Non-Suicidal Self-Injury in Adolescence

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This review will teach readers about non-suicidal self-injury (NSSI), which is a serious and common problem, particularly among adolescents. We shall begin by explaining what we mean by non-suicidal self-injury, and then move on to discuss the epidemiology, causes and outcomes. We shall finish by discussing assessment and treatment, as well as some important research issues. NSSI is meaningfully distinct from suicidal self-injury despite being closely related, and it presents in a variety of forms. Many factors have been implicated in the ontogenesis of NSSI, in particular poor family relationships, early abuse, affective instability and reactivity, impulsivity, psychological illness and distress. While the majority of cases of adolescent NSSI resolve on their own by adulthood, NSSI is associated with a number of adverse physical, psychological, and social outcomes. It is also a common cause of presentation to hospital that will be frequently encountered by paediatricians and emergency department doctors. There is only preliminary, unreplicated, evidence for specific treatments. The most practical approach may be to treat any underlying psychiatric illness, address environmental stressors, and provide a supportive and positive therapeutic environment. Anyone reporting NSSI should be assessed for risk of repetition and suicide, and any physical injuries should be treated.

**Key words:** Self-harm, self-injury, adolescent, non-suicidal, treatment, prognosis, antecedent, suicide.

## 1. Self-Harm

### 1.1 Suicidal vs Non-Suicidal Self-Harm

Non-suicidal self-injury (NSSI) is any intentionally harmful self-inflicted behaviour where the individual does not have suicidal intent. There has been some debate over whether NSSI is meaningfully distinct from attempted suicide, however it is our opinion that there is an overwhelming body of evidence suggesting that it is. Some researchers point to the greatly elevated risk for suicide among those who engage in NSSI as evidence that the two are not meaningfully different, however there is an elevated risk for suicide in nearly all psychiatric disorders, and while the association between suicide and other disorders may not be as strong as it is for NSSI, increased risk of suicide my no means that the behaviour is not distinct. Take substance abuse and eating disorders for example. Both are related to significantly increased risk of suicide as well as accidental death, and yet few if any researchers would argue that either substance abuse or eating disorder behaviours are fundamentally the same as suicide attempts, even if they result in death. Like substance abuse and eating disorder behaviours, NSSI usually stems from different motivations and is related to different psychological features than suicide and should therefore be considered distinct despite being closely related.

In the first place, there is, by definition, a manifest and important difference in the desired result of NSSI and attempted suicide. The majority of people who engage in NSSI never make a suicide attempt and many are explicit that they had no wish or intent to die when engaging in self-harm. As such, the two behaviours arise from different motivational pathways. Whereas the aim of NSSI is often intense pain, to distract or otherwise relieve the person engaging in NSSI from overwhelming distressing effect, many suicide attempts are planned to be as painless as possible. In

fact, some patients report engaging in NSSI in order to reduce unwanted thoughts of suicide. Moreover, the typical degree of planning before NSSI and suicide attempts is generally different. The majority of people who engage in NSSI do so after only a few minutes of considering it, generally after little planning or consideration of consequences, particularly if NSSI is a highly repeated and habitual behaviour. Conversely, suicide attempts are more likely to be preceded by careful planning, particularly where suicidal intent is high. There are, moreover, a number of other ways in which people making suicide attempts differ from those engaging in NSSI only: people who engage in suicide attempts are typically more impulsive, are more likely to have a psychiatric diagnosis or a family history of psychiatric illness, and show different neurobiology from people who engage in NSSI alone. For example, low cholesterol concentrations and low levels of essential fatty acids have been repeatedly linked to NSSI, whereas evidence for their relation to suicide is mixed.

Further, NSSI and suicidality have different associations with other psychiatric disorders: adolescents who only attempt suicide are more likely to have a concurrent clinical disorder of depression or post-traumatic stress disorder than those who only engage in NSSI, whereas those who only engage in NSSI are more likely to have features of borderline personality disorder.

Finally, there is a concern that the term “non-suicidal” trivialises the nature of the self-harm, and makes it seem unimportant compared to attempted suicide. This should by no means be the case, as NSSI can have serious and lasting consequences. The problem is with the trivialising, not with the label.

**1.2 Types of NSSI**

NSSI presents in a variety of forms and through various motivational, biological, and environmental pathways. Adolescents report engaging not only in

more obvious forms of NSSI such as cutting, biting, scratching, and burning, but also report methods such as recklessness, eating disordered behaviours, and non-suicidal pill-abuse. Cutting is the most common form of NSSI, followed by hitting and poisoning (including pill abuse). Most studies show that NSSI is more common in females, although some more recent studies and meta-analyses have shown no gender difference; this change may be because more recent studies are including more 'male-type' NSSI. Girls are more likely to engage in cutting, whereas boys may be more likely to engage in previously-overlooked forms of NSSI such as punching oneself or other objects, breaking bones, and risk taking behaviours. It is therefore imperative that a broad definition of NSSI be used in investigations of self-harm as failing to do so could lead to certain groups, such as males, being overlooked. It is also important to note that different psychological and motivational profiles have been found among people who engage in different types of NSSI. For example, overdosing is related to higher suicidality than cutting, whereas cutting is more likely to be engaged in impulsively than overdosing. As such, distinguishing between forms of NSSI may have significant prognostic and clinical implications.

**2. Epidemiology**

NSSI is both a serious problem, and a common one. Around a quarter of adolescents have engaged in NSSI at least once in their lives, and nearly a tenth have engaged in NSSI repeatedly. There has not been a significant increase in prevalence of NSSI over the past two decades, nor do there seem to be different rates across developed regions including Asia, Australia and New Zealand, Europe, the United Kingdom, Canada, and the USA. Rates of NSSI are highest among adolescents, and

this is also the most common time of first incidence. In fact, 90% of cases of adolescent NSSI remit by young adulthood without intervention.

**3. Particular relevance to adolescence**

There are many possible reasons why NSSI is particularly prevalent in adolescence. Adolescence is a tumultuous phase during which people are undergoing significant social, physiological, and psychological changes. During this time, neurotransmitter levels and functionality are in flux, while the prefrontal cortex, responsible for problem solving and behavioural inhibition is still developing, and social structures are rapidly changing. It is no wonder therefore that adolescence is associated with high rates of, not only NSSI, but also a number of other psychological and behavioural problems, such as depression, anxiety, substance misuse, eating disorders, and risk taking, which are all in turn associated with NSSI.

Indeed, the risk for NSSI is closely linked to pubertal development, independent of age. This association may be mediated by the higher rates of depressive symptoms, substance use, and sexual activity that accompany pubertal maturation. After puberty however, age is inversely related to rates of NSSI.

If NSSI is exacerbated by the social and physiological changes inherent to adolescence, it is unsurprising that NSSI subsides in the relative stability of adulthood. Moreover, adulthood is associated with increased behavioural inhibition, better affective stability, and more stable emotional support systems, all of which are protective factors against NSSI. Finally, NSSI may be more socially acceptable in adolescence than in adulthood, possible because adulthood is associated with more responsibilities with which NSSI might interfere, greater emphasis on mature

responses to distress, and more consequences of NSSI, such as employment difficulties resulting from visible scars or other wounds.

Nevertheless, given the prevalence and malignancy of NSSI among adolescents, discovering the etiological and developmental processes of self-injurious pathways during this period is of paramount importance.

## 4. Risk factors for NSSI

Many factors have been implicated in the ontogenesis of NSSI, in particular poor family relationships, early abuse, and psychological illness and distress. We shall now discuss some risk factors in more detail.

### 4.1 Affective instability

Affective instability and reactivity have been linked to NSSI, with some studies even finding that emotional dysregulation and variability are predictive of NSSI regardless of the valence of those emotions. People who engage in NSSI often have problems with both regulating emotional responses and tolerating intense emotions. This combination of deficiencies means that they are more likely to experience extremes of affect, which are at the same time also more unpleasant for them than for other people. Indeed, most incidents of NSSI are preceded by negative affect and followed by relief therefrom. Getting relief from these overwhelming or intolerable emotions is frequently cited as one of the primary reasons for why people engage in NSSI. In addition, many people who engage in NSSI are alexithymic, showing difficulties in understanding, identifying, and expressing their emotions.

### 4.2 Impulsivity

Impulsivity and inhibitory control problems are also strongly associated with NSSI, particularly in response to strong affect. A number of impulse control related disorders are highly comorbid with NSSI, such as substance abuse, eating disorders, and other risk taking behaviours. In fact, impulsivity seems to account for much of the comorbidity between BPD and NSSI. Some researchers have even proposed that NSSI could be conceptualized as just one symptom or expression of a broader impulsivity disorder, or fundamentally as an impulse control disorder in its own right. Impulsivity may influence NSSI proximally by allowing people to act on these urges to engage in behaviours that have potentially serious and lasting consequences, or more distally by leading to increased exposure to adverse experiences. Indeed, many adolescents spend less than 5 minutes considering engaging in NSSI before doing so. However, findings have been mixed, with some researchers finding that only certain aspects of impulsivity are associated with NSSI, that only self-report and not behavioural measures of impulsivity are associated with NSSI, that impulsivity is associated with the severity but not the presence of NSSI, and that impulsivity is only associated with NSSI among females. These mixed findings may be due to the heterogeneity of the construct of impulsivity, they ways in which it is conceptualized, and how it is measured.

**4.3 Trauma**

Adverse experiences in childhood have been associated with a number of NSSI-related negative mental health outcomes, such as substance abuse, eating disorder behaviour, depression, and suicide attempts. Moreover, trauma in the forms of sexual and physical abuse has been robustly associated with NSSI among adolescents. Early adversity may predispose individuals to engage in NSSI through its

role as a risk factor in the onset of psychological distress and psychiatric illness, with negative life events frequently preceding the onset of psychological disorders. Moreover, different types of adverse experiences often co-occur and are cumulatively negatively impactful on wellbeing; higher numbers of negative life events are not only associated with the onset of psychopathology, but also with poorer outcomes and greater chances of relapse. In turn, nearly all psychiatric disorders are associated with increased risk of NSSI, and often so too is greater severity of the disorder.

Childhood exposure to stressful life events may, moreover, disrupt the development of stress response systems in the brain, leading to problems with emotion processing and regulation later in life. Given that the primary motivations for NSSI are to get relief from overwhelming emotions, to relieve distressing affect, and to communicate distress to others, NSSI may help regulate the anxiety and depressed affect being experienced as a result of adverse childhood experiences.

One other explanation for the link between early adversity and NSSI is that traumatic experiences, particularly those that happen within the home, are perpetrated by a parent figure, or are not adequately responded to by a parent figure, are likely to impair the child's relationship with their parents. This idea is supported by the fact that familial types of traumatic experiences are most strongly associated with NSSI, and by our recent finding that poor family relationships partly mediate the association between early family adversity and adolescent-onset NSSI.

### 4.4 Attachment

Poor parent-child relationships are associated with a number of behaviours that could easily be considered forms of NSSI, such as substance abuse and risky sexual behaviour, eating disorders, delinquency, and suicidal ideation. It is, therefore,

unsurprising that poor parent-child relationships are related to NSSI among young adults, and that recent family conflict often precedes adolescent engagement in NSSI. Parent-child communication is robustly associated with adolescent NSSI, even when controlling for a number of other factors, and may be more impaired among adolescents who engage in NSSI than even in other psychiatric populations. It appears, moreover, that child-parent relationships are more important than peer relationships in regards to adolescent NSSI, despite suggestions from some researchers that peers are generally predominantly influential during this period. Nevertheless, regardless of whether they engage in NSSI, adolescents report being most likely to turn to their peers as opposed to other sources for support, and girls seem more likely than boys to seek help from any source. However findings from several studies suggest that adolescents' confidence and security in their relationships with their parents are more important for psychological well-being than is their actual reliance on parents for support.

There are a number of ways by which family relationships may influence the onset of NSSI, either directly, and/or by their influence on other factors, such as self-esteem and affect regulation, which in turn are related to NSSI. Insecurely attached children are less likely to approach their parents for support when distressed for fear of being punished or ignored, and they may learn to exaggerate their need for support in order to secure it. As such, parent-child attachment plays an important role in self-regulation of behaviors and emotions, and insecure attachment may lead to regulation problems such as depression and anxiety, aggression, impulsivity, and heightened reactivity to stress. These corollaries of insecure attachment may also make individuals more vulnerable to deleterious impact of trauma. Indeed numerous studies

have shown that secure parent-child attachment buffers against the impact and distress of traumatic events.

Parental criticism is one aspect of child-parent relationships that has been repeatedly and robustly associated with adolescent NSSI, and is not only associated with higher rates of NSSI overall but also with greater repetition of NSSI once initiated. These links between NSSI and parental criticism are largely mediated by feelings of alienation from parents and self-criticism. Impaired communication of emotions to parents has been repeatedly linked to NSSI among adolescents. Adolescents who engaged in NSSI not only report more difficulty talking to people about problems, but also they report fewer people overall with whom they can talk. Given that the primary reported motivations for NSSI are to relieve distressing affect, self-punishment, and to communicate distress to others, some adolescents may resort to NSSI when other means of communicating distress fail. As such, one of the reasons why adolescents are at increased risk of NSSI may be because they are particularly poor at recognizing and responding to their own feelings and needs, and often therefore express their distress through actions rather than words.

**4.5 Psychological illness and distress**

Higher rates of NSSI are associated with nearly all psychiatric disorders, however NSSI is particularly prevalent among patients with depression, anxiety, eating disorders, and borderline personality disorder. Indeed, over half of individuals with BPD engage in NSSI. These particularly high rates of NSSI are unsurprising given that BPD is characterized by extremely insecure attachment styles, as well as intense and unstable emotions from which NSSI may be a means of relief. Moreover, the high comorbidity of NSSI and BPD may be due in part to the similar antecedents

of both disorders: childhood traumatic experiences such as physical and sexual abuse, and family dysfunction have been robustly linked to both NSSI and BPD.

BPD is the only DSM-IV psychiatric diagnosis for which NSSI is a criterion, which may incorrectly lead some clinicians to assume that any patient with NSSI has BPD. Engaging in NSSI is not, however, synonymous with BPD. Firstly**,** the prevalence of BPD is significantly lower than the prevalence of NSSI in both the general population and among adolescents. Moreover, NSSI is often present in patients with psychiatric disorders other than BPD, as well as in people who do not meet the diagnostic criteria for any mental illness. Finally, many clinicians believe it is inappropriate to give a diagnosis of any personality disorder to young people, as their personalities are still developing.

NSSI is also particularly prevalent among people with eating disorder. Around a quarter of people with anorexia nervosa and a third of those with bulimia nervosa report engaging in NSSI at some point in their lives. The higher rates of NSSI among people with bulimia than anorexia is unsurprising given the impulsive nature of bulimic behavior and strong links between impulsivity and NSSI. As with BPD, this high comorbidity of NSSI and eating disorders may be in large part due to the shared antecedents of both behaviors. Like NSSI, eating disorders are associated with traumatic childhood experiences, impaired attachment, dissociation, and impulse control problems. Moreover, in some instances eating disorder behaviour may actually be a form of NSSI, and is sometimes considered as such by adolescents. It is our opinion that the distinction between eating disorder and NSSI lies in the motivation and not the behaviour: when an adolescent is starving themselves with the intention of losing weight the behaviour may be anorectic, however when an adolescent makes themselves purge or skip a meal as a punishment the behaviour may

be NSSI. The distinction is sometimes difficult to make and is often blurred, however it may also have important treatment implications: emphasising the harmfulness of the behaviour may help convince an eating disorder patient to stop, whereas it could actually reinforce someone engaging in the same behaviour as NSSI. This theory, however, has yet to be tested.

Crucially, NSSI is often present in people without a formally-diagnosable mental illness. However, in those cases, it is generally still a response to psychological distress. Indeed, NSSI should be seen as a transdiagnostic behaviour. It is caused by the combination of psychological distress (which may or may not be part of a psychiatric 'illness') plus a propensity to self-harm when distressed. The other risk factors in this section contribute to this propensity.

**5. Prognosis**

NSSI is, as its name suggests self-injury, and therefore harmful. It has been associated with a number of negative outcomes, such as substance misuse, emotional problems, antisocial behaviour, low self-esteem, and increased risk taking. Adolescent NSSI has been robustly linked to future development of depressive and anxiety disorders (even after sporadic self-harm, once per year), and is a strong predictor of suicide attempts. Moreover, repeated NSSI puts people at greater risk of suicide than single or sporadic episodes. Suicide risk appears to be especially high immediately following incidents of NSSI.

Once NSSI is established it is possible that recurrence habituates people to the pain from self-harm suggesting that they are insensitive to punishing outcomes and/or more directed to acute rewards. Recurrent NSSI can also lead to higher pain tolerance, reduced fear of death, and more dangerous acts of self-harm. NSSI also presents a risk

of scarring, infection, and other lasting physiological damage; it can have serious social consequences, leading to teasing and peer rejection, exclusion from school, and over-protective parenting; and can lead to negative feelings, including shame and guilt. This can result in a deteriorating cycle of impaired social relationships and negative emotions.

**6. Short-term assessment and management**

Above all, assessment and treatment of NSSI should be offered in a safe and respectful environment. Anyone reporting NSSI should be assessed for risk of repetition and suicide, taking into consideration clinical and demographic factors related to NSSI and suicide, and psychological distress, particularly depression, anxiety, and hopelessness. Any young person reporting NSSI should also be offered psychological assessment, with special attention being given to their family and social situation, psychological distress, suicidality, presence of mental illness, motivational factors for engaging in NSSI, and willingness to receive further treatment. UK NICE Guidelines state that all adolescents presenting to hospital with NSSI should be admitted overnight and be fully assessed before discharge or further treatment. This overnight admission gives the patient a chance to sleep off acute negative feelings, and assessment is often more accurate if repeated in the cold light of day than just after the incident, particularly if the patient has been admitted at night time when their and their family's main priority is sleep. Patients should be referred to further treatment based on their needs, wishes, psychological distress, the severity of their NSSI, and risk. Any physical injuries sustained from NSSI should be treated regardless of the patient's willingness to engage in psychological treatment. When a patient engages in repeated NSSI it is important to consider that different incidences

may result from different motivational pathways and should be considered distinct. Potential for overdosing should be considered when prescribing any medications to patients with NSSI. In instances of repeated NSSI, advice can be offered on alternative coping strategies, self-management of injuries, and harm-minimization, and in cases where NSSI has led to severe scarring then scar tissue management advice should also be offered.

## 7. Treatment

NSSI is addictive**,** socially contagious, and escalates over time. As such, it is imperative that NSSI is recognized and treated early. Unfortunately, it is often overlooked and rarely treated, with less than 13% of reported cases among adolescents referred to a hospital. There have been few randomised control trials of treatments for NSSI, and those that have been done have found few significant differences between treatment methods. While three therapies have been shown to be more effective at reducing NSSI in adolescent populations than treatment as usual in individual studies (mentalisation-based treatment, dialectical behaviour therapy, and interpersonal psychotherapy-intensive), none of these studies have been replicated. Moreover, most facilities are unable to offer these specific treatments, and such lengthy and intense treatment may not be feasible or acceptable to patients or treatment funders. To date, there is also no evidence to support pharmacological treatment of NSSI. As such, the most practical approach to NSSI seems to be to treat any underlying psychiatric illness, address environmental stressors, and provide a supportive and positive therapeutic environment.

## 8. Research Methods

Methodological factors make a significant difference in reported rates of NSSI. Specifically, multiple item checklists of NSSI behaviours yield higher rates than single yes/no items about presence or absence of engagement of NSSI. This may be because participants are more likely to recall engaging in behaviours when asked about them specifically than when asked a more general question. Higher and presumably more accurate rates of reported NSSI are also obtained when anonymous and self-administered questionnaires are used than when participants are potentially or explicitly identifiable, or when studies are interview based. These differences are likely due to socially desirable under-reporting of NSSI, which is a sensitive and stigmatized subject.

Several studies have demonstrated that asking about NSSI or about specific NSSI behaviours is not significantly distressing and does not increase the likelihood of participants going on to engage in those behaviours, and may actually reduce these behaviors among those at high-risk.

**9. Conclusion**

NSSI is a serious and prevalent problem, particularly among adolescents. While the vast majority of cases of adolescent NSSI resolve themselves by adulthood, NSSI is a very strong indicator of present and future suicide risk and psychopathology, and can have other serious and debilitating consequences such as organ damage and scarring. As such, it should be taken seriously, even when patients report low suicidality. There is currently a dearth of evidence in support of specific treatments for NSSI, which should be addressed by further randomized controlled trials. Presently the best approach seems to be addressing underlying causes of psychological illness and distress, treating any physical harm resulting from NSSI,

and providing a supportive and respectful therapeutic environment. Hopefully further research and a better understanding of the causes of NSSI will help the development of more effective and specific treatments in the future.

### *Practice points*

- NSSI is a serious indicator of suicide risk, even when patients report suicidal intent to be low.
- NSSI is not necessarily indicative of any psychiatric disorder.
- NSSI often occurs in the context of family dysfunction and/or abuse.
- There is insufficient evidence to support specific treatments of NSSI.
- Treatment should address physical harm and causes of psychological distress.

### *Conflicts of interest*

Neither of the authors has any conflicts of interest that could inappropriately influence or bias the content of this article.


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