxiety Related Emotional Disorders (SCARED) measure symptoms of depression and anxiety.

Emotion Regulation

The Difficulties in Emotion Regulation Scale (DERS) identifies targets for emotional intervention. Global Functioning: Broader instruments, including the Youth Self-Report (YSR), Child Behavior Checklist (CBCL), and Strengths and Difficulties Questionnaire (SDQ), assess the adolescent's mental state from self, parent, and teacher perspectives.

Follow-Up Assessments

Tracking Change at 1, 3, and 6 Months.

This stage is critical to the study, enabling careful monitoring of changes, treatment responses, and shifts in risk over time.

1-Month Follow-up: We focus on early stabilization. We repeat brief, sensitive measures like the SBQ-R and ISSIQ-A to check risk changes. We also use the CDI-2, RCADS, and DERS. **3-Month Follow-up:** This assessment checks stability. We repeat key measures to spot relapses and review emotional and behavioral profiles using the YSR. The CGAS gives an overall score of current functioning.

6-Month Follow-up: This assessment evaluates sustained progress and relapse prevention strategies. Results are compared to baseline using the SBQ-R, ISSIQ-A, and emotional symptom scales to confirm improvement. The CGAS or World Health Organization Disability Assessment Schedule (WHODAS) provides global functioning scores to facilitate reporting and interpretation of long-term outcomes.

A Commitment to Depth

In addition to the primary instruments, the protocol remains adaptable to address specific research questions. Additional assessments may include measures of impulsivity (UPPS-P), trauma (Childhood Trauma Questionnaire, CTQ), self-esteem (Rosenberg Self-Esteem Scale), and quality of life (World Health Organization Quality of Life-BREF, WHOQOL-BREF). This approach facilitates a comprehensive understanding of risk and resilience.

Conclusions

Non-suicidal self-injury (NSSI) constitutes a significant public health problem in the pediatric population, characterized by a complex and multifactorial etiology. As demonstrated, NSSI is not an isolated phenomenon but rather a strong predictor of subsequent suicidal behaviors, and is often interconnected with a constellation of psychiatric comorbidities, emotional regulation difficulties, and environmental risk factors.

The conceptualization of NSSI and suicidal behavior as existing on a continuum of psychopathological development, as opposed to a strict dichotomy, provides a crucial lens for clinical understanding. This perspective underscores the fluid nature of self-injury and the imperative need for early, targeted interventions that can interrupt the trajectory of risk.

The research project outlined here is a direct response to this need. By adopting a robust longitudinal methodology and a comprehensive, multi-informant psychometric protocol, the study aims to overcome the limitations of subjective clinical impressions. Its central objective, to identify the specific predictive factors for the transition from NSSI to suicide attempt in a clinical adolescent population, is highly relevant.

The successful completion of this project has the potential to contribute significantly to the field by enabling:

Validation of Diagnostic Criteria: Reinforcing the validity of NSSI as a distinct syndrome, as proposed in the DSM-5.

Strategic Prevention: Identifying measurable clinical risk markers that allow clinicians to screen and intervene more effectively with adolescents at higher risk of suicide.

Personalized Interventions: Informing the development of more precise and personalized treatment protocols that target not only the cessation of self-harm but also the mitigation of the underlying factors that drive its escalation.

Ultimately, a deep understanding of the trajectory from NSSI to suicidal behavior is a fundamental step towards developing more effective prevention strategies. The implementation of systematic screening, rigorous risk assessments, and evidence-based interventions in both clinical and community settings is essential to reduce the morbidity and mortality associated with these behaviors, promoting a path of resilience and well-being in the youth population.

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