REVIEW ARTICLE
J Korean Acad Child Adolesc Psychiatry 2025;36(2):47-53
https://doi.org/10.5765/jkacap.250003

eISSN 2233-9183

Check for updates

Current Phenomenon of Self-Harm in Children and Adolescents

Nindy Adhilah and Yunias Setiawati

Department of Child and Adolescent Psychiatry, Dr. Soetomo General Academic Hospital, Faculty of Medicine, Airlangga University, Surabaya, Indonesia

Self-harm is a prevalent phenomenon among children and adolescents, and its incidence has increased over time. This behavior is often a maladaptive coping mechanism caused by difficulties with emotional regulation. Self-harm behavior in children and adolescents is a predictor of future suicide attempts and requires comprehensive management. This study reviewed current holistic management of self-harm in children and adolescents. By synthesizing evidence-based practices, this study shows that management should include the recognition of risk factors for self-harm and suicidal behavior, early detection, pharmacological and non-pharmacological therapies, and prevention programs at all levels. This study aimed to increase awareness and encourage participation from all societal levels, including schools and policymakers, in handling self-harm in children and adolescents.

Keywords: Self-harm; Self-injury; Child; Adolescent.

Received: January 9, 2025 / **Revised:** March 11, 2025 / **Accepted:** March 18, 2025

Address for correspondence: Yunias Setiawati, Department of Child and Adolescent Psychiatry, Dr. Soetomo General Academic Hospital, Faculty of Medicine, Airlangga University, Jl. Mayjen. Prof. Dr. Moestopo, 47, Surabaya, Jawa Timur 60286, Indonesia
Tel: +62-315501681, Fax: +62-315022472, E-mail: yunias.setiawati@fk.unair.ac.id

INTRODUCTION

Self-harm is defined as any intentional act that causes injury regardless of suicidal ideation. Deliberate self-harm (DSH) is a nonfatal, self-injurious behavior with or without suicidal intent. Self-harm behavior performed without the conscious intention to end one's life is referred to as nonsuicidal self-injury (NSSI). Self-harm behavior should be monitored, as it increases the risk of future suicide attempts [1,2].

Studies have shown an increase in mental disorders, suicidal behavior, and self-harm among children and adolescents. A study in the UK showed a 68% increase in the incidence of self-harm among adolescent girls aged 13–16 years between 2011 and 2014 [3,4]. Studies in Australia have shown an increase in the number of visits among children and adolescents in emergency department for self-harm and suicidal behaviors [5]. In addition to an increase in the incidence, the onset of self-harm behavior was found to occur at a younger age. A study conducted in China showed that 14.24% of elementary school students had committed self-harm [6]. Another study in the UK showed that the youngest patient who presented to a hospital for self-harm was five years old [7]. An earlier age at first self-harm is associated with an increased frequency of self-harm and suicide attempts in the future [5,8].

A meta-analysis has shown that the lifetime prevalence of DSH in children and adolescents is 13.7%, with the highest prevalence reported in Asia (17.4%). The lifetime prevalence of NSSI in children and adolescents is 22.1%, with the highest prevalence reported in Australia (30.9%) [1]. Another meta-analysis that focused on children showed that the prevalence of self-harm in children aged 12 years and younger was 1.4%. However, all four studies in the meta-analysis used parental reports; therefore, this figure might understate the actual prevalence. The prevalence of NSSI in children aged 12 years and younger is 21.9% [9].

Self-harm behavior is mostly found in patients with mental disorders but can also be found in children and adolescents without mental disorders. Self-harm behavior in adolescents is more common in females than in males; however, some studies have shown that self-harm behavior in children is dominated by males [7,10].

SELF-HARM METHODS IN CHILDREN AND ADOLESCENTS

Self-harm methods include self-injury and poisoning. Self-injury is the deliberate action taken by oneself to cause injury. Methods of self-injury include cutting, biting, burning, scratching, excessive rubbing, hitting, head banging, jump-

ing from heights, hanging, or asphyxiating oneself. Tattooing and body piercing are usually not considered self-harm behaviors unless they are performed with the deliberate intention of harming oneself. Self-poisoning includes the intentional ingestion of any medication at doses larger than those prescribed as well as the consumption of substances that should not be consumed [7,11,12].

The most common methods of self-harm among children and adolescents are poisoning and cutting. Analgesics are the most commonly used drugs for self-poisoning. Other substances used to cause self-poisoning include antidepressants, benzodiazepines, antipsychotics, mood stabilizers, nonsteroidal anti-inflammatory drugs, and opiates [7,8,11-13]. Some of the reasons a person self-harms are to reduce or alleviate negative feelings by turning them into physical pain, punishing oneself to compensate for feelings of guilt, or seeking attention from the social environment to get what one wants [7,10].

NEUROBIOLOGY ASPECT OF SELF-HARM

The neurobiological mechanisms of NSSI in youth are multifaceted and involve a complex interplay of biological, psychological, and social factors. While the genetic heritability of NSSI is significant, estimated between 40% and 60%, specific genetic factors in the youth remain largely unidentified. Some studies have suggested that interactions between genetic predispositions and environmental stressors, such as peer stress or an invalidating emotional environment, may increase the risk of NSSI in children and adolescents [14].

Neuroimaging studies have identified several neural correlates associated with NSSI in youths and adults, suggesting distinguishable neuroimaging features in individuals with NSSI compared to those without NSSI; however, using neuroimaging as a definitive diagnostic tool at the individual level is still a complex and evolving area. Studies have found reduced gray matter volume in regions such as the insula and anterior cingulate cortex in adolescents with NSSI [15]. Decreased gray matter in the bilateral insular cortex and right inferior frontal gyrus has also been observed in female adolescents with NSSI [16]. Another study found that adolescents and young adults with NSSI showed lower white matter integrity in the uncinate fasciculus, cingulum, inferior and superior longitudinal fasciculi, callosal body, major and minor forceps, anterior thalamic radiation, and corticospinal tract than those healthy controls. The uncinate fasciculus and cingulum are associated with self-regulation; therefore, interventions that focus on self-regulation are considered beneficial in treating NSSI [17].

Endogenous opioids (endorphins, enkephalins, dynorphins, and endomorphins) are also thought to be involved in NSSI, particularly in pain sensitivity. Some studies have suggested that endogenous opioid levels may be lower in individuals who engage in NSSI than in controls. The opioid deficiency model proposes that NSSI restores homeostasis by increasing endogenous opioid levels. However, the findings on resting levels and responses are complex and require further research [14].

DIAGNOSIS AND CLASSIFICATION OF SELF-HARM

According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, self-harm behavior is not considered a mental disorder but a condition or problem that requires clinical attention and is often associated with mental disorders. Diagnostic criteria were proposed to establish the presence of NSSI (Table 1) and suicidal behavior disorder (Table 2) [12,18].

RISK AND PROTECTIVE FACTORS OF SELF-HARM BEHAVIOR IN CHILDREN AND ADOLESCENTS

Risk factors for self-harm among children and adolescents can be categorized into three groups: psychological, psychosocial, and sociodemographic. Psychological factors that increase the risk of self-harm behaviors include psychiatric comorbidities, exposure to self-harm in others, family members or friends with a history of suicide, family history of mental disorders, low self-esteem, perfectionism, impulsivity, and feelings of hopelessness and pessimism. Psychiatric comorbidities that can potentially lead to self-harm behaviors include conduct disorder, depression, anxiety, post-traumatic stress disorder (PTSD), personality disorder (particularly borderline personality disorder), eating disorder, attention-deficit/hyperactivity disorder (ADHD), substance abuse, and developmental and intellectual disorders [6,11,12,19-21].

Psychosocial factors that influence self-harm behaviors in children and adolescents include family conditions, relationships with peers, negative experiences, and other life adversities. Family conditions include insecure maternal attachment, problems with parents, high parental expectations, parental control, parental separation or divorce, incomplete parents, exposure to domestic violence, mental illness in parents, child abuse, and childhood neglect. School environment can also be a risk factor for self-harm behaviors in children and adolescents owing to the risk of bullying, isolation, peer teasing, or academic pressure. In addition, traumatic childhood events or sexual abuse increase the risk of self-harm among children

and adolescents. Violence and child abuse are known to disrupt brain development, potentially leading to risky behaviors [6,11,12,19,20,22,23].

Sociodemographic conditions also play a role in the emergence of self-harm behaviors in children and adolescents. Self-harm is more common in families with low socioeconomic conditions [7]. Based on age, the onset of self-harm at <15 years has the potential for the repetition of self-harm behavior [19].

There are few studies on the protective factors against self-harm behavior, as there are risk factors. Several factors are thought to be protective against self-harm behavior, such as support from family, friends, and the social environment good coping skills; problem-solving abilities; cognitive competence; resilience; life satisfaction; academic achievement; and good religious levels [19,20].

Table 1. DSM-5 proposed criteria for nonsuicidal self-injury

Proposed criteria
A. In the last year, the individual has, on 5 or more days, engaged in intentional self-inflicted damage to the surface of his or her body of a sort likely to induce bleeding, bruising, or pain (e.g., cutting, burning, stabbing, hitting, excessive rubbing), with the expectation that the injury will lead to only minor or moderate physical harm (i.e., there is no suicidal intent).
Note: The absence of suicidal intent has either been stated by the individual or can be inferred by the individual's repeated engagement in a behavior that the individual knows, or has learned, is not likely to result in death.
B. The individual engages in the self-injurious behavior with one or more of the following expectations:
1. To obtain relief from a negative feeling or cognitive state.
2. To resolve an interpersonal difficulty.
3. To induce a positive feeling state.
Note: The desired relief or response is experienced during or shortly after the self-injury, and the individual may display patterns of behavior suggesting a dependence on repeatedly engaging in it.
C. The intentional self-injury is associated with at least one of the following:
1. Interpersonal difficulties or negative feelings or thoughts, such as depression, anxiety, tension, anger, generalized distress, or self-criticism, occurring in the period immediately prior to the self-injurious act.
2. Prior to engaging in the act, a period of preoccupation with the intended behavior that is difficult to control.
3. Thinking about self-injury that occurs frequently, even when it is not acted upon.
D. The behavior is not socially sanctioned (e.g., body piercing, tattooing, part of a religious or cultural ritual) and is not restricted to picking a scab or nail biting.
E. The behavior or its consequences cause clinically significant distress or interference in interpersonal, academic, or other important areas of functioning.
F. The behavior does not occur exclusively during psychotic episodes, delirium, substance intoxication, or substance withdrawal. In individuals with a neurodevelopmental disorder, the behavior is not part of a pattern of repetitive stereotypies. The behavior is not better explained by another mental disorder or medical condition (e.g., psychotic disorder, autism spectrum disorder, intellectual disability, Lesch–Nyhan syndrome, stereotypic movement disorder with self-injury, trichotillomania [hair-pulling disorder], excoriation [skin-picking] disorder).

Table 2. DSM-5 proposed criteria for suicidal behavior disorder

Proposed criteria
A. Within the last 24 months, the individual has made a suicide attempt.
Note: A suicide attempt is a self-initiated sequence of behaviors by an individual who, at the time of initiation, expected that the set of actions would lead to his or her own death. The "time of initiation" is the time when a behavior took place that involved applying the method.
B. The act does not meet criteria for nonsuicidal self-injury—that is, it does not involve self-injury directed to the surface of the body undertaken to induce relief from a negative feeling/cognitive state or to achieve a positive mood state.
C. The diagnosis is not applied to suicidal ideation or to preparatory acts.
D. The act was not initiated during a state of delirium or confusion.
E. The act was not undertaken solely for a political or religious objective.
Specify if:
Current: Not more than 12 months since the last attempt.
In early remission: 12–24 months since the last attempt.

Internet use is another factor that influences self-harm behaviors in children and adolescents. The Internet has become widely used in recent years and is an essential tool for young individuals in many aspects, including education, social interaction, and recreational activities [24,25]. The age group with the highest rates of daily Internet use was adolescents, who also had the highest NSSI rate [26]. Research has shown that Internet use in children and adolescents has positive and negative effects on self-harm behaviors. A systematic review showed that Internet use has the potential to cause harm, such as normalizing self-harm behavior, triggering content, competition between users, and sources of dangerous information for vulnerable individuals. However, Internet use can also be used to create a sense of togetherness, support in times of crisis, and reduce social isolation [27].

Internet use involves the use of social media, which are digital tools for social interaction. Social media includes social networking sites (e.g., Facebook, Instagram, and Twitter), messaging applications (e.g., WhatsApp), online forums (e.g., Reddit), and video-sharing sites (e.g., YouTube and TikTok). Currently, social media platforms are used by individuals to share and engage in content associated with self-harm and suicide [26]. Several factors that can increase the risk of self-harm include cyberbullying, both for victims and perpetrators, problematic social media use (excessive time and energy devoted to social media, leading to impairment and addiction-like symptoms), sexting, exposure and generation of self-harm-related content on social media [28].

EARLY DETECTION OF SELF-HARM BEHAVIOR IN CHILDREN AND ADOLESCENTS

Self-harm is common among children and is a strong predictor of suicide attempts. The early detection of self-harm and suicide risk is necessary for immediate intervention. Children with psychiatric conditions, such as depression, anxiety, PTSD, ADHD, oppositional defiant disorder, or a history of maltreatment, should be routinely screened for self-harm and suicidal behavior [11].

The American Academy of Pediatrics recommends suicide risk screening be done universally in all children aged 12 years and older. In children aged 8–11 years, screening can be performed if the child has clinical indications, such as exhibiting behavioral changes, having a history of suicidal ideation or behavior, and showing signs of suicidal ideation or concerns from the patient or parents. In children less than eight years of age, screening is not indicated; however, an assessment of suicidal ideation and behavior can be performed immediately if there are warning signs or parental reports of suicidal behavior [29].

Several instruments are available for the early detection of self-harm behaviors in children and adolescents, including the Self-Harm Inventory. In addition to detecting self-harm behaviors, this instrument can also detect symptoms of borderline personality disorders. The instrument is self-reported and takes less than 5 min. The instrument consists of 22 questions with answer options of "yes" (score 1) and "no" (score 0). The total score ranged from 0 to 22. A total score of more than 5 indicates the presence of symptoms of borderline personality disorder, and further psychiatric assessment is required. In the general population, a total score of more than 5 indicates self-harm behavior, and a total score of more than 11 indicates psychopathological tendencies that require in-depth psychiatric examination [30-32].

The Self-Harm Screening Inventory is another psychometric tool that can be used for the early detection of self-harm behaviors in adolescents. This instrument is self-administered and consists of 10 questions associated with self-harm behavior in the past year [33].

MANAGEMENT OF SELF-HARM IN CHILDREN AND ADOLESCENTS

The management of self-harm in children and adolescents requires a multifactorial approach and involves experts such as doctors, nurses, social workers, therapists, psychologists, and teachers. School-based interventions are known to reduce self-harm behaviors in adolescents. Management may include psychosocial interventions, pharmacological therapies, or a combination of both [20,34].

To date, no psychopharmaceuticals are known to be effective in specifically reducing self-harm behaviors. Self-harm behaviors are common in patients with mental disorders, and pharmacological therapy can be administered to address the underlying psychiatric condition [3,34,35].

Self-harm behaviors are common in patients with depressive disorders; therefore, antidepressants are expected to reduce their depression [36]. The only antidepressant approved for childhood depression is fluoxetine [37]. However, the use of antidepressants in children and adolescents is controversial because of the risk of increased suicidal ideation and behavior. A meta-analysis conducted by Boaden et al. [36] showed that only the antidepressants venlafaxine and paroxetine were associated with an increased risk of suicidal ideation and behavior. Another meta-analysis conducted by Li et al. [38] showed that exposure to antidepressant drugs (including selective serotonin reuptake inhibitors [SSRIs]) significantly increased the risk of suicide and suicide attempts in children and adolescents compared with no antidepressant use. Analysis of the specific use of SSRIs also revealed a significantly increased

risk of suicide attempts. Additionally, there is a risk of taking more than the recommended dose with the intention of overdosing. Therefore, it is necessary to prescribe antidepressants to children and adolescents with caution and close supervision [34]. Nonpharmacological therapy should be prioritized in mild depression [39]. In adults, several factors are known to increase the risk of suicidal behavior with antidepressant use, including the severity of depression, first few weeks of treatment, drug abuse, poor response to antidepressants, physical pain, and a history of suicidal behavior or ideation. These factors can also contribute to suicidal risk in children and adolescents and thus need to be monitored [38]. After initiating antidepressant therapy, patients should be continuously monitored for unusual behavioral changes, suicidality, or clinical deterioration. It is recommended that the family and caregivers observe the patient and communicate any changes to the doctor [37].

Psychosocial interventions aim to help children and adolescents with self-harm behaviors to improve coping and problem-solving skills, manage their mental disorders, increase self-esteem, increase a sense of social connectedness, and reduce impulsivity and dangerous reactions to unpleasant situations. Interventions can be conducted either individually or in groups. The National Institute for Health and Care Excellence guidelines (2022) recommend dialectical behavior therapy for adolescents (DBT-A) as the therapy of choice for adolescents' self-harm. Several psychosocial interventions have been proposed as treatments for self-harm in children and adolescents; however, further studies are required to prove their effectiveness in alleviating specific self-harm symptoms. These interventions include cognitive behavioral therapy (CBT), mentalization-based therapy (MBT), group therapy, and family therapy [34,40].

DBT aims to develop patients' skills in realizing and accepting their thoughts and emotions, including painful and distressing internal experiences, without judgment or attempts to change, suppress, or avoid them. DBT-A is a therapeutic approach aimed at outpatients and consists of weekly individual therapy, group participation, and parental involvement. DBT-A focuses on developing mindfulness, distress tolerance, interpersonal effectiveness, and emotion and behavior regulation skills. Difficulties in emotion regulation are considered an impetus for self-harm. Therefore, the development of emotion regulation skills is expected to reduce self-harm and other behaviors that can negatively affect a patient's quality of life [34,41,42].

CBT is a psychotherapy method that helps patients identify and evaluate their thoughts, emotions, and behavioral responses to certain events. Furthermore, the patients are taught strategies to change their ways of thinking and interpreting events more adaptively. These changes are expected to alter emotional and behavioral responses such that positive functional behavior is formed. Mentalization is a person's ability to understand the motivation behind one's own and others' behaviors and emotional states. Maladaptive and impulsive coping behaviors such as self-harm are thought to occur because of a person's inability to mentalize. MBT aims to help individuals understand their emotions and behaviors and develop strategies to regulate them. Group therapy for children and adolescents is a psychotherapeutic intervention conducted together. Group therapy is considered more effective than individual therapy because it can train patients to develop interpersonal relationships with others. One risk factor for self-harm behaviors in children and adolescents is the presence of a dysfunctional family. Family therapy aims to improve communication patterns between family members and increase family attachment and parental warmth [34].

SELF-HARM PREVENTION IN CHILDREN AND ADOLESCENTS

Self-harm prevention programs in children and adolescents should not only be conducted in the family environment or health facilities but should also involve the school/college because many risk factors can occur in the school/college environment, such as bullying, isolation, conflicts with peers, and pressure for academic achievement. Schools are considered a natural environment for students to receive preventive programs so that their interpersonal skills and behavioral and emotional patterns can be extensively trained and strengthened [20,43].

Self-harm prevention can be performed on several levels: universal, selective, or indicated. Universal prevention is aimed at the general population of children and adolescents. Selective prevention programs aim to increase the resilience of vulnerable individuals. Indicated prevention programs aim to reduce the severity and morbidity of individuals who already exhibit self-harm behaviors. These programs should be implemented simultaneously and not rely on a single program. Universal prevention is a more important strategy than selective and indicated prevention alone [11,43].

Universal prevention aims to offset existing risks by increasing the resources and protective factors in the environment. Programs can include regulations to limit children's and adolescents' access to tools that can be used for self-harm or suicide, such as restricting access to high-altitude areas that can be jumping sites, and controlling the administration of drugs to reduce the risk of self-poisoning. In addition, media reporting on suicides should follow journalistic guidelines, such as not using sensationalized language, not describing

the method used, or other details of the incident. Mental health services should be improved by providing hotline services during crises. Health promotion can reduce the stigma toward mental health problems and increase public awareness of the phenomenon of self-harm and suicide in children and adolescents [12,44].

In schools, universal prevention programs can include providing psychoeducation to students on mental health and skills training to improve emotional, cognitive, behavioral, and social competencies. The aspects of self-harm and suicide prevention can also be taught to deal with problems and distress in life. Other programs that can be implemented include anti-bullying rules and strategies to reduce mental health problems and potential self-harm behaviors. In addition, interventions for students who experience academic and non-academic difficulties can reduce the burden on adolescents [20,43].

Selective prevention programs include screening for self-harm and suicidal ideation in vulnerable children and adolescents at risk for mental disorders. Furthermore, the indicated prevention programs are aimed at students who score above the threshold of self-harm behavior and are referred to professionals [43].

Availability of Data and Material

This review article contains no original data, as it primarily synthesizes and analyzes published study findings and existing literature. Consequently, no original documents or datasets are available.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

Author Contributions

Conceptualization: Nindy Adhilah, Yunias Setiawati. Data curation: Nindy Adhilah. Resources: Yunias Setiawati. Supervision: Yunias Setiawati. Writing—original draft: Nindy Adhilah. Writing—review & editing: Nindy Adhilah, Yunias Setiawati.

ORCID iDs

Nindy Adhilah https://orcid.org/0009-0009-6370-0315
Yunias Setiawati https://orcid.org/0000-0002-5920-3676

Funding Statement

None

Acknowledgments

None

REFERENCES

1) **Lim KS, Wong CH, McIntyre RS, Wang J, Zhang Z, Tran BX, et al.** 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. Int J Environ Res Public Health 2019;16:4581.
2) **Mughal F, Clarke L, Connolly R, Lee AYT, Quinlivan L, Kapur N.** Improving the management of self-harm in primary care. Br J Gen Pract 2023;73:148-149.
3) **Morgan C, Webb RT, Carr MJ, Kontopantelis E, Green J, Chew-Graham CA, et al.** Incidence, clinical management, and mortality risk following self harm among children and adolescents: cohort study in primary care. BMJ 2017;359:j4351.
4) **Cybulski L, Ashcroft DM, Carr MJ, Garg S, Chew-Graham CA, Kapur N, et al.** Temporal trends in annual incidence rates for psychiatric disorders and self-harm among children and adolescents in the UK, 2003-2018. BMC Psychiatry 2021;21:229.
5) **Townsend ML, Barr KR, Miller CE, Sanzone G.** Self-harm and suicidal behaviors in children: perspectives of mental health clinicians. J Pediatr Psychol 2024;49:571-579.
6) **Li X, Chen F, Lin Y, Jia Z, Tucker W, He J, et al.** Research on the relationships between psychological problems and school bullying and non-suicidal self-injury among rural primary and middle school students in developing areas of China. Int J Environ Res Public Health 2020;17:3371.
7) **Geulayov G, Casey D, Bale L, Brand F, Townsend E, Ness J, et al.** Self-harm in children 12 years and younger: characteristics and outcomes based on the multicentre study of self-harm in England. Soc Psychiatry Psychiatr Epidemiol 2022;57:139-148.
8) **Brager-Larsen A, Zeiner P, Klungsøyr O, Mehlum L.** Is age of self-harm onset associated with increased frequency of non-suicidal self-injury and suicide attempts in adolescent outpatients? BMC Psychiatry 2022;22:58.
9) **Geoffroy MC, Bouchard S, Per M, Khoury B, Chartrand E, Renaud J, et al.** Prevalence of suicidal ideation and self-harm behaviours in children aged 12 years and younger: a systematic review and meta-analysis. Lancet Psychiatry 2022;9:703-714.
10) **Vázquez López P, Armero Pedreira P, Martínez-Sánchez L, García Cruz JM, Bonetde Luna C, Notario Herrero F, et al.** Self-injury and suicidal behavior in children and youth population: learning from the pandemic. An Pediatr (Engl Ed) 2023;98:204-212.
11) **Thompson AJ, Campo JV, Hughes JL, Bridge JA, Ruch DA, Fontanella CA.** Clinical profiles associated with deliberate self-harm in preadolescent children. JAACAP Open 2024 Aug 20 [Epub]. Available from: https://doi.org/10.1016/j.jaacop.2024.06.004.
12) **Siu AMH.** Self-harm and suicide among children and adolescents in Hong Kong: a review of prevalence, risk factors, and prevention strategies. J Adolesc Health 2019;64(6S):S59-S64.
13) **McEvoy D, Joyce M, Mongan D, Clarke M, Codd M.** Comparing times of self-harm presentations to hospital emergency departments in children, adolescents, young adults and adults: a national registry study 2007-2019. BMC Psychiatry 2024;24:474.
14) **Kaess M, Hooley JM, Klimes-Dougan B, Koenig J, Plener PL, Reichl C, et al.** Advancing a temporal framework for understanding the biology of nonsuicidal self- injury: an expert review. Neurosci Biobehav Rev 2021;130:228-239.
15) **Halicka-Masłowska J, Szewczuk-Bogusławska M, Adamska A, Misiak B.** Neurobiology of the association between non-suicidal self-injury, suicidal behavior and emotional intelligence: a review. Arch Psychiatr Psych 2020;22:25-35.
16) **Won GH, Bae S, Kim HK, Choi TY.** Subcortical volume analysis in non-suicidal self-injury adolescents: a pilot study. Psychiatry Res Neuroimaging 2023;331:111617.
17) **Westlund Schreiner M, Mueller BA, Klimes-Dougan B, Begnel ED, Fiecas M, Hill D, et al.** White matter microstructure in adolescents and young adults with non-suicidal self-injury. Front Psychiatry 2020;10:1019.
18) **American Psychiatric Association.** Diagnostic and statistical manual of mental disorders (DSM-5). 5th ed. Arlington: American Psychiatric Association Publishing;2013. p.801-806.
19) **Rahman F, Webb RT, Wittkowski A.** Risk factors for self-harm repetition in adolescents: a systematic review. Clin Psychol Rev

2021;88:102048.
20) **McEvoy D, Brannigan R, Cooke L, Butler E, Walsh C, Arensman E, et al.** Risk and protective factors for self-harm in adolescents and young adults: an umbrella review of systematic reviews. J Psychiatr Res 2023;168:353-380.
21) **Sekmen M, Grijalva CG, Zhu Y, Williams DJ, Feinstein JA, Stassun JC, et al.** Characteristics associated with serious self-harm events in children and adolescents. Pediatrics 2023;151:e2022059817.
22) **Borschmann R, Mundy LK, Canterford L, Moreno-Betancur M, Moran PA, Allen NB, et al.** Self-harm in primary school-aged children: prospective cohort study. PLoS One 2020;15:e0242802.
23) **Indriati W, Yurista SR, Ardani IGAI, Setiawati Y.** Childhood maltreatment and toxic stress: what we have learned from the COVID-19 pandemic era. J Korean Acad Child Adolesc Psychiatry 2024;35:163-168.
24) **He X, Yu Q, Peng J, Yu J, Wu T, Qin Y, et al.** Correlations between non-suicidal self-injury and problematic internet use among Chinese adolescents: a systematic review and meta-analysis. Front Psychiatry 2024;15:1408508.
25) **Mészáros G, Györi D, Horváth LO, Szentiványi D, Balázs J.** Non-suicidal self-injury: its associations with pathological internet use and psychopathology among adolescents. Front Psychiatry 2020;11:814.
26) **Spínola LG, Calaboiça C, Carvalho IP.** The use of social networking sites and its association with non-suicidal self-injury among children and adolescents: a systematic review. J Affect Disord Rep 2024;16:100781.
27) **Marchant A, Hawton K, Stewart A, Montgomery P, Singaravelu V, Lloyd K, et al.** A systematic review of the relationship between internet use, self-harm and suicidal behaviour in young people: the good, the bad and the unknown. PLoS One 2017;12:e0181722.
28) **Nesi J, Burke TA, Bettis AH, Kudinova AY, Thompson EC, MacPherson HA, et al.** Social media use and self-injurious thoughts and behaviors: a systematic review and meta-analysis. Clin Psychol Rev 2021;87:102038.
29) **American Academy of Pediatrics.** Screening for suicide risk in clinical practice [Internet]. Itasca: American Academy of Pediatrics; 2023 [cited 2024 Dec 20]. Available from: https://www.aap.org/en/patient-care/blueprint-for-youth-suicide-prevention/strategies-for-clinical-settings-for-youth-suicide-prevention/screening-for-suicide-risk-in-clinical-practice/.
30) **Sansone RA, Sansone LA.** Measuring self-harm behavior with the self-harm inventory. Psychiatry (Edgmont) 2010;7:16-20.
31) **Latimer S, Covic T, Cumming SR, Tennant A.** Psychometric analysis of the self-harm inventory using Rasch modelling. BMC Psychiatry 2009;9:53.
32) **Kusumadewi AF, Yoga BH, Sumarni, Ismanto SH.** [Self-harm inventory (SHI) versi Indonesia]. J Psikiatri Surabaya 2019;8:21-25. Indonesian
33) **Kim S, Seo DG, Park JC, Son Y, Lee JH, Yoon D, et al.** Development and validation of the self-harm screening inventory (SHSI) for adolescents. PLoS One 2022;17:e0262723.
34) **Witt KG, Hetrick SE, Rajaram G, Hazell P, Taylor Salisbury TL, Townsend E, et al.** Interventions for self-harm in children and adolescents. Cochrane Database Syst Rev 2021;3:CD013667.
35) **National Institute for Health and Care Excellence.** Self-harm: assessment, management and preventing recurrence. London: National Institute for Health and Care Excellence (NICE); 2022.
36) **Boaden K, Tomlinson A, Cortese S, Cipriani A.** Antidepressants in children and adolescents: meta-review of efficacy, tolerability and suicidality in acute treatment. Front Psychiatry 2020;11:717.
37) **Food and Drug Administration.** Suicidality in children and adolescents being treated with antidepressant medications [Internet]. Silver Spring: Food and Drug Administration; 2018 [cited 2025 Mar 9]. Available from: https://www.fda.gov/drugs/postmarket-drug-safety-information-patients-and-providers/suicidality-children-and-adolescents-being-treated-antidepressant-medications.
38) **Li K, Zhou G, Xiao Y, Gu J, Chen Q, Xie S, et al.** Risk of suicidal behaviors and antidepressant exposure among children and adolescents: a meta-analysis of observational studies. Front Psychiatry 2022;13:880496.
39) **Hazell P.** Antidepressants in adolescence. Aust Prescr 2022;45:49-52.
40) **National Collaborating Centre for Mental Health.** Self-harm and suicide prevention competence framework: children and young people [Internet]. London: National Collaborating Centre for Mental Health; 2018 [cited 2024 Dec 20]. Available from: https://www.ucl.ac.uk/pals/research/clinical-educational-and-health-psychology/research-groups/competence-frameworks/self-harm.
41) **Asarnow JR, Berk MS, Bedics J, Adrian M, Gallop R, Cohen J, et al.** Dialectical behavior therapy for suicidal self-harming youth: emotion regulation, mechanisms, and mediators. J Am Acad Child Adolesc Psychiatry 2021;60:1105-1115.e4.
42) **Kothgassner OD, Goreis A, Robinson K, Huscsava MM, Schmahl C, Plener PL.** Efficacy of dialectical behavior therapy for adolescent self-harm and suicidal ideation: a systematic review and meta-analysis. Psychol Med 2021;51:1057-1067.
43) **Liljedahl SI, Hellner C, Pettersson A, Ghaderi A.** School-based self-harm prevention programs: a systematic review with implications for international implementation. Scand J Psychol 2023;64:825-837.
44) **World Health Organization.** Preventing suicide: a resource for media professionals, update 2023 [Internet]. Geneva: World Health Organization; 2023 [cited 2024 Dec 20]. Available from: https://www.who.int/publications/i/item/9789240076846.