PREVALENCE AND CORRELATES, DIAGNOSTIC CLASSIFICATION, PSYCHOLOGICAL VULNERABILITY FACTORS, AND FUNCTIONS OF NON-SUICIDAL SELF-INJURY AMONG UNIVERSITY STUDENTS: A MIXED-METHOD ANALYSIS

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ABSTRACT

Non-suicidal self-injury (NSSI)—the deliberate destruction of one’s own body tissue without lethal intent—is a growing public health concern. Chapter 1 serves as a comprehensive guide for practitioners working with youth, and Chapter 2 presents the current research investigating multiple aspects of NSSI within a treatment-seeking university population. Objectives: Study 1 (n = 128) examined the prevalence and correlates of NSSI (Aim 1), assessed for NSSI disorder (Aim 2), and investigated anxiety sensitivity and distress tolerance as potential psychological vulnerability factors for NSSI (Aim 3). Study 2 (n = 7) applied qualitative methodology to explore the lived experiences of students who self-injure (Aim 4). Results: Forty-eight students (37.5%) endorsed lifetime NSSI, and 9.4% of the overall sample met full DSM-5 criteria for NSSI disorder. As predicted, lifetime NSSI was associated with visiting self-harm websites, knowledge of peer/family NSSI, history of abuse/assault, and lower capacity to tolerate distress. Contrary to prediction, anxiety sensitivity was not significantly higher among individuals with a history of NSSI, although the data revealed a trend in this direction. Discussion: NSSI is a prevalent, impairing, and isolating behavior associated with emotional distress and interference in functioning. Yet, to date, no empirically-supported treatments for NSSI exist. Further research is needed to identify underlying vulnerability factors for NSSI that could serve as treatment targets. The role of anxiety in the onset and maintenance of NSSI remains an important area of scientific inquiry. Future research is needed to identify prevention strategies and interventions for treating NSSI to effectively reduce the prevalence and impact of this silent epidemic.

Keywords: anxiety sensitivity, distress tolerance, non-suicidal self-injury disorder, self-harm, self-injury, university students
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CHAPTER ONE

Non-Suicidal Self-Injury Among Youth: A Review for the Practitioner

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Non-Suicidal Self-Injury Among Youth: A Review for the Practitioner

Non-suicidal self-injury (NSSI) is a significant global public health concern that has received increased attention in the scientific community, the media, and popular culture in recent years (Muehlenkamp, Claes, Havertape, & Plener, 2012a). NSSI refers to the intentional destruction of one’s own body tissue without lethal intent (Nock, 2010). Recent scholars have adopted a functional approach to understanding NSSI (Klonsky, 2007; Nock & Prinstein, 2004), and emerging research has begun to pinpoint mechanisms that may underlie NSSI. Robust empirical evidence indicates that NSSI often serves an emotion regulation function (Claes & Vandereycken, 2007; Klonsky, 2009), with interpersonal functions also reported by individuals (Nock & Prinstein, 2004). Research efforts have also focused on identifying psychological vulnerabilities, biological and environmental risk factors, and sociocultural variables (e.g., the media, Internet, peers) that may play a role in the development and maintenance of NSSI. While no empirically-supported treatments (ESTs) specifically designed for NSSI exist, some promising interventions have demonstrated effectiveness in reducing NSSI. Establishing evidence-based treatments for NSSI remains an important direction for future research.

NSSI is highly prevalent among adolescents and college students, and this review is intended to serve as a comprehensive guide for practitioners working with youth. This review aims to: (1) present the characteristics, prevalence rates, and demographic variables associated with NSSI; (2) discuss diagnostic classification of NSSI and psychiatric comorbidity; (3) explore the functions of NSSI; (4) review risk/vulnerability factors for NSSI and hypothesized etiological mechanisms; (5) present practical assessment strategies; and (6) evaluate the available psychosocial interventions, highlighting common elements across treatments. The high prevalence of NSSI among today’s youth warrants enhanced prevention efforts, adequate assessment of NSSI, and adoption of psychosocial interventions targeting this silent epidemic.
Characteristics and Prevalence of Non-Suicidal Self-Injury

Cutting or carving oneself with a sharp implement is the most common form of NSSI (Nock & Prinstein, 2005; Whitlock, Muehlenkamp, & Eckenrode, 2008). Most individuals report using multiple methods of NSSI, such as scratching or scraping, burning, inserting objects under the skin (e.g., safety pins), hitting oneself, biting oneself, picking at wounds, or hair-pulling (Nock, 2009). The frequency of NSSI episodes and the level of severity varies depending on the population, with community samples of adolescents and adults generally reporting having engaged in NSSI only a few times (e.g., less than 10 lifetime episodes; Whitlock et al., 2008), and inpatient psychiatric patients reporting engaging in NSSI more frequently (e.g., more than 50 episodes in one year; Nock & Prinstein, 2004). Higher frequency, use of multiple methods, and greater severity of NSSI is associated with increased suicide risk (Nock et al., 2006).

Research indicates that NSSI is often performed as a means of self-soothing or as an attempt at managing negative thoughts or emotions (e.g., Klonsky, 2007, 2009). Theoretical models posit that individuals who engage in NSSI are more emotionally dysregulated (Linehan, 1993a), and NSSI serves as a means of coping and/or affect regulation (Chapman, Gratz, & Brown, 2006; Nock & Prinstein, 2004). Research has documented the presence of negative thoughts and feelings preceding self-injury (e.g., Nock, Prinstein, & Sterba, 2010), and studies have shown that NSSI can lead to immediate reductions in negative affect (e.g., Klonsky, 2009).

Anecdotally, clinicians, educators, and health care professionals report that the prevalence rate of NSSI appears to have increased sharply in recent years (Whitlock, Eells, Cummings, & Purington, 2009). Hospital data point to an upward trend in the number of individuals admitted with cases of self-injury (both non-suicidal and associated with suicidality) over the past two decades (CDC, 2011). The total number of hospitalizations resulting from self-harm for all ages increased from 300,848 to 468,939 in the United States from 2001-2011 (CDC,
2011). Although evidence points to an increasing trend in self-injury, limited epidemiological data is available, and precise prevalence rates are difficult to ascertain. As a result of these difficulties in assessment, methodological differences, and lack of epidemiological data, the prevalence rate of NSSI has varied greatly across published studies.

Estimates of NSSI have differed depending on the sample, assessment methods, and definition of NSSI used to classify individuals. Limitations noted, approximately 13-45% of adolescents endorse lifetime prevalence of NSSI in school-based surveys (e.g., Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007), compared to 4% of adults in community samples (e.g., Briere & Gil, 1998). Rates are higher in clinical settings, with 40-60% of adolescents reporting lifetime NSSI (e.g., DiClemente, Ponton, & Hartley, 1991), compared to 19-25% of adults (e.g., Briere & Gil, 1998). A substantial number of college students report a history of NSSI, with 17% lifetime prevalence documented in a large Internet survey ($N = 2,875$; Whitlock, Eckenrode, & Silverman, 2006a), 12.8% lifetime prevalence reported in a large ethnically diverse college sample ($N = 5,651$; Kuentzel, Arble, Boutros, Chugani, & Barnett, 2012), and 7% of students in a large Internet-based survey reporting NSSI in the past four months ($N = 2,843$; Gollust, Eisenberg, & Golberstein, 2008). Despite a wide range in prevalence rates of NSSI, the available data strongly indicate that NSSI occurs at an alarmingly high rate among youth.

**Demographic Variables**

Differences in the prevalence of NSSI among certain populations have been observed. While some studies have found individual differences based on age, gender, sexual orientation, culture, and race/ethnicity, findings have been mixed for most demographic variables.

**Age of onset.** While most individuals report initial onset of NSSI between ages 12 and 15 (e.g., Muehlenkamp & Gutierrez, 2007), a recent study found that 25% of a sample of high school students reported NSSI prior to age 12 (Ross & Heath, 2002), and nearly 39% of young
adults in another study reported starting NSSI after age 17 (Heath, Toste, Nedacheva, & Charlebois, 2008). While the age of initial episode can vary between individuals, adolescence appears to be a critical period for the onset of NSSI. Moreover, records of hospital admissions for nonfatal violence show that NSSI peaks at ages 15-24 and then declines (CDC, 2011). Prevention, intervention, and treatment of NSSI among youth remains an important endeavor.

**Gender.** Although some studies have reported significant gender differences in NSSI, with higher rates of NSSI seen in females (e.g., Zlotnick, Mattia, & Zimmerman, 1999), the findings have been mixed. A number of studies have failed to detect gender differences in community, clinical, and college samples (e.g., Gratz, 2001; Serras, Saultes, Cranford, & Eisenberg, 2010). Gender differences in NSSI have been particularly pronounced in clinical samples (e.g., Zlotnick et al., 1999), which has caused some to speculate that this may be an artifact of females being more likely to seek treatment (Heath, Schaub, Holly, & Nixon, 2009). Additionally, the purported gender disparity may reflect differences in the methods used and the frequency of NSSI episodes. Females are more likely to cut or scratch themselves, while males are more likely to burn or hit themselves, and females may also engage in NSSI more frequently (Claes, Vandereycken, & Vertommen, 2007; Laye-Gindhu & Schonert-Reichl, 2005). Although it appears that some gender differences in NSSI are likely, research suggests that the magnitude of differences in prevalence may be exaggerated (Heath et al., 2009). Without reliable epidemiological data, the nature of gender differences in NSSI remains an open question.

**Sexual orientation.** Few studies have examined the relationship between sexual orientation and NSSI, and the available data have been mixed. Some studies have found homosexuality to be associated with higher rates of NSSI (e.g., Skegg, Nada-Raja, Dickson, Paul, & Williams, 2003), while others studies have not replicated these results (e.g., Whitlock et al., 2006a). This discrepancy may be due to inconsistent definitions of NSSI (e.g., including...
suicidal behaviors in the definition of self-injury) or varying methods of categorizing sexual orientation (e.g., comparing heterosexual individuals with individuals identifying as a sexual minority). For example, in a recent study, individuals identifying as bisexual or questioning their sexual orientation were more likely to have engaged in NSSI (Whitlock et al., 2006a). This highlights the importance of examining a more inclusive spectrum of sexual orientation (rather than exclusively using binary terms such as heterosexual and homosexual). Further research in this area is needed before more definitive conclusions can be made.

**Culture and race/ethnicity.** Limited cross-cultural studies of NSSI have been conducted, but extant research indicates that prevalence rates in other countries are generally comparable to the rates documented in the United States. For example, NSSI was reported by 6.2% of a sample of 3,757 high school students in Australia (DeLeo & Heller, 2004), 24.5% of a sample of 477 junior high school students in Japan (Izutsu et al., 2006), and 21.4% of 862 high school students in Turkey (Zoroglu et al., 2003). Additionally, a recent systematic review of 52 empirical studies on NSSI yielded an international prevalence rate of 16-18% among adolescents between ages 11 and 18 (Muehlenkamp et al., 2012a). Across clinical, community, and forensic populations, rates of self-injury are higher in Caucasians, relative to non-Caucasians (e.g., Maden, Chamberlain, & Gunn, 2000). However, findings have been mixed (e.g., Whitlock et al., 2006a), and like most other demographic variables, further studies are needed in this area.

**Diagnostic Classification of Non-Suicidal Self-Injury**

The earliest reports of self-injurious behavior can be traced back to Greek and Biblical times, yet until very recently this phenomenon had not been formally described in any standard diagnostic classification systems. For instance, in the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; APA, 2000)* and the current edition of the *International Statistical Classification of Diseases and Related Health Problems (ICD-10;*
WHO, 1992), self-injury is only listed in the criteria for BPD. The absence of proper taxonomy, and the obvious psychopathological importance of characterizing the syndrome, prompted the addition of NSSI disorder as a condition requiring further study in DSM-5 (APA, 2013).

**Non-suicidal self-injury disorder.** According to DSM-5, NSSI disorder is characterized by repeated intentional self-inflicted bodily damage in the absence of suicidal intent. To meet criteria for current NSSI disorder, an individual must have engaged in self-harm on five or more days in the past year, with one of the following expectations: to obtain relief from a negative feeling or cognitive state; to resolve an interpersonal difficulty; or to induce a positive feeling state (i.e., NSSI is used to regulate affect/cognition and/or serve social functions). In line with functional models of NSSI, the desired relief or response must be experienced during or shortly after engaging in NSSI. In addition, NSSI must be associated with at least one of the following: interpersonal difficulties or negative feelings/thoughts; a period of preoccupation with NSSI that is difficult to control; or frequent thoughts of NSSI, even when not acted upon. Lastly, the behavior cannot be socially sanctioned (e.g., part of a religious or cultural ritual), it must cause clinically significant distress or interference, and it cannot be better explained by another mental disorder or medical condition. See Appendix A for the full DSM-5 criteria for NSSI disorder.

Although NSSI has long been regarded as a “symptom” of borderline personality disorder (BPD), emerging research provides support for classifying NSSI disorder as a discrete diagnostic entity. In a sample of adolescent psychiatric patients, NSSI disorder was found to occur independently of BPD, and while there was overlap between the occurrence of NSSI disorder and BPD, this overlap was no greater than that of BPD and other disorders (e.g., mood or anxiety disorders; Glenn and Klonsky, 2013). Moreover, those meeting the proposed criteria for NSSI disorder had greater clinical impairment, regardless of BPD diagnosis.
To evaluate the validity of NSSI as a discrete disorder, another recent study compared the characteristics of the proposed NSSI disorder with BPD and other DSM Axis I diagnoses commonly encountered in clinical practice (Selby, Bender, Gordon, Nock, & Joiner, 2012). The majority of patients in a general practice clinic with lifetime NSSI did not exhibit subthreshold symptoms of BPD or personality disorder not otherwise specified (PDNOS). However, the NSSI group was characterized by high levels of depressive symptoms, anxiety, suicidality, and low functioning, relative to a clinical comparison group comprised of individuals with other Axis I diagnoses. The researchers concluded that NSSI was not accounted for by BPD or PDNOS.

In a large community sample of adolescents in Sweden (N = 3,060), 6.7% of participants met the proposed criteria for NSSI disorder (Zetterqvist, Lundh, Dahlstrom, & Svedinm, 2013), although changes were subsequently made to the diagnostic criteria for NSSI disorder. While a handful of studies have evaluated the prevalence of diagnosable NSSI disorder (e.g., Glenn & Klonsky, 2013; Selby et al., 2012; Zetterqvist et al., 2013), methodological limitations of these studies warrant further research in this area.

**Concurrent Psychiatric Conditions**

Research has consistently indicated high rates of comorbidity among individuals who self-injure (Whitlock et al., 2006a). Emotion dysregulation is a core feature of many of the conditions that have been correlated with NSSI, including eating disorders (Muehlenkamp, Peat, Claes, & Smits, 2012b), substance-related disorders (Cheetham, Allen, Yücel, & Lubman, 2010), mood and anxiety disorders (Hofmann, Sawyer, Fang, & Asnaani, 2012), and BPD (Brown, Comtois, & Linehan, 2002). It has been proposed that the use of NSSI as an affect regulation strategy may be particularly pronounced among individuals with comorbidity (Claes & Vandereycken, 2007; Klonsky, 2009). While research strongly indicates that the presence of psychopathology increases the probability of NSSI behavior (e.g., Briere & Gil, 1998; Kerr,
Muehlenkamp, & Turner, 2010), rates vary depending on the type and severity of comorbid disorder. Furthermore, NSSI may occur in the absence of psychiatric illness (Heath et al., 2008; Whitlock et al., 2008). Below we present the most common comorbid conditions that practitioners should consider during assessment of NSSI.

**Eating disorders.** Research indicates that NSSI often co-occurs with eating disorders (e.g., Muehlenkamp, Claes, Smits, Peat, & Vandereycken, 2011), with prevalence estimates of NSSI ranging from 18% to 40% among eating disordered patients (e.g., Claes, Vandereycken, & Vertommen, 2001). It has been proposed that disordered eating behaviors such as binging and purging can be prompted by negative emotions, comparable to the typical antecedents of NSSI (Jeppson, Richards, Hardman, & Granley, 2003). Research suggests that eating disorders and NSSI have shared vulnerability for emotion dysregulation (Muehlenkamp et al., 2012b).

**Substance-related disorders.** Relatively few studies have examined NSSI among individuals with substance-related disorders, but the available research suggests that approximately 25-30% of substance-abusing individuals report lifetime prevalence of NSSI (e.g., Evren et al., 2008; Langbehn & Pfohl, 1993; Whitlock et al., 2006a). It has been hypothesized that NSSI and substance abuse may share a common mechanism related to poor impulse control (Lacey, 1993). Practitioners should be aware that substance use has been thought to aid in the habituation to NSSI (Joiner, 2005), and the risk of lethal self-harm increases with substance abuse (Nock & Kessler, 2006). Adolescents and young adults are more likely to engage in risk-taking behaviors, such as substance abuse, excessive alcohol consumption, getting into automobile accidents, and inadequate use of contraceptives (Steinberg, 2007). Counselors working with young people should assess for these risky behaviors as part of NSSI assessment, especially among college students who are more likely to regularly engage in binge drinking and other drug use (Johnston, O’Malley, Bachman, & Schulenberg, 2013).
**Mood and anxiety disorders.** Numerous studies have found associations between NSSI and comorbid depression and anxiety (e.g., Hoff & Muehlenkamp, 2009; Jacobson, Muehlenkamp, Miller, & Turner, 2008; Klonsky et al., 2003; Ross & Heath, 2002; Whitlock et al., 2006a). It has been widely accepted that individuals with depressive disorders might engage in NSSI in an effort to regulate affect. However, recent research indicates that anxiety may play a stronger role in NSSI than depression (Klonsky et al., 2003). This highlights the importance of understanding the role of anxiety in NSSI, and the need for practitioners to consider anxiety management as a potential focus of treatment when working with individuals engaging in NSSI.

**Trauma and posttraumatic stress disorder.** Core features of posttraumatic stress disorder (PTSD) include exposure to trauma, re-experiencing symptoms, negative alterations in cognitions and mood, persistent avoidance of trauma-related stimuli, and hyperarousal (APA, 2013). Collectively, these symptoms can create a foundation that might precipitate NSSI as a means of managing trauma-induced distress. Theorists have proposed that higher rates of NSSI among individuals with PTSD may be more related to the emotional response to trauma, rather than the traumatic experience per se (Glassman et al., 2007). It has been posited that trauma and NSSI may be associated because they are correlated with the same psychiatric risk factors (e.g., family environment, dissociation, alexithymia, hopelessness; Klonsky & Moyer, 2008).

**Borderline personality disorder.** As previously mentioned, while the proposed NSSI disorder and BPD are considered discrete syndromes, these disorders exhibit strong comorbidity. As many as 75-80% of individuals with BPD have engaged in NSSI (e.g., Clarkin, Widiger, Frances, Hurt, & Gilmore, 1983; Cowdry, Pickar, & Davies, 1985), and individuals who engage in NSSI are more likely to exhibit borderline traits in general (e.g., Andover, Pepper, Raybchenko, Orrico, & Gibb, 2005; Klonsky, Oltmanns, & Turkheimer, 2003). The association between NSSI and BPD is not surprising, given that both conditions share core features of
negative emotionality and deficits in emotion regulation (Brown et al., 2002; Linehan, 1993b).
Many individuals with BPD report experiencing relief from unpleasant emotions after self-
injury, as well as decreased dissociative symptoms (e.g., Kemperman, Russ, & Shearin, 1997).

**Dissociation and dissociative disorders.** Dissociation refers to the subjective perception
of being psychological and/or physically disengaged from reality. It should be noted that
dissociative experiences are far more common than and distinct from dissociative disorders,
which are relatively rare, even in clinical populations (Star, 2011). The available research
indicates that up to 70% of individuals with dissociative experiences have engaged in NSSI (e.g.,
Evren, Sar, Evren, & Dalbudak, 2008; Gratz, Conrad, & Roemer, 2002). Some individuals report
a period of “emotional numbness” prior to engaging in NSSI, and in this context NSSI is used to
stop or prevent dissociation from occurring (Chapman et al., 2006).

**Suicide.** Although individuals who engage in NSSI are at higher risk of suicidal behavior
(Andover & Gibb, 2010; Langbehn & Pfohl, 1993), the relationship between NSSI and suicide is
nuanced and complex. By definition, NSSI differs from suicide on the basis of lacking lethal
intent (Nock & Favazza, 2009; Nock & Kessler, 2006), and some individuals report engaging in
NSSI as a means to resist acting on suicidal urges (Brown et al., 2002; Klonsky, 2009). Favazza
(1996) differentiates between suicidal individuals and those who engage in NSSI, by noting that
“a person who truly attempts suicide seeks to end all feelings, whereas a person who self-
mutilates seeks to feel better” (p. 262). Despite fundamental differences in the phenomenology,
functions, and intent between NSSI and suicide (Walsh, 2006), NSSI has been shown to increase
suicide risk, particularly in psychiatric populations (e.g., Whitlock et al., 2008). For example,
70% of adolescents with multiple inpatient admissions who had engaged in NSSI also reported a
lifetime history of at least one suicide attempt (Nock et al., 2006). Clearly, some individuals who
are diagnosed with NSSI disorder may still be at risk for suicide, and it is possible that labeling
someone with NSSI disorder might increase the likelihood that suicidality goes undetected. Therefore, adequate assessment of NSSI should also include suicide risk assessment.

Joiner (2005) has posited that NSSI may serve as “practice” for other potentially lethal behaviors through pain desensitization and habituation to self-inflicted harm. The risk of suicidality has been shown to increase as the frequency and severity of NSSI accelerates (Whitlock et al., 2008). Additionally, suicide risk is elevated among individuals who use multiple methods of NSSI (Nock et al., 2006). Individuals who engage in frequent NSSI may eventually turn to suicide if NSSI becomes less effective in regulation emotion (Walsh, 2006), and some may become suicidal as a result of isolation, thwarted belongingness, or perceived burdensomeness and incompetence (Joiner, 2005; Walsh, 2006). While NSSI and suicide are conceptualized as distinct behaviors, lifetime NSSI increases the likelihood of suicidality, underscoring the importance of suicide risk assessment among individuals engaging in NSSI.

Functional Model of Non-Suicidal Self-Injury

A functional approach to understanding psychological phenomena views behaviors as being caused by events immediately preceding and following the behavior in question. Knowing the antecedents and consequences of a particular behavior, such as NSSI, can provide insight into why someone might engage in the behavior, which may help guide treatment efforts. For example, identifying the functions of NSSI specific to each individual can inform treatment approaches, with interventions being targeted at replacing NSSI with more adaptive, yet functionally equivalent behaviors (Nock & Prinstein, 2004). Notably, the DSM-5 diagnostic criteria for NSSI disorder are consistent with a functional model of NSSI. While several theorists have adopted a function approach to explaining the development and maintenance of NSSI (e.g., Claes & Vandereycken, 2007; Favazza, 1996; Gratz, 2003; Klonsky, 2007), the four-factor model developed by Nock and Prinstein (2004) has been the most well-established. Nock and
Prinstein’s (2004) functional model emphasizes the immediate antecedents that lead to NSSI and the resulting consequences that maintain the behavior. Confirmatory factor analysis has supported the four-factor structure of the functions of NSSI (Brown et al., 2002; Nock & Prinstein, 2004; Lloyd-Richardson et al., 2007), and this model has been supported empirically in both adolescent (Nock & Prinstein, 2004, 2005) and adult populations (Brown et al., 2002).

In Nock and Prinstein’s model, NSSI can be viewed across two dimensions, representing automatic and social functions, both of which can be reinforced by positive or negative processes (Nock & Prinstein, 2004). In other words, NSSI can serve *intrapersonal* (e.g., affective regulation) and *interpersonal* (e.g., help-seeking) functions, with both positive and negative reinforcement processes maintaining the behavior (Nock, 2009, 2010). With *intrapersonal positive reinforcement*, NSSI precipitates desired thoughts or feelings (e.g., satisfaction, positive emotions), while with *intrapersonal negative reinforcement*, aversive thoughts or feelings are reduced or ceased after NSSI (e.g., relief, from distress, decrease in negative emotions). NSSI can also be maintained through *interpersonal positive reinforcement*, in which the behavior precedes a desired social event (e.g., attention, comfort), or *interpersonal negative reinforcement*, in which NSSI is followed by a decrease or cessation of some unwanted social event (e.g., peers stop bullying, parents stop arguing).

Nock and Prinstein’s (2004) integrative theoretical model of the development and maintenance of NSSI makes several propositions. First, NSSI is performed repeatedly because it immediately regulates affect/cognition and/or influences the social environment. Second, certain individuals may be more predisposed to have difficulties in emotion regulation, cognitive deficits, or inadequate social skills. For example, distal risk factors (e.g., genetic predisposition for high emotional/cognitive reactivity, childhood abuse, invalidating family environments), intrapersonal vulnerability factors (e.g., poor distress tolerance, high negative emotionality,
negative cognitive style), and interpersonal vulnerability factors (e.g., poor communication skills, deficits in social problem-solving) increase the likelihood that an individual will engage in NSSI. Finally, factors specifically related to self-injury (e.g., pain analgesia, self-punishment, social learning) may lead individuals to choose NSSI over other behaviors in order to serve the aforementioned intrapersonal and interpersonal functions (Nock, 2009, 2010). A number of risk/vulnerability factors for NSSI have been examined as the body of literature continues to grow. Many of these biological, environmental, psychological, and behavioral risk factors can be linked to the functional model proposed by Nock and Prinstein (2004). Below we present specific risk/vulnerability factors for NSSI along with proposed etiological mechanisms.

**Risk Factors and Proposed Mechanisms of NSSI**

From a biopsychosocial perspective, NSSI is viewed as resulting from a complex interaction between biological, environmental, affective, cognitive, and behavioral dimensions. For most individuals, all five interrelated and interdependent dimensions play an important role in the development and maintenance of NSSI (Walsh, 2006). Within this model, negative thoughts lead to negative emotions (and vice versa), which can lead to a variety of maladaptive coping strategies (e.g., alcohol or drugs, gambling, eating disorders), including NSSI.

**Biological factors.** A number of biological variables have been proposed to play a causal role in the etiology of NSSI. These biological factors include vulnerability to emotion dysregulation, altered physiological reactivity, changes in brain morphology, endogenous opioid system dysfunction, and diminished pain sensitivity (Groschwitz & Plener, 2012).

**Emotion dysregulation.** While studies exploring the biological underpinnings for high emotional/cognitive reactivity among individuals with a history of NSSI have produced mixed results, research generally points to genes involved in serotonergic neurotransmission, with lower levels of serotonin associated with NSSI (Groschwitz & Plener, 2012).
Physiological reactivity. Nock and Mendes (2008) provided objective evidence for increased physiological reactivity (measured by skin conductance) during a stress-induction task among individuals with a history of NSSI, relative to controls. Previous research has also shown decreased physiological arousal (measured by skin conductance) following script-induced imagery of NSSI (Haines, Williams, Brain, & Wilson, 1995). An altered cortisol response was observed in adolescents with a history of NSSI, when compared to healthy controls (Kaess et al., 2012), suggesting differences in physiological reactivity. While there have been divergent findings in the literature (e.g., Crowell et al., 2005), collectively the evidence seems to indicate some degree of altered physiological reactivity among individuals who engage in NSSI (Haines et al., 1995; Kaess et al., 2012; Nock & Mendes, 2008).

Changes in brain morphology. Neuroimaging studies have explored possible abnormalities in the brain morphology and neuronal activity in individuals with NSSI and/or borderline personality disorder (BPD). In a recent fMRI study, hyperarousal in limbic structures, including the amygdala and the anterior cingulate cortex, was found in individuals with BPD (Niedtfeld et al., 2010). Activation of the amygdala and the anterior cingulate cortex has been shown to decrease following pain induction (Schmahl et al., 2004) and imagining engaging in NSSI (Kraus et al., 2010). Although preliminary data point to changes in limbic structures in patients with NSSI and BPD, there is currently limited evidence supporting specific changes in brain morphology (Groschwitz & Plener, 2012).

Endogenous opioids. Endogenous opioid system dysfunction may also play a central role in maintaining NSSI. Many individuals report no physical pain during NSSI (e.g., Favazza, 1996; Nock & Prinstein, 2005), and the sense of relief often reported following NSSI may result from the powerful endorphin release triggered by NSSI. Lower levels of endogenous opioids have been found in individuals who repeatedly engage in NSSI (Sher & Stanley, 2008), a finding
that could help explain the proposed “addictive” nature of NSSI (Groschwitz & Plener, 2012).

**Pain tolerance.** Research has documented diminished pain sensitivity under conditions of distress among individuals with a history of NSSI (e.g., Bohus et al., 2000b; Gratz et al., 2011; Kemperman et al., 1997; Russ, Campbell, Kakuma, Harrison, & Zanine, 1999). This higher threshold for physical pain is thought to result from habituation, the release of endorphins during NSSI, or beliefs about deserving to be injured (Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). It has also been posited that some individuals may use physical pain associated with NSSI to distract from emotional pain, thus regulating emotion (e.g., Gratz et al., 2011).

**Environmental factors.** Walsh (2006) delineates three basic categories that constitute the environmental dimension contributing to the occurrence of NSSI, including: family historical elements, individual historical elements, and current environmental elements.

**Family historical elements.** Family historical elements represent observed events that have not been directly experienced by the individual (e.g., observing suicidal behavior in a family member). A number of family historical events have been associated with NSSI, including a family member’s mental illness, substance abuse, suicide, and domestic violence in the family (Walsh, 2006). Observation of self-destructive behavior has been proposed to be particularly damaging, which may prompt individuals to come to believe that NSSI is a viable option for dealing with challenges in life and regulating affect (Walsh, 2006).

**Individual historical elements.** Several individual historical elements (i.e., direct personal experiences) have been linked to NSSI, including: invalidating family environments, childhood adversities and maltreatment, and direct exposure to NSSI (Walsh, 2006).

**Invalidating family environments.** According to Linehan’s (1993a) biosocial theory, problems with emotion dysregulation arise from a transaction between a biological emotional vulnerability combined with a pervasive invalidating environment. Linehan’s (1993a) model was
initially developed to explain the etiology of BPD, but this theory can be applied more broadly to encompass the deleterious effects of invalidation on subsequent NSSI behavior. In an invalidating family environment, a child’s emotional experience is ignored, denied, ridiculed, trivialized, or condemned, which can lead an individual to question the accuracy and validity of their own internal feeling states (Linehan, 1993a, 1997). Invalidating moments (e.g., making an infant wait for prolonged periods of time for a feeding or diaper change, laughing at or mocking a child in pain, or not permitting a child to express anger or frustration), serve to teach children that their internal experiences and inner thoughts are unimportant and unacceptable (D’Onofrio, 2007). This process reinforces maladaptive behavior and can result in profound emotion dysregulation. Moreover, caregivers who are insensitive and inconsistent provide fewer opportunities for children to develop effective emotion regulation strategies (Sim et al., 2009). Children who grow up in an invalidating environment do not learn how to adaptively regulate intense emotions, which often leads these individuals to rely on short-term, impulsive, self-invalidating coping behaviors to manage emotional distress, including NSSI (Sim, Adrian, Zeman, Cassano, & Friedrich, 2009; Walsh, 2006).

*Trauma and abuse.* A strong association between trauma (e.g., childhood abuse) and NSSI has been repeatedly found in the literature (Connors, 1996; Glassman, Weierich, Hooley, & Nock, 2007; Gratz et al., 2002; Tyler, Whitbeck, Hoyt, & Johnson, 2003; Wachter, Murphy, Kennerly, & Wachter, 2009; Weierich & Nock, 2008). For example, a large recent survey study of college students \( n = 2,875 \) found that 53.3% of individuals who reported NSSI also reported having experienced physical (12%), sexual (20%), and/or emotional (44%) abuse (Whitlock et al., 2006a). As previously mentioned, the response to trauma, and more specifically how an individual copes with stress, may be more predictive of NSSI than the presence of trauma itself (Glassman et al., 2007).
Recent theories posit that childhood abuse may be best conceptualized as a proxy risk factor for NSSI (Klonsky & Moyer, 2008), and that trauma may contribute to the initiation of NSSI through mediating variables that are correlated with both abuse and NSSI, such as depression or anxiety (Klonsky et al., 2003). Certain biological (e.g., serotonin hypoactivity, genes) and psychosocial variables (e.g., family dysfunction, parental neglect and maltreatment, psychopathology) are believed to act independently or interact with childhood sexual abuse to increase the likelihood of NSSI and suicide (Maniglio, 2011). Support for this theory comes from a recent meta-analysis, indicating that of the 43 studies included in the analysis, those that controlled for variables such as family environment, dissociation, alexithymia, hopelessness, and BPD, found minimal or negligible relationships between abuse and NSSI (Klonsky & Moyer, 2008). Although studies have found relatively small associations between childhood sexual abuse and NSSI, and other risk factors may play a more significant role in the occurrence of NSSI, practitioners are still wise to consider childhood sexual abuse as a significant risk factor for NSSI and suicide (Maniglio, 2011).

 Exposure to non-suicidal self-injury. Direct exposure to NSSI has been shown to increase the likelihood of NSSI among adolescents (e.g., Nock & Prinstein, 2005; Whitlock et al., 2006b). Peer relationships become highly important during the transition into adolescence, and the phenomenon of “peer contagion” describes the effect of peers on the development, maintenance, and exacerbation of maladaptive behaviors such as NSSI (Heilbron & Prinstein, 2008; Prinstein et al., 2010). Adolescents are more likely to look to peers as models for social comparison and identity development. For some individuals, NSSI may provide powerful interpersonal (social) positive reinforcement (Nock & Prinstein, 2004, 2005), such that admiration or attention is gained from engaging in risk-taking behaviors like NSSI. With the proliferation of the Internet over the past two decades, individuals can now easily connect any time of day, which may
amplify peer influences on NSSI behavior. Young people, adolescents in particular, communicate and socialize on the Internet more than any other age group (Gross, 2004), and online communities provide an avenue for disclosing personal information to others who may be experiencing similar difficulties. Not surprisingly, research has indicated that many individuals report learning about NSSI from peers, books, and the Internet (Hodgson, 2004).

In recent years, the role of social media in the development and course of NSSI has received increased scientific attention. Some individuals struggling with NSSI may communicate online as a way to receive support and validation, which can be seen as beneficial (Lewis & Arbuthnott, 2012). However, research has shown that some online representations of NSSI (e.g., self-harm message boards, forums, websites) may serve to normalize or reinforce the behavior (Whitlock et al., 2006b). Moreover, viewing graphic imagery depicting NSSI could initiate urges to engage in the behavior, and individuals may also become triggered by reading text descriptions of NSSI (Lewis & Baker, 2011). Additional concerns about the NSSI content available on the Internet stem from studies showing that individuals (especially adolescents and young adults) share NSSI methods and strategies for concealing NSSI through online communication (Whitlock et al., 2006b). In addition to helpful resources for treating NSSI that are available on the Internet, numerous websites actually promote self-harm as a viable method for regulating emotional distress (Lewis & Baker, 2011), similar to the “pro-ana” and “pro-mia” communities that support active eating disorders (Rodgers, Skowron, & Chabrol, 2011).

Research strongly suggests that for some individuals the Internet can provide the initial exposure to NSSI and the behavior may be reinforced through participation in virtual communities that support NSSI (Jarvi, Jackson, Swenson, & Crawford, 2013).

**Current environmental elements.** Stressful life events, such as losses (e.g., death, divorce), interpersonal conflicts and rejection, academic and occupational failures, or trauma and
violence, can precipitate tension and negative emotionality, and some individuals may seek relief, control, or attention by engaging in NSSI (Miller & Brock, 2010). In particular, individuals with a significant history of both familial and individual experiences with adversity may be more negatively affected by current events that are similar to past adverse conditions (Walsh, 2006). For example, someone who experienced the death of a parent at a young age may be particularly sensitive to losses in relationships later in life. Moreover, individuals with complicated and highly aversive historical experiences may be more vulnerable to present negative events in general (Walsh, 2006).

**Emotional factors.** Theoretical models, such as the functional model of self-injury (Nock, 2009; Nock & Prinstein, 2004, 2005) and the experiential avoidance model (Chapman et al., 2006), posit that individuals who engage in NSSI are more emotionally dysregulated, and NSSI is used as a means of coping with intense negative emotions (Chapman et al., 2006; Darche, 1990; Klonsky, 2007, 2009). As mentioned repeatedly throughout this review, NSSI seems to serve an important emotion regulation function for many individuals. The presence of comorbidity, particularly disorders involving emotion dysregulation, may make NSSI more rewarding and reinforcing for some individuals.

**Affect regulation.** A wide range of negative emotions have been reported to precipitate NSSI behavior, including anger, contempt, guilt, grief, sadness, shame, and worry (Alderman, 1997). A recent study using real-time ecological momentary assessment (EMA), found that adolescents and young adults were likely to have thoughts of engaging in self-harm when they were alone and experiencing negative feelings or thoughts (e.g., self-hatred, anger, feeling numb, bad memories) in response to a stressful event (Nock et al., 2010).

Linehan (1993a) suggests that an inability to tolerate negative emotions is a significant contributor to maladaptive, impulsive, and destructive behavior in individuals with BPD, and this
theory can also translate to NSSI. It has been proposed that individuals may self-harm as a method of coping or regulating emotion during times of increased distress (Daughters, Sargeant, Bornovalova, Gratz, & Lejuez, 2008). Consistent with the theory that NSSI often functions to help individuals escape or avoid negative emotions, NSSI has been associated with unwillingness to experience emotional distress (as indexed by time to termination on a frustration-induction task), as well as heightened physical pain tolerance under conditions of interpersonal distress (Gratz et al., 2011).

The affective regulation function of NSSI has been further supported by studies showing that NSSI can lead to immediate reductions in negative affect. In a recent study, NSSI was associated with improvements in affect and decreases in emotional arousal among young adults (Klonsky, 2009). Prior to engaging in NSSI, participants reported experiencing negative emotions (e.g., feeling overwhelmed, sad, frustrated), and after NSSI they felt calm and relieved. Interestingly, NSSI was predominantly associated with reductions in negative affect, rather than increases in positive affect (Klonsky, 2009). However, other studies have also shown increases in positive emotions following NSSI (e.g., Muehlenkamp et al., 2009).

**Cognitive factors.** While cognitions and emotions are seen as two different dimensions in Walsh’s (2006) biopsychosocial model, it is important to recognize that cognitions and emotions are often closely linked. Consistent with a transactional cognitive-behavioral approach, emotions can arise in response to distorted and irrational cognitions (and vice versa), which in turn impacts behavior, and behaviors can influence emotion and cognition (Hofmann, 2011). Cognitive vulnerability, specifically negative cognitive style, has been proposed as a risk factor for NSSI. The cognitive process of rumination has also been implicated in NSSI behavior.

**Negative cognitive style.** The construct of negative cognitive style encompasses dysfunctional attitudes and beliefs, and also reflects a negative inferential and attributional style.
Individuals with a negative cognitive style tend to generate pessimistic internal and global attributions about negative events and infer negative consequences from these events (Abramson, Metalsky, & Alloy, 1989). This cognitive vulnerability has been conceptualized as a distal risk factor for NSSI. Support for this theory has been provided by a recent longitudinal study demonstrating that adolescents with a negative cognitive style (assessed at baseline) were more likely to engage in NSSI 2.5 years later (Hankin & Abela, 2011). Another recent study found that cognitive vulnerability and stress interacted to prospectively predict NSSI trajectories, such that high cognitive vulnerability and high levels of stress lead to NSSI behavior, while high levels of stress did not predict NSSI in individuals who were more optimistic (Guerry & Prinstein, 2010).

Distorted thinking patterns have been implicated in a number of psychological disorders, including depression (Beck, 1963), anxiety (Beck, Emery, & Greenberg, 2005), and eating disorders (Shafran, Teachman, Kerry, & Rachman, 1999), to name a few. Not surprisingly, individuals who engage in NSSI also demonstrate cognitive distortions, including irrational thoughts in response to environmental events and self-generated negative cognitions that are triggered by internal cues (Walsh, 2006). For example, individuals with a history of sexual abuse (an environmental event) may have cognitive distortions focused around self-blame (e.g., “It was my fault because I should have done something to stop the abuse from happening.”), and evidence suggests that individuals high in self-blame and self-derogation are at greater risk of NSSI (Klonsky, 2007; Klonsky & Glenn, 2009). However, individuals may also develop cognitive distortions in the absence of environmental triggers. For example, an individual may commonly have thoughts about self-hatred, with no particular environmental event leading to these thoughts. Learning to identify, evaluate, and eventually replace dysfunctional negative cognitions with more adaptive and objective thoughts may be an important focus in treatment for certain individuals demonstrating a negative cognitive style. Cognitive restructuring will be
discussed further in the section on psychosocial interventions for NSSI.

**Rumination.** The cognitive process of rumination is a mode of responding to distress that involves the repetitive and passive focus of attention on one’s thoughts and emotions (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Rumination has been shown to exacerbate depression, increase negative emotion, and impair problem solving (Thomsen, 2006). Rather than actively solving problems, individuals who become engaged in rumination remain fixated on their problems without taking action (Nolen-Hoeksema et al., 2008). A ruminative cognitive style may increase vulnerability to NSSI, as many individuals report engaging in NSSI as a means to obtain relief from negative thoughts and emotions (Nock & Prinstein, 2004). In a recent study among college students, individuals with a history of NSSI endorsed more rumination, relative to controls (Hoff & Muehlenkamp, 2009). In another study among adolescent girls, rumination was significantly associated with NSSI (Hilt, Cha, & Nolen-Hoeksema, 2008). Targeting rumination and teaching emotion regulation strategies may enhance treatments for NSSI. Dialectical behavior therapy (DBT) is one intervention that has been shown to reduce impulsive and suicidal behaviors by helping individuals develop more adaptive emotion regulation skills (Linehan, 1993a). DBT also teaches mindfulness skills, which can help individuals combat rumination by learning to focus on the present moment (Linehan, Cochran, & Kehrer, 2001), thereby reducing the need to engage in NSSI.

**Behavioral factors.** The behavioral components of a biopsychosocial model of NSSI include overt actions that occur before, during, and after NSSI. When assessing for antecedents and consequences of NSSI, it is important to gather information about temporally distant and more immediate antecedents and consequences that reinforce and maintain NSSI (Miller & Brock, 2010). Typical behavioral antecedents of NSSI include relational conflicts, failure, isolation, withdrawal, sexual behavior, substance use, and disordered eating (Walsh, 2006).
Other behavioral factors include actions that prepare an individual for NSSI, such as choosing a private location to engage in NSSI and selecting a particular method. Some individuals report experiencing relief after NSSI, while others remain dysregulated and may seek other forms of tension release (Klonsky, 2009). Identifying the antecedents and consequences of NSSI can provide valuable information about the functions of NSSI. As such, a thorough functional assessment of NSSI is a crucial component of effective case formulation and treatment planning.

Assessment of Non-Suicidal Self-Injury

Some have expressed concern that assessing for NSSI might lead individuals to engage in the behavior, and similar ethical and legal issues have been raised regarding suicide research (e.g., Mishara & Weisstub, 2005). These concerns have largely been unfounded. In fact, studies have shown that asking questions about suicide or NSSI does not increase the likelihood of self-injurious thoughts or behaviors and does not lead to increased levels of distress (Cukrowicz, Smith, & Poindexter, 2010; Gould et al., 2005; Reynolds, Lindenboim, Comtois, Murray, & Linehan, 2006). Nonetheless, Nock (2009) suggests that assessment of self-injurious thoughts and behaviors follow the assessment of less sensitive material, such as symptoms of anxiety or depression, and gradually transitioning to the topics that may be more difficult to discuss.

Recommended practice guidelines for the assessment of NSSI suggest that practitioners approach the evaluation in a “low-key, dispassionate demeanor” (Walsh, 2007) that coveys a “respectful curiosity” about the behavior (Kettlewell, 1999). Responding to a client’s reports of NSSI with an alarmed reaction or judgment is not helpful, but effusive expressions of support are also ill advised, as such responses may inadvertently reinforce the behavior (Walsh, 2007). It is recommended that clinicians adopt a “matter-of-fact line of inquiry” (Kerr et al., 2010) that blends genuine interest in the client along with compassion (Miller & Brock, 2010). It is also helpful to adopt the client’s own terminology when referring to NSSI (Walsh, 2006). Adopting a
client’s language lets them know they have been heard, communicates understanding and validation, which can be empowering. The initial evaluation sets the tone for treatment, and certain approaches are more effective than others. Effective assessment not only gathers relevant information, but also incorporates validation and promotes client engagement by conveying a non-judgmental stance, while evaluating and strengthening motivation to change, even before treatment begins. The same principles, guidelines, and recommendations for assessing NSSI also apply to treating NSSI, regardless of the specific therapeutic interventions being used.

**Validation.** It is widely accepted that validating of feelings can help foster a positive therapeutic alliance (Nafisi & Stanley, 2007). Validation involves communicating an understanding of a client’s experiences from his or her perspective, and accurate reflective listening is an essential validation strategy (Linehan, 1997). Reflective listening involves paraphrasing a client’s expressed thoughts, identifying emotions and potential deeper thoughts, and interpreting thoughts, feelings, and behaviors in light of contextual factors (Miller & Rollnick, 2013). Therapists can validate clients by actively conveying acceptance and communicating that behaviors (even maladaptive ones) make sense in light of current circumstances (Linehan, 1993a). Clearly, validation is a helpful therapeutic tool in general, but validation may serve an even more crucial role when working with individuals that engage in NSSI, many of whom may have grown up in neglectful or abusive environments.

**Assessing and enhancing motivation to change.** Incorporating motivational interviewing (MI) techniques into assessment of NSSI can not only be useful in eliciting information, but also helps to stimulate the change process (Miller & Rollnick, 2013). Appropriately framed questions based on MI principles can enhance understanding of NSSI from the client’s perspective, facilitate a thorough risk assessment, and prompt the client to start considering motivations for change (Kress & Hoffman, 2008). Consistent with the MI approach,
Kerr and colleagues (2010) recommend using open-ended questions to explore the following areas during assessment: the effects, functions, and disadvantages of NSSI; motivations to stop engaging in NSSI; perceived benefits to cessation of NSSI; and treatment expectancies.

**Methods of assessment.** A variety of NSSI assessment methods are available, including self-report questionnaires, inventories, and clinical interviews (structured, semi-structured, and open-ended). Regardless of the instrument or method used for evaluation, it is essential to conduct a thorough assessment of the immediate risk of harm NSSI poses as well as information about suicidal intent, motivations, and functions of NSSI.

**Self-report instruments.** Well-designed self-report measures of NSSI are useful in clinical practice because they offer a systematic, objective, efficient, and cost-effective means of gathering considerable relevant information in a timely manner (Cloutier & Humphreys, 2009). Although the risk of response bias is inherent in any self-report measure (Furnham & Henderson, 1982; Howard & Dailey, 1979), the use of structured interviews as an adjunct to paper and pencil assessments may help minimize this risk. Below are several self-report measures that assess NSSI. Refer to Cloutier and Humphreys (2009) for detailed descriptions and information about the psychometric properties of these instruments.

- **Deliberate Self-Harm Inventory (DSHI; Gratz, 2001)**
- **Motivations Underlying Self-Harm Questionnaire** (Laye-Gindhu & Schonert-Reichl, 2005)
- **Ottawa Self-Injury Inventory (OSI; Cloutier & Nixon, 2003)**
- **Self-Harm Behavior Questionnaire (SHBQ; Gutierrez, Osman, Barrios, & Kopper, 2001)**
- **Self-Harm Inventory (SHI; Sansone, Wiederman, & Sansone, 1998)**
- **Self-Harm Survey** (Laye-Gindhu & Schonert-Reichl, 2005)
- **Self-Injury Inventory (SII; Zlotnick et al., 1997)**
- **Self-Injury Motivation Scale (SIMS; Osuch, Noll, & Putnam, 1999)**
Clinical interviews. While individual interviews can vary in length, structure, and degree of formality, in general this form of assessment tends to be more flexible and open-ended, as compared to more restrictive self-report questionnaires (Miller & Brock, 2010). Structured interviews provide standardized instructions and procedures, and can be used for diagnostic assessment as well as identifying specific treatment targets. The Suicide Attempt and Self-Injury Interview (SASII; Linehan, Comtois, Brown, Heard, & Wagner, 2006) and the Self-Injurious Thoughts and Behaviors Interview (SITBI; Nock, Holmberg, Photos, & Michel, 2007) are structured interviews for assessing NSSI that have been widely used in both research and clinical contexts. Both the SASII and SITBI have been shown to have adequate reliability and validity (e.g., Cloutier & Humphreys, 2009).

The SASII contains 42 open-ended, checklist, forced-choice, Likert-type, and yes/no questions, and is comprised of six subscales: emotion relief, interpersonal influence, lethality, rescue likelihood, suicide communication, and suicide intent. The SASII is in the public domain and can be accessed along with instructions and scoring syntax directly from Linehan’s Behavioral Research and Therapy Clinics website through the University of Washington.

The SITBI is a 169-item structured interview that assesses the presence, frequency, and characteristics of a range of suicidal (ideation, plans, gestures, and attempts) and non-suicidal self-injurious thoughts and behaviors. Each section on the SITBI begins with a screening question about the presence of certain thoughts or behaviors. If a respondent replies “no” to any of these initial screening questions, the remainder of that particular section is skipped. The SITBI is also in the public domain and is available through the website for Nock’s Laboratory for Clinical and Developmental Research at Harvard University.

Assessment domains. Whether utilizing self-report instruments, structured, semi-structured, open-ended interviews, or a combination of methods, a thorough assessment will
cover the following domains: history and recent episodes of self-injury (including suicide risk assessment), functional assessment of NSSI (including antecedents and consequences), and other relevant factors (e.g., comorbid conditions, body-image, adverse life events).

**History of self-injury.** Important historical areas to cover include the age of onset of NSSI, methods used (e.g., cutting, scratching, burning, hitting), frequency of NSSI episodes, average number of wounds per episode, location of wounds on the body, duration of each episode, and severity of physical damage resulting from NSSI (Walsh, 2007). It is also crucial to assess for other forms of direct and indirect self-harm, such as past history of suicidality (suicidal ideation, attempts, plans, gestures), substance abuse, disordered eating, and risky sexual behaviors (Miller & Brock, 2010).

**Recent self-injury.** In addition to inquiring about past NSSI behaviors, a thorough assessment will include details about current NSSI. Assessment of recent self-injury will cover many of the same areas previously discussed under past history of self-injury (e.g. methods, frequency, number of wounds, location of wounds, duration, severity) with a few additions, including a functional analysis of a recent episode (e.g., asking the client to describe what led up to the NSSI, where they were, what implements were used, social context, any thoughts or feelings associated with NSSI), and specific information about when NSSI is most likely to occur (e.g., time of day, location, common triggers).

**Antecedents.** In line with a functional approach to assessing NSSI (Nock & Prinstein, 2004, 2005), it is important to inquire about antecedents that precipitate episodes of NSSI as well as the resulting consequences of the behavior. From a functionalist perspective (Claes & Vandereycken, 2007), NSSI behavior can be viewed as an attempt to cope with distress (problem-solving function) or an expression of distress (communicative function). Antecedents may include environmental, biological, and psychological triggers (Walsh, 2006).
Environmental antecedents can include, but are not limited to, problems such as: relational conflicts; failure in academic, occupational, or social domains; or everyday life experiences that may trigger memories of past traumas or adverse events. It can be helpful to identify biological antecedents that are likely to lead to NSSI, such as fatigue, insomnia, illness, and intoxication. Psychological antecedents include cognitive (e.g., negative automatic thoughts, beliefs about NSSI), affective (e.g., intense emotions, negative emotionality), and behavioral factors (e.g., NSSI habits, rituals). It can be particularly helpful to determine the earliest identifiable antecedents that preempt NSSI episodes (i.e., conduct a chain analysis), in order to pinpoint early signs of NSSI that can then be redirected more effectively in the future, rather than trying to resist engaging in NSSI when strong urges are already present (Walsh, 2006).

Consequences. As with antecedents to NSSI, the aftermath of NSSI can be broken down into environmental, biological, and psychological consequences (Walsh, 2006). Environmental consequences refer to any social interactions that follow NSSI (e.g., others noticing NSSI), with a particular focus on any social reinforcement that may occur following NSSI. Biological consequences describe any physical changes following NSSI, such as physical pain experienced during or after NSSI, the degree of wound care performed (e.g., inadequate wound care as a deliberate attempt to delay healing), or the presence or absence of excoriation (i.e., picking or scratching open wounds to prevent healing). Psychological consequences pertain to the state of mind of the individual following an episode of NSSI (e.g., remorseful, neutral, or pleased), the degree of emotional relief (e.g., decrease in distress), and any aftermath behaviors (e.g., covering arms to hide evidence of NSSI) that follow episodes of NSSI (Miller & Brock, 2010).

Other relevant factors. In addition to assessing for history, recent episodes, antecedents, and consequences of NSSI, it may be useful to inquire about psychiatric comorbidity, particularly conditions that may warrant intervention along with NSSI treatment (e.g., clinically
significant mood or anxiety disorders, substance-related disorders, eating disorders, trauma-related disorders), self-image and body-image, and relevant historical elements (e.g., childhood abuse or neglect, traumatic events, psychiatric disorders in first degree relatives). As with all clinical assessments, it can also be useful and informative to ask the client at the end of the evaluation if there is anything else that seems relevant to mention.

**STOPS FIRE.** Clinicians may find it helpful to use the mnemonic device “STOPS FIRE” as a guide to remember important areas to cover when evaluating risk for NSSI. The specific domains of NSSI captured by STOPS FIRE are listed below (Kerr et al., 2010, pp. 246-247):

- Suicidal ideations during or before self-injury
- Types of self-injury in which the patient engages
- Onset of self-injury
- Place (location) on the body that is injured
- Severity and extent of damage caused by self-injury
- Functions of the self-injury for the patient
- Intensity or frequency of self-injury urges
- Repetition of self-injury
- Episodic frequency of self-injury

**Psychosocial Interventions for Non-Suicidal Self-Injury**

As Muehlenkamp (2006) postulated, “given that non-suicidal self-injury is primarily conceptualized as a tool for emotion regulation (Linehan, 1993a; Nock & Prinstein, 2004) maintained through positive and negative reinforcements, treatments utilizing cognitive-behavioral strategies show the greatest promise for successfully reducing the behavior” (p. 167). While the available research seems to support this notion, few studies have specifically targeted
NSSI behaviors as a main treatment outcome, and further empirical research on psychosocial treatments for NSSI (particularly among adolescents) is needed before more definitive conclusions can be made. Ethical and legal risks have contributed to many treatment outcome studies excluding suicidal or self-harming individuals, and the majority of published treatment studies have used adult samples (Muehlenkamp, 2006). Although there are currently no ESTs that have been specifically designed for treating NSSI, dialectical behavior therapy (DBT; Linehan, 1993a, 1993b) has undergone more scientific scrutiny than any other treatment that has been applied to individuals who engage in NSSI. The following is not intended to be an exhaustive review of all treatment options for NSSI; rather, we will primarily present data on DBT, as it represents the psychosocial intervention with the most empirical support. We will also briefly discuss an alternative treatment for NSSI that has shown limited empirical support: manual-assisted cognitive behavioral therapy (MACT; Evans et al., 1999).

**Dialectical behavior therapy.** Born out of the cognitive behavioral tradition, DBT is an action-oriented, skills-based treatment that was developed for treating chronic suicidality and parasuicidal behaviors (including NSSI) among individuals with BPD (Linehan, 1993a). DBT blends principles of Zen Buddhism (mindfulness), cognitive-behavioral techniques, and problem-solving skills-training. A central principle underlying DBT is maintaining a delicate balance between acceptance and validation of the client, while encouraging positive behavioral change (Linehan, 1993a). DBT aims to reduce NSSI and suicidal behaviors by helping clients develop alternative, more adaptive coping strategies. Traditional DBT is a comprehensive treatment that incorporates several modalities, including 12 months of weekly individual therapy, concurrent weekly group psychosocial skills training, telephone consultation for skills coaching between sessions, and team supervision for therapists (Ivanoff, Linehan, & Brown, 2001). Throughout treatment, the DBT therapist must balance “compassionate flexibility” with a
“benevolently demanding” approach, and a nurturing style (Dimeff & Linehan, 2001).

To reduce self-destructive behaviors, such as NSSI, therapists use functional analysis to explore antecedents and consequences of life-threatening behaviors, and clients are taught a number of behavioral skills that are broken into four modules: core mindfulness, interpersonal effectiveness, emotion regulation, and distress tolerance, (Linehan, 1993a, 2015). The core mindfulness module teaches clients how to take hold of their own mind with “what” skills: learning to observe their experience, describe what they notice, and fully participate in their lives; and “how” skills: learning to operate non-judgmentally, one-mindfully (i.e., concentrating on doing one thing at a time), and effectively (Ivanoff et al., 2001; Linehan, 1993b).

Interpersonal effectiveness skills include assertiveness, relationship effectiveness, and self-respect effectiveness (Linehan, 1993b). Goals of emotion regulation training include learning to identify and understand emotions, reduce emotional vulnerability, and decrease emotional suffering (Linehan, 1993b). The distress tolerance module teaches clients crisis survival techniques, including: distraction, self-soothing with the five senses, strategies for improving the moment, and listing the pros and cons of tolerating and not tolerating distress (Linehan, 1993b).

DBT was first evaluated in a randomized, controlled trial (RCT) comparing DBT to treatment as usual (TAU) in a sample of chronically suicidal women with BPD (Linehan, Armstrong, Suarez, Allmon, & Heard, 1991). The women who received DBT had significantly lower rates of NSSI at each assessment point (every four months over the course of treatment and one year post-treatment). Additionally, women in the DBT group were significantly less likely to have engaged in self-injurious behavior in the first six months after treatment, relative to the TAU group (Linehan, Heard, & Armstrong, 1993). Several subsequent RCTs have reported similar differences between DBT and TAU conditions, demonstrating significant reductions in self-harm behavior up to six months post-treatment (Koons et al., 2001; Linehan et al., 2002;
Verheul et al., 2003). However, significant differences favoring DBT over TAU on rates of self-harm have not been sustained beyond 12 months post-treatment (Linehan et al., 1993; Verheul et al., 2003), which may be due to the low rates of NSSI found in both treatment groups (DBT and TAU) at follow-up (Sheel, 2000). In a recent RCT comparing DBT to “nonbehavioral or psychodynamic” therapy by experts for suicidal behavior and BPD, DBT was shown to be more effective in reducing suicide attempts, suicidal ideation, and medical risk, but both treatments were equally as effective in reducing NSSI (Linehan et al., 2006).

In addition to RCTs, a number of quasi-experimental studies have provided support for the efficacy of DBT in reducing NSSI (e.g., Barley et al, 1993; Bauserman, 1998; Bohus et al., 2000a; Koons et al., 2001; Low, Jones, Duggan, Power, & MacLeod, 2001; Shearin & Linehan, 1992; Turner, 2000). However, at least one study comparing DBT to TAU among inpatients failed to reduce NSSI (Springer, Lohr, Buchtel, & Silk, 1996), although methodological concerns may have contributed to the lack of significant results (Muehlenkamp, 2006). While these findings strongly suggest that DBT is an effective treatment for reducing NSSI, more research is required to determine whether treatment gains attributable to DBT can be maintained over time, and if DBT is as effective in treating NSSI in other populations besides individuals with BPD.

The standard intensive DBT protocol developed by Linehan (1993a, 1993b) has been modified for use with adolescents with positive results (Katz, Cox, Gunasekara, & Miller, 2004; Miller, 1999; Miller, Rathus, Linehan, Wetzler, & Leigh, 1997). Miller, Rathus, and colleagues (2000, 2002) tested a brief, 12-week DBT program that reduced the number of skills taught and incorporated family members in skills training. In the sample of outpatient adolescents with BPD features, the adaptation of DBT was shown to significantly reduce suicidal ideation and hospitalizations, relative to a TAU group, although data regarding NSSI was not provided (Miller, Wyman, Huppert, Glassman, & Tathus, 2000; Rathus & Miller, 2002). Katz and
colleagues (2004) tested a 2-week modified DBT program for adolescent inpatients that consisted of daily skills training and individual DBT. Results indicated that the brief intervention significantly reduced self-harming behaviors and suicidal ideation (Katz et al., 2004).

Collectively, the studies reviewed indicate that DBT is effective in treating NSSI, particularly among individuals with BPD. The extant research suggests that DBT is likely to reduce NSSI and suicide risk during the course of treatment and these gains are likely to be maintained beyond termination, especially with further intermittent contact with treatment providers (Linehan et al., 1991, 1993, 2006; Koons et al., 2001).

**Manual-assisted cognitive behavioral therapy.** MACT is a 6-session cognitive-behavioral, solution-focused intervention that teaches clients skills to manage emotions and counter negative thinking through individual psychotherapy and self-directed bibliotherapy (Evans et al., 1999). In a randomized controlled pilot study, MACT was shown to be effective in reducing monthly rates of NSSI and increasing the time between episodes of NSSI, relative to controls randomly assigned to receive TAU, but neither of these differences reached statistical significance (Evans et al., 1999). A larger multi-site RCT comparing MACT to TAU failed to demonstrate significant reductions in NSSI (i.e., the proportion of those reporting NSSI) at 6- or 12-month assessment points in either condition (Tyrer et al., 2003). Both studies examining MACT were characterized by substantial heterogeneity among treatments (e.g., both groups received individual problem-solving therapy), which may have contributed to the lack of group differences. Despite a lack of significant empirical support to MACT, the researchers note the feasibility and cost-effectiveness of MACT as a brief treatment (Evans et al., 1999; Tyrer et al., 2003), and further research is needed to more rigorously evaluate MACT and refine the elements of treatment (Kerr et al, 2010).
Common elements of effective treatments. A number of general therapy guidelines have been identified as important components of NSSI treatment, including: developing a positive therapeutic alliance, the use of functional analysis to understand the context surrounding episodes of NSSI, cognitive restructuring of maladaptive automatic thoughts, and behavioral interventions such as skill building and exposure techniques aimed at helping clients learn to withstand intense emotions and aversive experiences (Muehlenkamp, 2006).

Therapeutic alliance. Drawing from the literature on suicide, Muehlenkamp (2006) notes the importance of fostering a positive relationship in which the therapist and client work together as a team, rather than filling the roles of “expert” and “subject” (Jobes, 2000). The alliance has been defined as the emotional and collaborative bond between the therapist and patient (Martin, Garske, & Davis, 2000), and Bordin (1979) identified three components: goals (i.e., desired outcomes endorsed by both parties), tasks (i.e., specific actions toward the mutually agreed upon goals), and the bond (i.e., therapist-patient attachment that depends largely upon high levels of trust). As the most frequently cited common factor, meta-analytic reviews have reliably shown moderate correlations between the therapeutic alliance and psychotherapy outcome (Horvath & Symonds, 1991; Martin et al., 2000; Shirk & Karver, 2003). When working with individuals who engage in NSSI, a strong therapeutic alliance may have an even more powerful effect on treatment outcome because the relationship is likely to be challenged during the course of therapy and the relationship itself can be used as a therapeutic tool (Linehan, 1993a). Acknowledging and validating a client’s emotional pain, understanding specific functions that NSSI may serve (i.e., an effective, albeit self-destructive, coping strategy), and emphasizing and supporting autonomy can help foster a strong therapeutic alliance (Muehlenkamp, 2006; Miller & Rollnick, 2013). Once the foundation of a positive therapeutic relationship has been established, the next step in treatment is to target reducing and eventually eliminating NSSI.
Functional analysis. The goal of functional analysis is to identify the precipitating and maintaining events (e.g., cognitive, emotional, or environmental factors) associated with a recent episode (or representative example) of NSSI (Linehan, 1993a). Understanding the context of NSSI can highlight skill deficits, thereby helping to structure and inform treatment. For example, the occurrence of maladaptive automatic thoughts as precipitants of NSSI episodes would suggest incorporating cognitive restructuring into treatment. Similarly, if a client endorses unbearable anger as an antecedent to NSSI, building anger management skills may be quite helpful (Muehlenkamp, 2006). In addition to identifying treatment targets and informing intervention efforts, acknowledging the functional component of NSSI and validating a client’s reasons for engaging in NSSI can strengthen the therapeutic alliance.

Cognitive restructuring. Research has documented the presence of negative thoughts preceding NSSI (Klonsky, 2007; Nock et al., 2010), and individuals who engage in NSSI often present with a range of maladaptive thoughts about themselves, their body, their capacity to cope with distress, and their future (Favazza, 1996). Common cognitive distortions include believing that NSSI is an acceptable response to distress, self-punishment is deserved, action is required to reduce unpleasant feelings when under unbearable distress, and others can only fully understand the extent of suffering through overt action (Walsh & Rosen, 1988). Teaching clients how to challenge and modify these automatic thoughts by generating alternative appraisals should lead to the reduction or cessation of NSSI (Muehlenkamp, 2006). In conjunction with cognitive restructuring, functional analysis, and the development of a strong working alliance, behavioral interventions are another key component of NSSI treatment.

Behavioral interventions. Identifying the behavioral antecedents and consequences of NSSI (i.e., positive and negative reinforcers) through functional analysis can inform which specific behavioral interventions should be prescribed (Muehlenkamp, 2006). Skill deficits can
then be addressed, and therapists can help clients develop alternative coping strategies while building new skills (e.g., distress tolerance, problem-solving, communication, intimacy, assertiveness). In some cases, it can be beneficial to involve family members or significant others to help reduce potential external reinforcers. Additionally, bringing awareness to aversive immediate and long-term consequences associated with NSSI can aid in extinction (Muehlenkamp, 2006). Other behavioral interventions to consider include desensitization or exposure techniques that are used to increase a client’s ability to tolerate intense emotions and unpleasant experiences (Linehan, 1993a; Walsh & Rosen, 1988). DBT provides a structured approach to skill training in a number of areas that are likely to benefit individuals engaging in NSSI (Linehan, 1993b). DBT techniques and strategies may be particularly useful when the primary goal is the development of more adaptive skills.

**Summary and Conclusions**

While existing treatment outcome studies have prohibited researchers from drawing definitive conclusions regarding the efficacy of interventions targeted at reducing NSSI, cognitive-behavioral therapies (e.g., DBT, MACT) have provided the most promising results thus far (Muehlenkamp, 2006). Individuals who engage in NSSI are a highly heterogeneous group (Klonsky & Olino, 2008), which requires practitioners to adopt a creative and innovative approach to treatment with this population. Extant research suggests that effective treatments will likely be multi-modal, incorporating standardized interventions that have been shown to effectively treat aspects of NSSI (e.g., functional analysis, cognitive restructuring, distress tolerance skills), while maintaining flexibility and allowing for a personalized approach to meet the needs of each client (Muehlenkamp, 2006). Additionally, practitioners are wise to consider the fundamental importance of the therapeutic alliance (Linehan, 1993a) and remain attuned to a client’s level of motivation to change (Miller & Rollnick, 2013) throughout treatment for NSSI.
Validation, acceptance, and exploration of the functions of NSSI may also represent key components of effective treatment.

There are many challenges inherent in working with young people who engage in NSSI, as clients who self-harm may be likely to present with comorbid psychiatric conditions (e.g., eating disorders, substance abuse, anxiety), complex life histories (e.g., abuse/trauma, neglect, invalidation), difficulty forming trusting relationships, deficits in problem-solving, profound emotion dysregulation, and a tendency toward negative emotionality. Therefore, practitioners must possess critical attributes, including creativity, flexibility, and perseverance (Muehlenkamp, 2006). Clients who might have grown up in an invalidating or abusive environment may have difficulty building a trusting relationship with a therapist, and early interactions, such as assessments or intake evaluations, present opportunities to validate clients and respond to reports of NSSI in a nonjudgmental manner that communicates an understanding from the client’s perspective. While the methods of assessment (e.g., questionnaires, inventories, interviews), specific measures used (e.g., DSHI, SITBI, SASII), and aims of assessment may vary in clinical practice, practitioners ought to be mindful of the quality of the therapeutic relationship and seek to foster a positive working alliance.

Individuals engage in NSSI for a variety of reasons, and identifying the functions that NSSI serves is an important component of psychosocial treatment. As Nock and Prinstein (2004, 2005) have proposed, NSSI can serve interpersonal (social) and intrapersonal (automatic) functions and may be maintained through positive and negative reinforcement processes. Consistent with a functional model of NSSI (Klonsky, 2007, 2009; Nock & Prinstein, 2004, 2005), from a biopsychosocial perspective (Walsh, 2006), NSSI behavior results from a complex interaction between biological (e.g., genetic predisposition to emotion dysregulation, endogenous opioid dysfunction, diminished pain tolerance), environmental (e.g., invalidating family
environments, exposure to trauma, peer contagion effects), psychological (e.g., negative cognitive style, affect regulation function of NSSI), and behavioral factors (e.g., antecedents and consequences of NSSI). It is the task of the therapist to conduct a comprehensive assessment that not only explores the nature and history of NSSI (e.g., age of onset, methods used, severity, suicidality), but also gathers information about potential factors that precipitate and maintain NSSI behavior, which can be highly useful in informing and guiding intervention efforts.

While precise prevalence rates of NSSI have yet to be determined, and the extent to which certain demographic variables (e.g., gender, sexual orientation, culture, race/ethnicity) may contribute to differential outcomes regarding the onset and course of NSSI is unknown, there is wide consensus that NSSI is a legitimate international public health concern (e.g., Muehlenkamp et al., 2012a). Particularly startling is the high rate of NSSI among adolescents and young adults (e.g., Lloyd-Richardson et al., 2007; Plener, Libal, Keller, Fegert, & Muehlenkamp, 2009), and college students rank among the highest at risk for NSSI (e.g., Gollust et al., 2008; Kuentzel et al., 2012; Whitlock et al., 2006a). Practitioners who provide services to youth are in a unique position to intervene when NSSI is suspected, and ultimately have the power to reduce the number of casualties affected by this silent epidemic.
CHAPTER TWO

Prevalence and Correlates, Diagnostic Classification, Psychological Vulnerability Factors, and Functions of Non-Suicidal Self-Injury Among University Students: A Mixed-Method Analysis

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Prevalence and correlates, diagnostic classification, psychological vulnerability factors, and functions of non-suicidal self-injury among university students: A mixed-method analysis

Non-suicidal self-injury (NSSI) refers to the deliberate destruction of one’s own body tissue without lethal intent (Nock, 2009). NSSI is a global public health concern and prevalence estimates suggest that it is on the rise, yet much is unknown about the behavior. Only recently has the scientific community begun to view NSSI as a clinical syndrome discrete from other psychiatric conditions, and NSSI disorder is now listed as a “condition for further study” in the 5th edition of the *Diagnostic and Statistical Manual for Mental Disorders* (*DSM-5*; APA, 2013).

Youth appears to be a critical time for the onset of NSSI, and research suggests alarmingly high rates among adolescents and college students (e.g., Gollust, Eisenberg, & Golberstein, 2008). The transition into college can be a particularly stressful period (Lee, Dickson, Conley, & Grayson, 2014), and the first two aims of the present study were to add to the existing research by investigating the prevalence and correlates of NSSI among college students seeking counseling services at a large public university in the Northeast, and to examine a subgroup meeting criteria for NSSI disorder.

Individuals who engage in self-harming behaviors often present with significant distress and functional impairment. Unsurprisingly, NSSI has been associated with a range of psychiatric disorders (e.g., Brown, Comtois, & Linehan, 2002; Evren, Sar, Evren, & Dalbudak, 2008; Klonsky, Olteianns, & Turkheimer, 2003; Muehlenkamp, Claes, Smits, Peat, & Vandereycken, 2011). However, research on psychological variables explaining this comorbidity is lacking. Thus, our third aim was to explore anxiety sensitivity (AS) and distress tolerance (DT) as psychological variables that may serve as vulnerability factors underlying NSSI.

An emerging literature has documented that most self-injurers report feeling little or no pain during NSSI (Nock & Prinstein, 2004), and decreased pain sensitivity among those who
self-injure has been identified in behavioral studies (Kemperman et al., 1997; Russ, Campbell, Kakuma, Harrison, & Zanine, 1999). It has been posited that this pain insensitivity could result from habituation to physical pain, the release of endorphins during NSSI, or beliefs about deserving to be harmed (Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). It has also been proposed that individuals who engage in NSSI may use the physical pain to distract from emotional pain, thereby regulating emotion (Gratz et al., 2011).

The emotion regulatory function of NSSI has been well established (e.g., Chapman, Gratz, & Brown, 2006; Claes & Vandereycken, 2007), but less is known about other motivations for NSSI, including social or interpersonal functions. Additionally, few studies have explored sociocultural factors associated with NSSI, such as peer and family influences or the impact of the Internet and social media (Whitlock, Powers, & Eckenrode, 2006b). The fourth aim of the current investigation was to gain a deeper understanding of how multiple aspects of NSSI are integrated into a functional model, by interviewing individuals with a history of repeated NSSI.

In sum, the goals of the present two-part study were to: (1) investigate the prevalence and correlates of NSSI within a treatment-seeking university population, (2) identify the prevalence of diagnosable NSSI disorder, (3) examine the association between NSSI, AS, and DT, and (4) explore the lived experiences of students who self-injure.

**Characteristics and Prevalence of Non-Suicidal Self-Injury**

In the past decade, NSSI has received increased attention in the scientific community, the media, and popular culture. Cutting or carving oneself with a sharp implement is consistently the most common form of NSSI documented in the literature but most individuals report using multiple methods of NSSI (Nock & Prinstein, 2005). Females tend to cut or scratch themselves, and males are more likely to burn or hit themselves (Nock, 2009). Some studies suggest females may engage in NSSI more frequently (e.g., Laye-Gindhu & Schonert-Reichl, 2005). The first
episode of NSSI usually occurs between ages 12 and 15 (Muehlenkamp & Gutierrez, 2007; Nock, 2009), and hospital admissions records for nonfatal violence show that NSSI peaks at ages 15-24 and then declines (CDC, 2011). The frequency of NSSI tends to be higher in more vulnerable populations, with fewer episodes reported in community samples of adolescents and adults (e.g., under 10 lifetime episodes; Whitlock Muehlenkamp, & Eckenrode, 2008), and more frequent NSSI in inpatient psychiatric patients (e.g., 50+ episodes/year; Nock & Prinstein, 2004).

Empirical data from U.S. hospitals show a steep increase from 2001 to 2011 in hospitalizations for self-harm for all ages (from 300,848 to 468,939; CDC, 2011). Existing research suggests that young people are far more likely to engage in NSSI. Approximately 13-45% of adolescents and young adults report lifetime NSSI (e.g., Plener et al., 2009), compared to 4% of older adults (e.g., Briere & Gil, 1998). Furthermore, NSSI is especially pronounced in clinical populations, with 40-60% of adolescents and 19-25% of adults reporting lifetime NSSI (e.g., DiClemente et al., 1991; Briere & Gil, 1998). Cross-cultural research on NSSI is limited (particularly non-Western cultures), but extant research shows similar prevalence rates of NSSI in other countries. Recent systematic review of 52 empirical studies on self-harm yielded an international prevalence rate of 16-18% among adolescents (Muehlenkamp, Claes, Havertape, & Plener, 2012a). Clearly, effective prevention and intervention strategies for NSSI are needed.

**Non-Suicidal Self-Injury Disorder**

Until very recently, NSSI was not included in any standard diagnostic or classification systems, but NSSI disorder now appears in *DSM-5* as a condition requiring further study. NSSI disorder is characterized by repeated intentional self-inflicted bodily damage in the absence of suicidal intent. To meet criteria for current NSSI disorder, an individual must have engaged in self-harm on five or more days in the past year with the purpose of obtaining relief from a negative feeling or cognitive state, resolving an interpersonal difficulty, or inducing a positive
feeling state. The desired relief or response must be experienced during or shortly after engaging in NSSI. In addition, NSSI must be associated with interpersonal difficulties or negative feelings/thoughts, a period of preoccupation with NSSI that is difficult to control, or frequent thoughts of NSSI. Lastly, NSSI must cause clinically significant distress or interference, and cannot be socially sanctioned (e.g., religious/cultural ritual) or better explained by another mental disorder or medical condition (see Appendix A for DSM-5 criteria for NSSI disorder).

Although NSSI has long been regarded as a symptom of borderline personality disorder (BPD), emerging research provides support for classifying NSSI disorder as a discrete diagnostic entity. In a large community sample of adolescents in Sweden ($N = 3,060$), 6.7% of participants met the proposed criteria for NSSI disorder (Zetterqvist, Lundh, Dahlstrom, & Svedinm, 2013), although changes were subsequently made to the diagnostic criteria for NSSI disorder. While a handful of studies have evaluated the prevalence of diagnosable NSSI disorder (e.g., Glenn & Klonsky, 2013; Selby, Bender, Gordon, Nock, & Joiner, 2012; Zetterqvist et al., 2013), methodological limitations of these studies warrant further research in this area. The present study investigated the prevalence of NSSI disorder within a treatment-seeking university sample, using a measure specifically designed to correspond with the current DSM-5 criteria (Aim 2).

**Demographic Variables and Concurrent Psychiatric Conditions**

While the findings have been mixed, some studies have revealed gender differences in rates of NSSI, with females reporting higher rates of NSSI than males (e.g., Zlotnick, Mattia, & Zimmerman, 1999). Gender differences in NSSI are particularly pronounced in clinical samples (e.g., Zlotnick et al., 1999), which may be due to females being more likely to seek treatment (Heath, Schaub, Holly, & Nixon, 2009), or reflect differences in NSSI methods and frequency of NSSI episodes. The association between NSSI and other demographic characteristics is unclear. The few studies examining NSSI and sexual orientation have yielded mixed findings, with both
reports that homosexuality is associated with higher rates of NSSI (e.g., Skegg, Nada-Raja, Dickson, Paul, & Williams, 2003), and failures to replicate these results (e.g., Whitlock, Eckenrode, & Silverman, 2006a). While findings have also been mixed with regard to racial/ethnic differences, rates of NSSI tend to be higher in Caucasians (e.g., Gratz, 2006). Given the divergent findings regarding differences in NSSI based on gender, sexual orientation, and race/ethnicity, the current study examined these variables in a clinical sample (Aim 1).

NSSI has primarily been examined in patient populations, although more recent studies on community samples exist. Findings consistently point to significant associations between NSSI and other forms of psychopathology, including borderline personality traits (e.g., Klonsky et al., 2003), dissociation and dissociative disorders (e.g., Gratz, Conrad, & Roemer, 2002), disordered eating (e.g., Muehlenkamp et al., 2011), and substance abuse (e.g., Evren et al., 2008). Emotion dysregulation is a core feature of many of these conditions (e.g., Bradley et al., 2011; Cheetham, Allen, Yücel, & Lubman, 2010; Racine & Wildes, 2013), which may partly explain the high rates of comorbidity among individuals who engage in NSSI. A dysregulation model has also been proposed for emotional disorders (Hofmann, Sawyer, Fang, & Asnaani, 2013), and many studies have found correlations between NSSI and comorbid depression and anxiety (e.g., Gollust et al., 2008; Pinder, Iversen, Kapur, Wessely, & Fear, 2011). However, recent research suggests that anxiety may play a stronger role in NSSI than depression. In a sample of military recruits, the association between depression and NSSI was considerably smaller after controlling for the effects of anxiety, while a significant relationship between anxiety and NSSI remained after controlling for depression (Klonsky et al., 2003).

A strong association between trauma (e.g., childhood abuse) and NSSI has been repeatedly demonstrated in the literature (e.g., Glassman, Weierich, Hooley, & Nock, 2007; Weierich & Nock, 2008), although this relationship has been thought to result from common
psychiatric risk factors (Klonsky & Moyer, 2008). We assessed history of trauma and abuse in our sample to explore the complex relationship with NSSI (Aim 1), and we examined two dispositional factors that we believe could be associated with increased risk for NSSI.

**Anxiety Sensitivity and Distress Tolerance**

The present study investigated the psychological constructs of *anxiety sensitivity* (AS) and *distress tolerance* (DT) as potential vulnerability factors associated with NSSI (Aim 3). Distinct from trait anxiety, AS refers to the tendency to respond fearfully to anxiety-related sensations (Reiss, Peterson, Gursky, & McNally, 1986). Thus, AS is characterized by fear of anxiety symptoms themselves, as opposed to fearful responses to stressors in general. Since the concept of AS was introduced (Reiss & McNally, 1985), extensive research has been conducted, particularly on the etiology and maintenance of *anxiety disorders* (McNally, 2002). However, research has also supported the relevance of AS as a predictor of *mood disorders* (e.g., Cox, Enns, Freeman, & Walker, 2001), *substance abuse* (e.g., Schmidt, Buckner, & Keogh, 2007), and *smoking* (e.g., Zvolensky, Bonn-Miller, Bernstein, & Marshall, 2006). The relationship between AS and NSSI is worthy of investigation given that anxiety symptomatology more generally has been associated with NSSI (e.g., Hoff & Muehlenkamp, 2009).

Studies have found associations between anxiety and NSSI among university students (e.g., Kerr & Muehlenkamp, 2010), community samples of adolescents (e.g, Young, Van Beinum, Sweeting, & West, 2007), and military personnel (e.g., Pinder, Iversen, Kapur, Wessely, & Fear, 2011). However, to our knowledge only one study has explored the relationship between AS and NSSI among adolescents, and there were no significant differences between those who self-injured and healthy controls in terms of AS (McCoy, Fremouw, & McNeil, 2010). The authors speculate that the null findings may have been due to small sample size (11 self-injurers; 33 controls), and further research with a larger sample is needed.
DT is the capacity to experience and withstand negative psychological states (Simons & Gaher, 2005), and persist in goal-directed behavior when distressed (Daughters, Sargeant, Bornovalova, Gratz, & Lejuez, 2008). Considered a meta-emotion, DT involves subjective perception and evaluation of negative stimuli as it relates to four components: appraisal/acceptability, tolerability/aversiveness, emotion regulation, and absorption of attention (Simons & Gaher, 2005). Individuals with low DT tend to describe emotional discomfort as unbearable and unacceptable and make significant efforts to avoid unpleasant stimuli. If unable to regulate negative emotions, individuals with low DT report being consumed and absorbed by the experience. DT has been found to be negatively associated with affect dysregulation and positively associated with positive affect (Simons & Gaher, 2005). The ability to tolerate distress may influence the strategies used for affect management (Simons & Gaher, 2005). It has been posited that individuals may harm themselves or others as a method of coping or regulating emotion in times of increased distress (Daughters et al., 2008).

Low DT has been associated with a range of maladaptive behaviors thought to reduce negative affect, including substance use (e.g., Bornovalova, Lejuez, Daughters, Rosenthal, & Lynch, 2005) and disordered eating (e.g., Corstorphine, Mountofrd, Tomlinson, Waller, & Meyer, 2007). Not surprisingly, low DT has also been associated with NSSI (e.g., Gratz et al., 2011; Klonsky, 2009; Nock & Mendes, 2008). DT seems to play a role in NSSI, but further research could support the utility of brief screening measures to identify patients at elevated risk for using NSSI to manage distress and also inform interventions aimed at increasing DT.

AS and DT are generally seen as related, yet distinct constructs (Zvolensky, Leyro, Bernstein, & Vujanovic, 2011). AS reflects sensitivity to aversive emotional states, while DT reflects tolerance of aversive emotional states (Bernstein, Zvolensky, Vujanovic, & Moos, 2009). Increasing attention has been paid to the role of emotional sensitivity and affective intolerance in
the development and maintenance of psychological disorders. Thus, low DT may amplify a normal anxiety reaction, thus contributing to the pathogenesis of anxiety disorders (Schmidt, Mitchell, Keough, & Riccardi, 2011). AS has been conceptualized as a form of DT, pertaining solely to fear of anxiety sensations (Schmidt et al., 2011). Existing research supports an inverse relationship between AS and DT (Anestis, Selby, Fink, & Joiner, 2007; Bernstein et al., 2009; Keogh, Riccardi, Timpano, Mitchell, & Schmidt, 2010). While studies have explored the association between AS, DT, and psychopathology (e.g., anxiety disorders), to our knowledge, no studies have investigated relationship between AS, DT, and NSSI in a clinical sample.

**Functional Model of Non-Suicidal Self-Injury**

A functional approach to understanding psychological phenomena posits that behaviors are caused by events that immediately precede and follow the behavior in question. Nock and Prinstein (2004) proposed a four-factor model of the development and maintenance of NSSI. Confirmatory factor analysis has supported the four-factor structure of the model in adolescent (Nock & Prinstein, 2005) and adult populations (Brown et al., 2002). Nock and Prinstein’s (2004) functional model emphasizes the immediate antecedents that trigger NSSI and the consequences that maintain the behavior. In this model, NSSI can serve *intrapersonal* (e.g., affect regulation) and *interpersonal* (e.g., help-seeking) functions, with both positive and negative reinforcement processes maintaining the behavior (Nock, 2009). With *intrapersonal positive reinforcement*, NSSI precipitates desired thoughts or feelings (e.g., satisfaction), while with *intrapersonal negative reinforcement*, aversive thoughts or feelings are reduced after NSSI (e.g., relief from distress). NSSI can also be maintained through *interpersonal positive reinforcement*, in which the behavior precedes a desired social event (e.g., attention), or *interpersonal negative reinforcement*, in which NSSI is followed by a decrease of some social event (e.g., parents cease arguing). Through qualitative interviews, the present study explored
functions of NSSI, sociocultural factors influencing NSSI behavior (e.g., peers, media, Internet), and perceived ability to effectively manage emotions and tolerate distress (Aim 4).

Goals of the Current Research

The present two-part mixed-method investigation had four over-arching aims that approach NSSI from multiple perspectives. **Study 1** used quantitative methods to examine the prevalence and correlates of NSSI (Aim 1), identify the prevalence of NSSI disorder (Aim 2), and investigate AS and DT as potential psychological vulnerability factors for NSSI (Aim 3). Specifically, Study 1 was designed to answer the following questions: *What is the prevalence of NSSI among a clinical sample of university students and what demographic variables are associated with NSSI? How many of the individuals endorsing history of self-harm meet criteria for NSSI disorder? Do individuals who self-injure tend to score differently on measures of AS and DT, relative to those who report no history of NSSI? Additionally, does severity of NSSI (i.e., lifetime episodes of self-harm) correlate with measures of AS and DT?*

**Study 2** applied qualitative methodology to explore the experiences of those who self-injure through individual interviews, with particular emphasis on predisposing factors, precipitating factors implicated in the development and course of NSSI, and maintenance factors (Aim 4). Study 2 aimed to answer the following questions: *What can be learned about NSSI by listening to those who have self-injured? When and how was NSSI first discovered? What are some of the sociocultural factors that have influenced NSSI behavior (e.g., the role of the media, online forums and websites devoted to self-harm)? How do individuals feel about NSSI and what are their motivations for engaging in NSSI? How do individuals feel about their ability to tolerate distress and manage emotions and do they perceive this as playing a role in their NSSI?*
RESEARCH DESIGN AND METHODS

All participants were full-time adult students enrolled at a large public university in the Northeast who presented to the Counseling Center for psychological services. Participants completed self-report questionnaires (Study 1), and selected individuals meeting eligibility criteria for further protocols were invited to participate in the qualitative interview (Study 2).

Aims for Study 1

AIM 1: To identify the prevalence and correlates of NSSI behavior among treatment-seeking university students. The first aim was to examine the prevalence of NSSI and explore methods/techniques of NSSI, severity of NSSI, and frequency of NSSI episodes. Additional variables of interest included: demographics such as gender, sexual orientation, race/ethnicity, and religion/spirituality; degree of perceived social support; and history of abuse/trauma. Given the lack evidence for demographic differences in NSSI, we expected that the rates of NSSI in our sample would be similar across gender, sexual orientation, race/ethnicity, or religious affiliation. With regard to sociocultural factors, we hypothesized that individuals with a history of NSSI would have spent time on the Internet searching for NSSI-related content, and personally know someone who has engaged in NSSI. In line with previous research, we hypothesized that individuals with a history of NSSI would be more likely to report abuse or assault. Finally, we predicted that lifetime NSSI would be associated with lower levels of perceived social support.

AIM 2: To identify the prevalence of diagnosable NSSI disorder. The second aim was to evaluate the prevalence of NSSI disorder based on DSM-5 criteria. Given that a diagnosis of NSSI disorder requires repeated self-harm in the past year with specific precipitants and functions, and must be associated with distress and/or interferences, we hypothesized that the prevalence of NSSI disorder would likely be lower than the overall rate of NSSI behavior in our sample. Furthermore, we expected NSSI disorder to be associated with greater impairment.
**AIM 3: To explore AS and DT as potential psychological vulnerability factors for NSSI.**

Based on findings linking general anxiety and anxiety disorders to NSSI, we expected that AS would also be associated with NSSI. Similarly, we anticipated that DT would be associated with NSSI in our sample. Specifically, we hypothesized that individuals with lifetime NSSI would exhibit higher AS and lower DT, relative to controls. Furthermore, we predicted that the magnitude of effect would be greatest with NSSI disorder entered as the dependent variable.

**Procedures for Study 1**

The Institutional Review Board (IRB) for both universities approved all procedures prior to data collection. IRB-approved study advertisements were displayed in the Counseling Center and due to low recruitment rates, one of the researchers (DH) began approaching clients in the waiting room. Students were invited to participate in a research study about responses to distress that involved completing brief questionnaires. Compensation was offered in the form of a monthly drawing for a $20 gift card. Most students approached agreed to participate in the study, with the exception of a handful who politely declined ($n = 5$). Interested clients were deemed eligible if the following inclusion criteria were met: (a) prior consent to be treated at the Counseling Center and (b) English language fluency. Potential participants were screened for eligibility (none were found to be ineligible) and provided written consent before completing study measures. In addition, they were given the option to provide their contact information for future research. Data collection took place between October 14, 2014 and May 8, 2015. Participants completed paper and pencil self-report questionnaires while they were waiting to be seen for a counseling appointment. A limited number of participants requested to finish the questionnaires at home, and while most packets were returned, seven participants were lost to follow-up. Based on responses to Study 1, eligible participants were invited to participate in an individual interview (see Study 2 below).
Measures for Study 1

**Demographic Questionnaire.** Participants provided their age, gender, race/ethnicity, and participation in religion/spirituality (See Appendix B). Sexual orientation was obtained from electronic records as was history of abuse/trauma. Additionally, participants rated the degree to which they receive adequate emotional help and support from family and their wider social network on a 5-point Likert-type scale (1 = disagree completely to 5 = agree completely).

**Anxiety Sensitivity Index (ASI).** The ASI is a self-report measure that assesses the tendency to respond fearfully to anxiety-related sensations (Reiss, Peterson, Gursky, & McNally, 1986). Respondents rate 16 items on a 5-point Likert-type scale (0 = very little to 4 = very much). The overall score is calculated by summing all of the items, with higher scores indicating greater AS. The ASI is comprised of three subscales, each computed by summing items as follows: AS-Physical Concerns (items 3, 4, 6, 8-11), AS-Cognitive Concerns/Mental Incapacitation (items 2, 12, 15, 16), and AS-Social (items 1, 5, 13). Normative data from non-clinical and clinical (panic disorder) samples found the mean total ASI scores to be 19.1 (SD = 9.11) and 36.4 (SD = 10.3), respectively (Antony, 2001). In our sample, the internal consistency of the ASI was excellent for the overall score (α = .91) and good for two of the subscales, AS-Physical Concerns (α = .86) and AS-Cognitive Concerns (α = .85), but was poor for AS-Social Concerns (α = .39).

**Distress Tolerance Scale (DTS).** The DTS is a 15-item self-report measure of an individual’s perceived ability to tolerate distress (Simons & Gaher, 2005). Items are rated on a 5-point Likert-type scale (1 = strongly agree to 5 = strongly disagree). Items load onto a general factor of psychological DT and four subscales: tolerance (ability to tolerate emotional distress; α = .72), appraisal (subjective cognitive appraisal of distress; α = .82), absorption (whether attention is absorbed by negative emotions; α = .78), and regulation (regulation efforts or avoidance of affect; α = .70; Simons & Gaher, 2005). Each subscale is averaged and the higher-
order DT factor is derived from the overall mean. Higher scores represent greater tolerance for emotional distress. Among large college samples, greater DT has been positively associated with mood acceptance \( (r = 0.47) \) and mood regulation \( (r = 0.54) \), and negatively correlated with emotional lability \( (r = -0.51) \) and negative affect \( (r = -0.59; \) Simons & Gaher, 2005), indicating good convergent, discriminant, and criterion validity. The DTS has demonstrated good test-retest reliability \( (r = 0.61) \) among university students (Simons & Gaher, 2005). In our sample, the internal consistency was excellent for the overall score \( (\alpha = .92) \) and good for each subscale: Appraisal \( (\alpha = .83) \) and Absorption \( (\alpha = .81) \), Tolerance \( (\alpha = .79) \), and Regulation \( (\alpha = .78) \).

**Non-Suicidal Self-Injury Disorder Inventory (NSSI-DI).** The NSSI-DI (see Appendix C) is a 19-item self-report measure created for the current study that assesses for symptoms that constitute NSSI disorder according to DSM-5 diagnostic criteria (see Appendix A). The NSSI-DI assesses for methods of self-harm, prevalence of NSSI (lifetime, past year, past month, past week, and last time), and inquires about reasons for NSSI, the presence of negative feelings or thoughts prior to engaging in NSSI, social or occupational interference in functioning, and treatment for self-harm. Participants also responded to four open-ended questions about their experiences with NSSI on the Internet, perceptions of self-harm websites, and attitudes toward individuals who engage in self-harm (including themselves, if applicable).

**Data Analysis Procedures for Study 1**

All statistical analyses were performed using *Version 20.0 of IBM SPSS Statistics for Macintosh*. Statistical assumptions were tested prior to conducting any parametric tests to ensure for adequate sample size, normality, absence of multicollinearity, and homogeneity of variance. For the demographic data, descriptives were calculated for the overall sample (frequencies, means, standard deviations). The prevalence of NSSI was determined based on frequency estimates and descriptive statistics were generated for additional study variables pertaining to
NSSI behavior (e.g., age of onset of NSSI, methods/techniques, frequency of NSSI). History of
NSSI was computed as a dichotomous variable, denoting whether lifetime NSSI was endorsed
(“NSSI” group) compared to those reporting no history of NSSI (“No NSSI” group). Descriptive
statistics were performed to determine the prevalence of NSSI disorder within the clinical
university sample. Presence of diagnosable NSSI disorder was calculated based on participant
responses to the NSSI-DI. As with history of NSSI, NSSI disorder was computed as a
dichotomous variable (“NSSI Disorder” group vs. “No NSSI Disorder” group). Chi squared tests
were performed to explore potential differences in demographic variables by group (NSSI vs. No
NSSI), and by gender within the NSSI group. We also explored gender differences with respect
to NSSI behavior and individual items on the NSSI-DI. Chi squared analyses were also used to
assess for differences between groups based on sociocultural factors (e.g., Internet, peers) and
history of trauma. To explore differences between the NSSI and No NSSI group with regard to
perceived social support from family and friends, we conducted two independent-samples t-tests.

Two independent-samples t-tests were performed to investigate whether individuals who
self-injure tend to have higher AS and lower DT, relative to controls. Additional independent-
samples t-tests assessed for differences between the NSSI and No NSSI groups on the ASI and
DTS subscales. Severity of NSSI was computed based on the number of lifetime episodes
(“minor” = 1-5 times, “moderate” = 6-20 times, “severe” = 21-50 times, “extreme” = 50+ times).
Correlation analysis explored independent associations among the ASI and DTS subscales and
severity of NSSI. We followed-up with linear regression to test the relative magnitude of the
strength of the predictors in a model with severity of NSSI as the dependent variable and each of
the DTS and ASI subscales as independent variables. We used linear regression to determine
which subscales would be independently associated with severity of NSSI, when factoring in
scores from the other subscales. We conducted independent-samples t-tests to assess for
differences in ASI and DTS subscales among those with and without NSSI disorder.

Written narratives from the free-response questions on the NSSI-DI were aggregated and the text was turned into word clouds using the online software program Wordle (Feinberg, 2009). A word cloud is a special representation of text that highlights more frequently used words by giving them more prominence in the visualization. Word clouds are visually appealing, easy to interpret, and are becoming increasingly popular among researchers as a way of presenting qualitative data in a rich format (e.g., McNaught & Lam, 2010; Schwartz et al., 2013). See Figures 1-4 for word clouds displaying prominent themes.

Aim for Study 2

AIM 4: To explore the lived experiences of individuals who have engaged in NSSI. Areas of interest included general NSSI behavior, perceived ability to cope with distress, beliefs and attitudes about NSSI, and impressions of how NSSI is portrayed in the media and popular culture. Given that this was an exploratory investigation, specific hypotheses were not posited.

Procedures for Study 2

Individuals who endorsed repeated NSSI in Study 1 (more than five times in the past year) were contacted via email about their interest in participating in a qualitative interview. Exclusion criteria for Study 2 included: (a) the presence of active psychosis or (b) a suicide attempt in the past year. Of the 89 participants who provided written permission to be contacted for future research, 18 individuals were invited to participate in Study 2. Eight individuals were scheduled for an interview, but one individual did not present for the interview and was not included in the qualitative study. Written consent was obtained prior to starting the interview that took place in a private office within the Counseling Center. In line with recommendations put forth by Nock (2009) and others, less sensitive topics were introduced first, before questions regarding NSSI. Interviews were audio recorded and transcribed for subsequent analysis.
Interview length ranged from 33-89 minutes ($M = 53.71; SD = 19.69$). At least 5 minutes of debriefing was allotted at the end of each interview, and relaxation techniques were offered to participants (e.g., diaphragmatic breathing, mindfulness exercises, grounding techniques). Upon completion of the interview, participants were given a $10$ gift card and “distress tolerance kit” consisting of a handout on managing stress and various items that could be used for relaxation, cultivating mindfulness, and self-soothing (e.g., play dough, stress ball, bracelets, teas).

**Measures for Study 2**

**Self-Injurious Thoughts and Behaviors Inventory – Short Form (SITBI).** The *SITBI* is a 72-item structured interview that assesses the presence, frequency, and characteristics of a range of self-injurious thoughts and behaviors (Nock, Holmberg, Photos, & Michel, 2007). To minimize participant burden, only the questions pertaining to NSSI behaviors were used (items 62-72). The *SITBI* has shown good construct validity ($\kappa$s = .48-1.0) test-retest reliability (all $\kappa$s $\leq .71$, except suicide gesture $\kappa = .25$), and interrater reliability ($\kappa$s = .90-1.0; Nock et al., 2007).

**Open Ended Questions.** Participants were asked a series of open-ended questions about general coping and NSSI behavior (see Appendix D). Interview topics included: onset of NSSI, sociocultural factors (e.g., peers, Internet, media), degree of disclosure about NSSI to others, functions and triggers of NSSI, perceived ability to regulate emotions and manage anxiety, and precipitants and antecedents of NSSI episodes (e.g., typical scenario, thoughts before and after).

**Data Analysis Procedures for Study 2**

A subset of participants from Study 1 ($N = 128$), completed the qualitative interview ($n = 7$), thus demographic information and other data collected in Study 1 were available for each interviewee. We calculated descriptive statistics (frequencies, means, and standard deviations) for study variables (e.g., perceived social support, scores on the *ASI* and *DTS*) as well as for data from the *SITBI* on NSSI behavior. Audio recordings were transcribed verbatim and transcripts
were checked twice for accuracy. Then, we conducted thematic analysis (Braun & Clarke, 2006), an inductive approach in which the identification of themes was data driven.

Thematic analysis consists of consisting of six sequential phases. First, we became familiar with the data through repeated reading. Next, we generated an initial list of ideas about what is observed in the data. Third, interviews were initially coded and collated, and we searched for themes across the data. Next, we refined candidate themes based on how the different themes fit together. During this phase, some candidate themes were discarded and categories were collapsed or broken down as needed. Once a thematic map was created, themes were defined and further refined. Finally, a detailed coding book with definitions for each theme was produced, comprised of 172 data-derived subthemes, sorted into 13 groups of major themes, and further organized into five theory-driven broad categories: (1) predisposing factors, (2) precipitating factors, (3) general NSSI behaviors, (4) consequences and concealment issues, and (5) comorbidity and treatment. After coding and checking each interview twice, we determined the frequency of each thematic category and counts for individual subthemes. Responses could be coded as belonging to more than one subtheme, and each participant could provide multiple responses. In addition to this formal analysis, we compiled interview narratives and created a series of Wordles (Feinberg, 2009) that visually display prominent themes (See Figures 5-13).
RESULTS: STUDY 1

The sample consisted of 128 students (66 female, 60 male, 2 transgender; $M$ age = 21.7 years, $SD = 3.8$, range = 18-44 years). The majority of participants identified as White (71.9%, $n = 92$), most were heterosexual (77.3%, $n = 99$), and about half indicated not having strong religious beliefs (50.8%, $n = 65$). Additional demographic data are presented in Table 1.

Prevalence of Non-Suicidal Self-Injury

Forty-eight participants (37.5%) endorsed history of self-harm without suicidal intent ($M$ age = 21.4, $SD = 3.3$, range = 18-36), of whom 62.5% ($n = 30$) had engaged in NSSI within the past year, 37.5% in the past month ($n = 18$), and 16.7% ($n = 8$) in the past week (see Table 2 for frequency of NSSI by timespan, severity, and last episode of NSSI). All participants reported using multiple methods of NSSI, and the most common techniques included: hitting (68.8%, $n = 33$), scratching/scraping skin (66.7%, $n = 32$), cutting/carving skin (56.3%, $n = 27$), excoriation (33.3%, $n = 16$), burning skin (27.1%, $n = 13$), inserting objects under skin/nails (14.6%, $n = 7$), and rubbing/”erasing” skin (12.5%, $n = 6$). The age of onset of NSSI ranged from 6 to 23 ($M = 14.7$, $SD = 3.7$). Less than one third reported ever receiving treatment for NSSI (31.3%, $n = 15$).

Individual Differences Based on NSSI and Gender Differences in NSSI Behavior

We detected no significant differences between the NSSI and No NSSI groups based on gender ($X^2(2) = 1.69$, $p = .430$), even when the two transgender students were omitted from the analysis ($X^2(1) = 1.56$, $p = .212$), or race/ethnicity ($X^2(6) = 8.96$, $p = .176$), even when comparing Whites versus non-Whites ($X^2(1) = .009$, $p = .925$). We also found no significant differences with respect to sexual orientation ($X^2(4) = 6.61$, $p = .158$), even when dichotomizing heterosexual versus non-heterosexual ($X^2(1) = 2.15$, $p = .143$), or religion ($X^2(12) = 11.21$, $p = .511$), even when dichotomizing religious versus non-religious ($X^2(1) = 0.17$, $p = .677$).
Chi-squared analysis revealed significant differences in the type of NSSI methods used based on gender (females: \( n = 28 \); males: \( n = 19 \)). Females were more likely to have engaged in scratching/scraping (79.0%, \( n = 22 \); \( \chi^2(1) = 4.91, p = .027 \)) and excoriation (43.0%, \( n = 12 \); \( \chi^2(1) = 3.82, p = .051 \)), relative to males (47.4%, \( n = 9 \); 15.8%, \( n = 3 \)). All other NSSI methods were equally as likely regardless of gender. As can be seen in Tables 2 and 3, there were no gender differences observed with respect to the total number of lifetime episodes of NSSI (\( \chi^2(7) = 7.21, p = .407 \)), frequency of NSSI (past year: \( \chi^2(6) = 4.56, p = .602 \); past month: \( \chi^2(5) = 0.34, p = .389 \); past week: \( \chi^2(1) = 0.34, p = .853 \)), time since last episode (\( \chi^2(8) = 6.72, p = .567 \)). Females and males were equally as likely to have been treated for NSSI (\( \chi^2(1) = 1.73, p = .188 \)).

While there were no gender differences in perceived distress caused by NSSI (\( \chi^2(1) = 0.95, p = .329 \)), females were significantly more likely to report interference in social or occupational functioning (57.1%, \( n = 16 \); \( \chi^2(1) = 10.43, p = .001 \)), relative to males (10.5%, \( n = 2 \)). We found no other gender differences in endorsement of individual criteria for NSSI disorder, including the reasons for engaging in NSSI (relief from negative feelings: \( \chi^2(1) = .215, p = .643 \); interpersonal problems: \( \chi^2(1) = 1.94, p = .163 \); feel better: \( \chi^2(1) = 1.05, p = .307 \)), negative feelings/thoughts prior to NSSI (\( \chi^2(1) = .060, p = .807 \)), preoccupation with thoughts of self-harm (\( \chi^2(1) = .016, p = .900 \)), or frequent urges to engage in NSSI (\( \chi^2(1) = .146, p = .227 \)).

**Sociocultural Factors, History of Trauma, and Perceived Social Support**

Compared to individuals without a history of self-harm (\( n = 79 \)), those endorsing one or more episodes of NSSI (\( n = 46 \)) were significantly more likely to have searched online for NSSI-related content (43.5%, \( n = 20 \) vs. 13.9%, \( n = 11 \); \( \chi^2(1) = 13.62, p \leq .001 \)) or visited websites with self-harm as the primary subject NSSI (30.4%, \( n = 14 \) vs. 5.1%, \( n = 4 \); \( \chi^2(1) = 15.18, p \leq .001 \)). Additionally, we found a significant difference between the NSSI group (\( n = 47 \)) and No NSSI group (\( n = 79 \)) based on whether participants personally knew someone who has ever...
engaged in NSSI (91.5%, \( n = 43 \) vs. 62.1%, \( n = 49 \); \( X^2(1) = 12.98, p \leq .001 \)).

The results of the chi-squared analyses revealed a significant association between NSSI (females: \( n = 26 \); males: \( n = 18 \); transgender: \( n = 1 \)) and history of abuse/assault (53.3%, \( n = 24 \); \( X^2(1) = 7.121, p = .008 \)) relative to No NSSI (28.8%, \( n = 21 \)). A trend in the data showed that females with a history of NSSI were more likely to also have a history of abuse/assault (65.4%, \( n = 17 \); \( X^2(1) = 3.01, p = .083 \)), relative to males (38.9%, \( n = 7 \)). The results from \( t \)-tests examining perceived social support showed that there were no significant group differences based on history of NSSI, with most participants indicated “neutral” or “somewhat agree” with regard to receiving adequate emotional support from family (\( t(116) = -1.81, p = .072 \)) and friends (\( t(115) = .946, p = .346 \)). However, a trend in the data (\( p = .072 \)) suggests that individuals with a history of NSSI may feel less supported by family (\( M = 3.11, SD = 1.28 \) vs. \( M = 3.57, SD = 1.34 \)).

**Prevalence of NSSI Disorder**

Of those reporting lifetime NSSI (\( n = 48 \)), one quarter (\( n = 12 \); females: \( n = 8 \); males: \( n = 4 \)) met full criteria for NSSI disorder according to \( DSM-5 \) (9.4% of the entire sample), with four additional cases that could be classified as “subclinical” due to meeting most of the criteria except for endorsement of distress and/or interference (Criterion E). Without further assessment we cannot determine whether these four individuals would have met full \( DSM-5 \) criteria for NSSI disorder. Therefore, these “subclinical” cases were not assigned to the NSSI disorder group for our analyses. However, had these cases been included in the NSSI disorder group, the overall prevalence of NSSI disorder in our full sample of 128 participants would have increased to 12.5% (\( n = 16 \)), which equates to one third of the NSSI group.

**Anxiety Sensitivity, Distress Tolerance, and NSSI**

The results of the independent-samples \( t \)-tests indicated that individuals reporting lifetime NSSI showed significantly lower DT (\( t(126) = 2.924, p = .004 \)), as measured by scores on the
DTS (M = 35.71, SD = 12.03), relative to those with no history of self-harm (M = 42.21, SD = 12.28). While the findings were not statistically significant for AS (t(126) = 1.40, p = .165), ASI scores were higher for individuals with lifetime NSSI (M = 28.96, SD = 12.55), compared to controls (M = 25.71, SD = 12.85). The results from t-tests examining the DTS and ASI subscales mirrored results from the t-tests of the overall scores for each measure. The t-tests for three of the four DTS subscales revealed statistically significant group differences based on NSSI history, with the DTS Appraisal subscale being the most significant (p = .003), followed by DTS Regulation (p = .021), and DTS Absorption (p = .044). Results indicated a trend toward significance for the DTS Tolerance subscale (p = .059). Consistent with findings for overall ASI score, there were no significant differences between NSSI groups for any of the ASI subscales. See Table 4 for detailed results from the t-tests for both measures.

Results from the correlational analysis revealed a moderate to large negative association between DTS and ASI total scores (r = -.48, p < .01). The DTS total score was also moderately negatively correlated with the severity of NSSI, a variable computed based on number of lifetime episodes of NSSI (r = -.30, p ≤ .01). All of the DTS subscales demonstrated significant small to moderate negative correlations with severity of NSSI (Tolerance: r = -.18, p ≤ .05; Absorption: r = -.25, p ≤ .01; Appraisal: r = -.32, p < .01; Regulation: r = -.22, p ≤ .05). None of the ASI subscales were significantly correlated with severity of NSSI. However, the ASI subscales were intercorrelated with each other, and with all but one of the DTS subscales (DTS Regulation was not associated with ASI Physical Concerns). The DTS subscales were similarly intercorrelated with one another (see Table 5 for the correlation matrix for the ASI and DTS subscales).

We conducted exploratory regression analyses to test the relative strength of each independent variable and determine which DTS and/or ASI subscales would best predict NSSI severity. Linear regression revealed that the only significant predictor of NSSI was the DTS
Appraisal subscale score ($B = -.43, t(126) = 6.07$), and this accounted for about 10% of the variance in NSSI severity ($R^2 = .104, F(1, 126) = 14.66, p \leq .001$). While the overall model with all seven subscales remained significant ($F = 2.321, p = .03$), no other subscales contributed to a significant proportion of variance in NSSI severity beyond the DTS Appraisal subscale.

We conducted independent samples $t$-tests to examine group differences on the ASI and DTS subscales based on the presence of diagnosable NSSI disorder (a dichotomous variable computed from responses from the NSSI-DI). Results revealed significant differences among three subscales, with history of NSSI associated with lower scores on DTS Appraisal ($M = 2.31, SD = 0.85$ vs. $M = 2.86, SD = 0.92; t(125) = 2.30, p = .023$) and DTS Absorption ($M = 1.85, SD = 0.65$ vs. $M = 2.38, SD = 1.03; t(125) = -2.36, p = .020$), and higher scores on ASI Cognitive Concerns ($M = 9.67, SD = 3.80$ vs. $M = 6.57, SD = 4.50; t(125) = -3.70, p \leq .001$).
RESULTS: STUDY 2

The interview sample was comprised of seven students (5 female, 2 male) ranging in age from 18 to 32 years old ($M = 22.3$ years, $SD = 4.7$). Four participants identified as White and three were Hispanic/Latina ($n = 1$ international student). Three participants identified as heterosexual, two preferred not to ascribe a label to their sexual orientation, one identified as bisexual, and one indicated being unsure about their sexuality. Four participants reported not having strong religious beliefs, while the other three were Catholic. On average, participants “somewhat agreed” that they received adequate social support from friends ($M = 3.9$, $SD = 0.7$), and felt “neutral” about family support ($M = 3.0$, $SD = 1.2$). The average score on the DTS was $35.43$ ($SD = 11.34$), which was similar to the larger sample of participants ($n = 128$; $M = 35.71$, $SD = 12.03$). While the small sample ($n = 7$) precluded statistical analysis, it is interesting to note that the average score on the ASI among interviewees was nearly ten points higher than what was observed in the overall sample ($M = 37.57$, $SD = 12.18$ vs. $M = 28.96$, $SD = 12.55$).

Prevalence and Frequency of NSSI Behaviors

The age of onset of NSSI ranged from 8 to 19 years old ($M = 13.0$, $SD = 3.3$). Two participants had engaged in NSSI 100+ times (50-100 times $n = 3$, 21-50 times $n = 2$). Six participants had engaged in NSSI within the past year (past month $n = 5$, past week $n = 3$). The amount of time since the last NSSI episode ranged from one week ($n = 3$) to two years ago ($n = 1$). The length of time from urge to engaging in NSSI ranged from $\geq 60$ seconds ($n = 2$) to two days ($n = 3$), with two participants endorsing multiple time frames depending on NSSI method. Of the seven interview participants, five met full criteria for NSSI disorder, representing 41.7% of the individuals with NSSI disorder in the overall sample ($n = 12$). When asked to rate the likelihood of future NSSI episodes on a 5-point Likert-type scale ($0 =$ low to $4 =$ very much), the average rating was 2.4 ($SD = 1.1$), and no participants predicted complete abstinence from NSSI.
Thematic Analysis of Interview Narratives

We identified 172 individual subthemes through the process of thematic analysis. The total number of subthemes coded per interview ranged from 84 to 178 ($M = 109.7$, $SD = 32.9$) and the number of unique subthemes coded per interview ranged from 48 to 77 ($M = 61.6$, $SD = 9.0$). Drawing from the available literature on NSSI, the inductively-generated subthemes were organized into 13 major thematic categories, which were further classified into five broad domains: (a) predisposing factors, (b) precipitating factors, (c) general NSSI behavior, (d) consequences and concealment issues, and (e) comorbidity and treatment (see Table 6 for total counts of major themes and broad domains coded for each interview participant). Below we present the most common subthemes and highlight some interesting findings discovered through thematic analysis (See Table 7 for the number of unique participants endorsing each subtheme and major theme and the total number of narratives coded as belonging to each subtheme).

Predisposing factors. Predisposing factors are variables considered to be vulnerability factors for NSSI. Subthemes coded within this domain ($n = 322$ narratives) were classified into six major thematic categories: environmental factors, sociocultural influences on NSSI, emotion regulation skills, general coping strategies, perceptions of self, and attitudes about NSSI.

Environmental factors. While we did not directly assess for familial or individual risk factors, six participants spontaneously reported historical experiences known to be deleterious to healthy psychological development. Four participants reported family conflict or struggles growing up, family history of mental health and/or substance use issues, or parental divorce. Five individuals noted past experiences of significant loss, bullying, sexual trauma, and/or invalidation from a caregiver, and four participants endorsed current major stressors.

Sociocultural influences on NSSI. Participants reported exposure to NSSI among peers ($n = 7$) and family members ($n = 4$), including the direct observation of parental NSSI: “My
mom comes from a dark place as well. I probably got it from either her or other family at a young age. She would like bang on the counter or something and occasionally like bang herself on the head” (Participant #3, male, age 24). A number of individuals reported exchanging methods of NSSI with peers or within online communities, and two participants discussed the influence of “Emo” subculture, reflected in the following narrative, “Well, like in middle school, more in 8th grade—I don’t know if you’ve heard of the trend Emo—I found that scene and fit into it and that’s how I learned about [self-harm] and tried it” (Participant #1, female, age 20). All but one participant had viewed NSSI-related online content, and four individuals reported visiting websites devoted to other problematic behaviors (e.g., eating disorders, suicide).

Emotion regulation skills. All seven participants endorsed having difficulties regulating their emotions (e.g., “It’s really hard to change how I feel, especially to be happier” Participant #1, female, age 20), and three reported having low DT. Three participants stated feeling “overwhelmed” by emotions, and two individuals described experiencing intense, extreme emotions (e.g., “When they are good, they are really good, and when they are bad, they are really bad. My emotions are very strong” Participant #2, female, age 32). Only one individual indicated feeling confident in his ability to manage his emotions and cope with distress effectively. Three participants noted a significant discrepancy between what other people see and their own perceptions (e.g., “forcing a smile” or “faking it” for the benefit of others, while internally experiencing sadness, depression, or anxiety).

General coping. While all seven participants identified using at least one adaptive coping strategy (e.g., engaging in a pleasant activity/hobby, seeking social support, prioritizing self-care), only two individuals reported effective use of problem-solving. Participants noted a tendency toward situational or experiential avoidance (n = 7), social withdrawal/isolation (n = 4), and reliance on safety behaviors (n = 3) to cope with distress (e.g., “Functions with a lot of
people, I get really nervous and I don’t want to talk to anyone—and like if I just put myself out there I would have a good time but then I retreat and like get really worked up about everything and have really bad anxiety about situations…” Participant #6, female, age 18).

**Negative perceptions of self.** All seven participants made references to negative self-talk, including self-criticism \( n = 6 \), self-judgments about NSSI \( n = 2 \), or deserving to be punished \( n = 2 \). Most participants had a poor self-concept, as evidenced by comments about low self-worth \( n = 5 \), appearance concerns \( n = 2 \), or upward comparisons to others \( n = 1 \).

**Attitudes about NSSI.** All seven participants voiced negative attitudes about NSSI, and six commented on the addictive aspects of NSSI (e.g., referring to NSSI as “like a drug” or using addiction language such as “urge” or “relapse”). Most participants viewed others who self-harm in a negative light \( n = 5 \), but two individuals talked about having compassion. All seven participants characterized NSSI online content as having harmful effects, including “glorifying” or “encouraging” NSSI, triggering urges, and exchanging NSSI methods rather than solutions. Four participants felt that NSSI is misrepresented in the media and popular culture, either by being demonized, not taken seriously, or overdramatized/romanticized.

**Precipitating factors.** We defined precipitating factors as variables that were closely temporally associated with the occurrence of NSSI (e.g., the presence of negative thoughts or emotions prior to an episode of NSSI). Subthemes coded within this domain \( n = 137 \) narratives) were categorized based on the perceived function of NSSI and triggers/antecedents of NSSI.

**Perceived function of NSSI.** The most common motivations for NSSI were linked to *intrapersonal (internal) functions*, including emotion/affect regulation \( n = 6 \), self-punishment \( n = 5 \), to feel something \( n = 3 \), or regain/maintain control \( n = 3 \). While *interpersonal (social/relational) functions* were less common, three individuals used NSSI to avoid hurting or bothering others, escape a stressful social encounter, resolve a conflict, or receive comfort.
**Triggers/antecedents of NSSI.** Participants endorsed a variety of triggers that would precipitate NSSI, including internal (e.g., negative emotions or thoughts) and social/relational antecedents of NSSI. All seven participants endorsed negative mood states as triggers for NSSI, including anxiety/worry/panic (*n* = 5), feeling overwhelmed or out of control (*n* = 4), sadness or depressed mood (*n* = 3), aggression or anger (*n* = 3), or numbness or apathy (*n* = 3). Six participants reported specific negative thoughts before NSSI, and some described cognitive processes leading up to NSSI (e.g., rumination, *n* = 3; urges, *n* = 2; worry/obsessive thoughts, *n* = 1). Social/relational triggers were also fairly common, with familial conflict (*n* = 3) or perceived rejection (*n* = 3) as the most cited examples. Other triggers included stress (*n* = 4), NSSI websites (*n* = 3), trauma reminders (*n* = 1), peer NSSI (*n* = 1), and scars from past NSSI (*n* = 1).

**General NSSI behavior.** Subthemes coded within this category (*n* = 118 narratives) pertained to techniques/methods of NSSI, the onset and occurrence of NSSI, and a typical episode of NSSI. All seven participants reported using multiple methods of NSSI (*M* = 5.0, *SD* = 2.0, range 3-8 methods), and the most common techniques included: *hitting* (*n* = 6), *cutting/carving skin* (*n* = 5), *picking/excoriation* (*n* = 4), *biting* (*n* = 4), *scratching or scraping* (*n* = 3), and *pulling hair* (*n* = 3). Less prevalent methods included: *burning skin, inserting objects under skin/nails, rubbing/erasing skin, pinching,* and *using extreme cold* (*n* = 2 for each). One participant reported using *food restriction for discomfort, stopping breathing, and spending money frivolously* as techniques aimed at self-punishment. NSSI was characterized as an impulsive or unconscious behavior (*n* = 5) that could also be more thought out or pre-planned (*n* = 3). NSSI was generally performed in private (*n* = 3) and often accompanied by crying (*n* = 4).

**Consequences and concealment issues.** Subthemes coded within this domain (*n* = 100 narratives) reflected specific consequences of NSSI and concealment issues.
**Consequences of NSSI.** Participants described emotional \((n = 7)\), cognitive \((n = 5)\), behavioral \((n = 4)\), social/relational \((n = 4)\), and physical \((n = 3)\) consequences of NSSI. A sense of relief or release was the most common consequence of NSSI endorsed by all participants, followed by exhaustion \((n = 4)\), negative responses from others \((n = 3)\), and self-disparagement regarding NSSI \((n = 3)\). Three participants reported physical pain following NSSI, with some individuals preferring certain methods (e.g., scratching) because the burning sensation lingers after NSSI (e.g., “even a couple hours after that, when I can still feel the burning and—I supposed I just get reminded that I deserved it” Participant #1, female, age 20).

**Concealment issues.** Six participants reported intentionally keeping NSSI a secret, some citing efforts to avoid telling others \((n = 4)\). Two participants described not wanting to worry others as a reason for concealing NSSI, and two used specific methods that were easier to hide.

**Comorbidity and treatment.** Subthemes coded within this domain \((n = 92\) narratives) pertained to comorbid psychiatric conditions and psychological or medical treatment.

**Comorbid psychiatric conditions.** While the presence of psychopathology was not formally assessed, participants spontaneously mentioned either having symptoms or a diagnosis of a variety of psychological disorders, including anxiety \((n = 7)\), depression or bipolar disorder \((n = 3)\), eating disorder \((n = 2)\), borderline personality disorder \((n = 1)\), and ADHD \((n = 1)\). Past suicidal ideation was reported by three participants and one individual described having issues with substance misuse. Anxiety was a theme that came up repeatedly throughout each interview and participants spoke about having social anxiety, panic attacks, specific phobias, and significant worry. Moreover, anxiety was spontaneously mentioned by three participants in response to the first interview question about general coping strategies: “So, I tend to panic, if it’s really overwhelming, just wanted to go to bed—but if it’s even more overwhelming, then I will have thoughts of hurting myself” (Participant #2, female, age 32); “In general, I have
anxiety so I learned a few anxiety coping mechanisms” (Participant #4, female, age 20);
“Usually I panic first” (Participant #5, female, age 22).

**Psychological or medical treatment.** Six participants mentioned attending outpatient psychotherapy, and two made positive attributions about therapy. One participant talked about her experience with inpatient psychiatric hospitalizations, describing how she learned new NSSI techniques from other patients: “From the end of 8th grade till the end of sophomore year, I was in various inpatient and like different homes and stuff… obviously in the hospital you can’t have scissors or anything sharp—pretty much all those places all that kinda stuff is well regulated—so that’s when a lot of the picking started… or things I didn’t need sharp things for basically” (Participant #6, female, age 18). Five individuals talked about taking prescribed medications or seeing a psychiatrist, and most made positive attributions about medication ($n = 4$). No participants voiced any negative comments about their experiences with psychotherapy or psychiatry. Only one participant had ever received medical treatment for NSSI.
DISCUSSION

The present mixed-method two-part study adds to the growing body of literature on NSSI among college students. We investigated multiple dimensions of NSSI, including the prevalence and correlates, diagnostic classification, psychological vulnerability factors, and functions of NSSI among students presenting for treatment at a university counseling center. Specifically, we assessed the prevalence and correlates of NSSI and diagnosable NSSI disorder in the overall sample, examined the relationship between AS, DT, and NSSI, and explored the lived experiences of a select group of individuals with repeated lifetime NSSI. We approached the research questions from multiple perspectives, incorporating the strengths of quantitative rigor and the richness of qualitative data, and analyzed the narrative data using two complimentary methods: the thorough and systematic procedure of thematic analysis and the creation of word clouds that visually highlight more prominent themes from the interviews.

Prevalence and Correlates of NSSI

More than a third of the participants in our sample endorsed lifetime NSSI. Consistent with previous research, most individuals reported onset of NSSI in the early teens (Nock, 2009). However, several individuals in our sample reported NSSI as early as age six or eight, with the latest onset of NSSI at age 23. Alarmingly, more than twenty percent of participants reported more than 50 lifetime episodes of NSSI, and nearly two thirds had engaged in NSSI in the past year. Only one participant endorsed a single episode of NSSI, which suggests that NSSI may become habitual for most individuals, with repeated episodes being the norm. As predicted, we found no significant differences between the NSSI and No NSSI group with respect to any of the demographic variables that were assessed. Similarly, gender differences were not observed for most of the NSSI-related variables, with the exception of type of NSSI methods and perceived interference in functioning due to NSSI. Consistent with prior research, females were more likely
to use scratching/scraping or excoriation (e.g., Laye-Gindhu & Schonert-Reichl, 2005), but no other methods differed significantly based on gender. We observed a trend in the data indicating less support from family among those with a history of NSSI, which suggests that lifetime NSSI may be associated with poorer family relationships. Further research is needed to elucidate whether higher levels of perceived family support are associated with better outcomes among individuals who engage in NSSI. This could have possible clinical implications because involving family members may have a positive impact on treatment outcome.

We also found that individuals with lifetime NSSI were more likely to have searched for NSSI-related online content, and several participants noted being highly triggered when visiting websites, forums, or discussion boards devoted to self-injury. Individuals with a history of NSSI were also more likely to personally know someone who had engaged in NSSI. Taken together, these findings highlight the negative impact of social media and online representations of NSSI, and also point to the powerful effects of peer influence on NSSI behavior. This has important clinical and policy implications. Some websites have already banned NSSI-related material (e.g., Tumblr), but effectively moderating online content can be challenging. Thus, finding ways to limit the access of teens to pro-NSSI websites is an important endeavor (e.g., parental controls).

**NSSI Disorder**

The present study assessed for the presence of NSSI disorder in a clinical sample of college students using the most current diagnostic criteria published in *DSM-5*. Nearly ten percent of the overall sample and five out of seven interview participants met full *DSM-5* criteria for NSSI disorder. According to *DSM-5* (APA, 2013), a diagnosis of NSSI disorder can be assigned if an individual has engaged in NSSI on five or more days in the past year (Criterion A), with the expectation to obtain relief from a negative feeling or cognitive state, induce a positive feeling state, or resolve an interpersonal difficulty (Criterion B). Additionally, NSSI...
must be preceded by negative feelings or thoughts, a period of preoccupation with NSSI, or frequent urges to engage in NSSI (Criterion C). As with many other psychological diagnoses, NSSI must cause clinically significant distress or impairment in functioning (Criterion E), cannot be socially sanctioned (Criterion D), or better explained by another condition (Criterion F).

In terms of clinical correlates, individuals with NSSI disorder in our sample were characterized by a tendency to cognitively appraise emotional situations as unacceptable, become more absorbed by negative emotions, and experience mental incapacitation (i.e., cognitive dyscontrol). Our results provide additional evidence suggesting that individuals with NSSI disorder tend to exhibit with more dysfunction. To date, few studies have examined the existence of NSSI disorder, and most were conducted prior to the publication of *DSM-5* using the proposed criteria for NSSI disorder that was subsequently altered (e.g., Selby et al., 2012; Glenn & Klonsky, 2013; Zetterqvist et al., 2013). In a recent review of the literature, Zetterqvist (2015) identified 16 published studies that presented empirical data on NSSI disorder, only four of which had been conducted using the current *DSM-5* criteria (Andover, 2014; Fischer et al., 2014; Gratz, Dixon-Gordon, Chapman, & Tull, 2015; Washburn, Potthoff, Juzwin, & Styer, 2014). Consistent with previous research documenting less endorsement of Criterion E among some individuals (e.g., Zetterqvist, 2015), four participants in our sample satisfied Criterion A-D, but denied significant distress or impairment due to NSSI. Some have argued that the current NSSI disorder criteria are overly inclusive, and emerging research suggests that the frequency and recency thresholds may be too liberal (i.e., Criterion A). In a recent study, individuals with fewer than 10 lifetime NSSI episodes (occurring more than 12 months ago) endorsed less severe psychopathology, lower distress, and less impairment (Muehlenkamp and Brausch, 2015). Additional research is needed to evaluate the diagnostic validity of NSSI disorder, and to better understand what differentiates individuals who have engaged in limited NSSI from those
exhibiting greater severity, distress, and interference in functioning.

Surprisingly, we found a notable gender difference with respect to impairment due to NSSI. Females were significantly more likely than males to endorse interference in social or occupational functioning as a result of NSSI, but both genders reported similar levels of distress related to NSSI. We propose that this gender difference in perceived interference from NSSI could be one contributing factor that explains why, as a group, females are more likely to seek counseling or therapy in general (Clement et al., 2015). This has potential clinical and policy implications. Given that males are less likely to seek professional help for psychological problems, perhaps the rate of help-seeking among men could be enhanced if NSSI were to be seen as causing more interference in functioning. Men also might be more affected by stigma as a barrier to treatment for NSSI, given that there are wide-spread stereotypes that “NSSI is for teenage girls.” Thus, campaigns aimed at spreading awareness that boys and men also struggle with NSSI could be particularly beneficial for males. Moreover, outreach programs emphasizing the detrimental effects of NSSI may help normalize the dysfunction and impairment caused by NSSI, which may increase the likelihood that men view NSSI as interfering and seek treatment.

**Anxiety Sensitivity, Distress Tolerance, and NSSI**

Consistent with what we expected, lifetime NSSI was significantly associated with lower capacity to tolerate distress. Given that NSSI can lead to immediate reductions in negative affect (Klonsky, 2009), self-harm can be highly rewarding for individuals with low DT. While AS was not significantly higher among individuals with a history of NSSI, thus failing to support our hypothesis, our data did reveal a trend in this direction. We speculate that the null finding could be due to several factors. First, it is possible that our sample was not large enough to reveal a meaningful effect. Second, perhaps another measure of anxiety would have revealed the presence of clinically significant symptoms, such as worry. Third, we used self-report measures, which
have inherent limitations, and a clinician-rated instrument may have been more accurate in
detecting AS and anxiety symptomatology more generally. The lack of support for our
hypothesis was nevertheless somewhat surprising, given that DT was significantly lower among
individuals with lifetime NSSI, and existing research has supported an inverse relationship
between AS and DT (e.g., Anestis et al., 2007; Bernstein et al., 2009; Keogh et al., 2010). In a
recent study examining vulnerability factors for compulsive hoarding, AS and DT interacted
such that low DT was significantly associated with increased hoarding symptoms among
individuals with high AS, a finding that was not observed in individuals with low AS (Timpano,
Buckner, Richey, Murphy, & Schmidt, 2009). In our sample, DT appeared to be incrementally
related to NSSI, but the relationship between AS and NSSI remains unclear. Future research is
needed to determine whether a similar interactional model involving AS and DT applies to NSSI.

**Lived Experiences and Functions of NSSI Among University Students**

Nock and Prinstein’s (2004) integrative theoretical model of the development and
maintenance of NSSI makes several propositions. First, NSSI is performed repeatedly because it
immediately regulates affect/cognition or influences the social environment. Second, certain
individuals may be more predisposed to difficulties in emotion regulation, cognitive deficits, or
inadequate social skills. For example, distal risk factors (e.g., genetic predisposition for high
emotional/cognitive reactivity, childhood abuse, invalidating family environments), intrapersonal
vulnerability factors (e.g., poor DT, high negative emotionality, negative cognitive style), and
interpersonal vulnerability factors (e.g., poor communication skills, deficits in social problem-
solving) increase the likelihood that an individual will engage in NSSI. Finally, factors
specifically related to self-injury (e.g., pain analgesia, self-punishment, social learning) may lead
individuals to choose NSSI over other behaviors in order to serve the aforementioned
intrapersonal and interpersonal functions (Nock, 2009; 2010). We identified a number of
biological, environmental, psychological, and behavioral risk/vulnerability factors for NSSI through thematic analysis of the qualitative interviews, and data-derived themes support both intrapersonal (internal/automatic) and interpersonal (social/relational) functions of NSSI.

Prior to engaging in NSSI, interview participants reported experiencing negative emotions (e.g., feeling overwhelmed, sad, frustrated), and felt calm and relieved after NSSI. This is in line with previous research showing that NSSI is associated with improvements in affect and decreases in emotional arousal among young adults (Klonsky, 2009). Consistent with the theory that NSSI often functions to help individuals escape or avoid negative emotions, NSSI has been associated with unwillingness to experience emotional distress. Gratz and colleagues (2011) found that individuals with a history of NSSI showed less willingness to tolerate emotional distress (indexed by time to termination on a frustration-induction task), as well as heightened physical pain tolerance under conditions of interpersonal distress. Consistent with prior research, our findings support the idea that individuals who engage in NSSI may use the physical pain to distract from emotional pain (Gratz et al., 2011). For some individuals, acceptance-based and/or exposure-based interventions targeting negative emotions may be more effective.

While we did not formulate a formal hypothesis about NSSI methods, we were surprised that the most common form of NSSI was punching/hitting, given that NSSI is generally most associated with cutting or scraping that results in tissue damage (Nock & Prinstein, 2005). The qualitative interviews provided some interesting insights into the possible motivations for utilizing non-tissue-damaging methods for NSSI, namely the that these methods do not leave scars or other evidence of self-harm, are readily available to individuals without requiring special implements, and can even be done discretely in the presence of others. Moreover, the interviews shed light onto less typical methods of NSSI, including using extreme cold to create discomfort, withholding food for self-punishment in the absence of an eating disorder, pinching or using
pressure to the point of causing pain, or attempts to stop breathing for a period of time. At face
value, these non-lethal NSSI methods may seem to some degree less worrisome. However, we
argue that any form of NSSI is deleterious, and intent to inflict self-harm itself can be indicative
of other underlying psychological issues that warrant clinical attention. We propose that the
motivations and functions of NSSI are more relevant than the specific methods, particularly
when an individual has substantial self-hatred or feels deserving to be unjustly punished, as was
observed in our study. Based on our findings and existing research, the presence of any form of
NSSI is strongly suggestive of a deficit in emotion regulation, and emotion dysregulation is a
hallmark of many psychological disorders (e.g., Bradley et al., 2011; Racine & Wildes, 2013).
Thus, NSSI can be viewed as both a symptom of an underlying issue and as a problematic
condition by itself, especially when referring to the more severe cases of NSSI disorder.

Consistent with prior research, in our study lifetime NSSI was associated with a history
of abuse or assault (e.g., Weierich & Nock, 2008. Common reactions to trauma include increased
arousal, re-experiencing symptoms, and negative alterations in thoughts and mood, which can
lead to hypervigilance and avoidance behaviors (Foa, Hembree, Riggs, Rauch, & Franklin,
2001). Theorists have proposed that higher rates of NSSI among individuals with trauma may be
more related to the emotional response to trauma (Glassman et al., 2007), or common underlying
risk factors (Klonsky & Moyer, 2008), rather than the traumatic experience per se. More research
is needed to examine how emotional responses in general might increase risk for NSSI.

Despite there being no significant differences in AS based on history of NSSI, anxiety
was by far the single most common theme elicited by interview participants. This highlights the
relevance of anxiety as a predictor for NSSI as an important area for further study. In our study,
increased NSSI was associated with the tendency to cognitively appraise distress as intolerable,
attentional focus on negative emotions, and greater endorsement of fears of losing mental control
when distressed. Coupled with the presence of rumination and negative cognitive style among interviewees, our findings underscore the importance of better understanding how cognitive factors may influence efforts aimed at coping, including maladaptive strategies such as NSSI.

Previous research indicates that NSSI often co-occurs with eating disorders (e.g., Muehlenkamp et al., 2011), with some prevalence estimates of self-harm ranging from 18% to 40% among eating disordered patients (e.g., Sansone & Levitt, 2002). While we did not formally assess for eating disorders, two female interview participants spontaneously reported having a long history of struggling with disordered eating. It has been proposed that disordered eating behaviors (e.g., binging, purging) can be prompted by negative emotions, comparable to the typical antecedents of NSSI (Jeppson, Richards, Hardman, & Granley, 2003). Research has supported the theory that individuals experiencing eating disorders and NSSI have a shared vulnerability for emotion dysregulation (Muehlenkamp et al., 2012a). One female participant interviewed spontaneously reported having a diagnosis of BPD, and noted having experienced multiple psychiatric hospitalizations. Previous research has shown that as many as 75-80% of individuals with BPD have engaged in NSSI (e.g., Cowdry, Pickar, & Davies, 1985). The association between NSSI and BPD is not surprising, given that both conditions share core features of negative emotionality and deficits in emotion regulation (Brown et al., 2002).

Some participants in the present study talked about a period of emotional “numbness” prior to NSSI, which is consistent with previous research showing that NSSI is used to stop or prevent dissociation from occurring (Chapman et al., 2006). While by definition, NSSI involves self-harm in the absence of suicidal intent, the findings from this study are consistent with previous research supporting NSSI as a risk factor for suicide. Joiner (2005) has posited that NSSI may serve as “practice” for other potentially lethal behaviors through pain desensitization and habituation to self-inflicted harm. Suicide risk has been shown to increase as the frequency
and severity of NSSI accelerates (Whitlock et al., 2008), and risk is elevated among individuals who use multiple methods of NSSI (Nock et al., 2006). Individuals who engage in frequent NSSI may eventually turn to suicide if NSSI becomes less effective as an emotion regulation strategy, and some may become suicidal as a result of isolation, profound loneliness, or perceived burdensomeness and incompetence (Joiner, 2005; Walsh, 2006). Moreover, accidental lethality could be an inadvertent consequence of NSSI. Despite NSSI and suicide being conceptualized as distinct behaviors, lifetime NSSI increases the risk of suicidal behavior, underscoring the importance of routine comprehensive suicide risk assessment for individuals engaging in NSSI.

For most participants with lifetime NSSI, self-harm was an ongoing problem, underscoring the importance of regular screenings for NSSI and thorough assessment of NSSI, particularly among high-risk populations. Prevention and outreach efforts targeting NSSI are not only crucial to have on college campuses, but they are also important for middle and high school students, and given the early age of onset observed in our sample, one could argue that prevention should begin as early as elementary school. In recent years, mindfulness-based therapeutic interventions have become increasingly popular among clinicians (Baer, 2015), but also in mainstream culture (Booth, 2015). We argue that mindfulness could be one strategy for enhancing emotion regulation skills among children and adolescents, which could in turn reduce the prevalence of NSSI among youth. The term “mindfulness” encompasses a non-judgmental present-focused way-of-being, emphasizing emotional awareness, observation, and acceptance of both internal and external experiences. Emerging research supports the feasibility and benefits of mindfulness programs in school settings (for reviews, see Meiklejohn et al., 2012; Zenner et al., 2014), and numerous studies support the efficacy of mindfulness in treating a variety of psychological problems (e.g., depression, anxiety, stress; for review, see Khoury et al., 2013).

In our study, individuals with lifetime NSSI reported difficulty managing emotions and
reduced capacity to tolerate distress. *Dialectical Behavior Therapy (DBT)* is an evidence-based cognitive-behavioral treatment that enhances skills in the areas of DT, emotion regulation, and interpersonal effectiveness (Linehan, 1993a, 2015). *DBT* was originally developed to treat BPD but has been subsequently adapted for a wide range of presenting concerns with promising results (Dimeff & Koerner, 2007). Mindfulness is a core component of *DBT* and mindfulness-based therapies could be effective in treating NSSI that occurs outside the context of BPD.

While, to date, no empirically-supported treatments for NSSI exist, a randomized-controlled trial comparing group mindfulness-based cognitive therapy (MBCT) and group support for NSSI is currently underway (Rees, Hasking, Breen, Lipp, & Mamotte, 2015). The dearth of studies examining psychological interventions for treating NSSI warrants further efficacy research and in-depth exploration into mechanisms of change during the course of treatment for NSSI.

**Limitations and Strengths of the Current Study**

While the current study adds to the growing body of literature on NSSI, our results should be interpreted in light of several limitations. First, we used convenience sampling to recruit participants from the counseling center at a large public university in the Northeast, and possible geographical effects and selection bias could limit the generalizability of our findings. Moreover, our sample consisted of students who were already seeking psychological treatment, and these results may not generalize to non-clinical settings. Second, we exclusively used self-report measures with high face validity in Study 1, and there were relatively few participants who completed the interview in Study 2. Finally, it could be possible that individuals who engage in NSSI and also struggle with significant anxiety may be less likely to seek treatment, thus they would not be adequately represented in our sample. Anxiety itself could be a barrier to help seeking, and it is possible that the rates of AS might be higher in samples that were recruited more broadly, such as the university at large. This study highlights the need to further
explore the role of anxiety (and AS) as a potential vulnerability factor for NSSI.

Despite these limitations, the present study also has a number of strengths. First, the sample in Study 1 was fairly diverse in terms of gender, race/ethnicity, religion, and sexual orientation, and almost half of the interview participants identified as non-White. Second, this study also adds to the limited body of literature on NSSI disorder by examining the prevalence within a treatment-seeking university population. Third, the qualitative interviews provide important insights into the motivation and techniques for engaging in what could be considered atypical or non-traditional self-harming behaviors (e.g., withholding food, pinching, punching, extreme cold, scratching to minimize scars and feel the burn later).

Conclusions

Taken together, our findings provide evidence that NSSI is significant public health concern on college campuses. To our knowledge, this is the first study to investigate AS, DT, and NSSI concomitantly in a clinical sample of college students. Individuals with a history of NSSI had significantly lower perceived capacity to tolerate distress. This finding supports the need for educational programs that teach DT and healthy coping skills to children and adolescents. As a newly added condition for further study in DSM-5, there has been limited research on NSSI disorder, and the present study adds to the emerging literature in this area. Additionally, insights gleaned from the qualitative interviews lend richness and depth to the research, and provide valuable perspectives otherwise unobtainable. Many participants reported engaging in NSSI methods that would not necessarily result in tissue damage. The findings from this study highlight the need for thorough assessment of a range of self-harming behaviors, such as withholding food (outside the context of an eating disorder), using extreme cold, punching/hitting, and pinching. Future research is needed to identify effective prevention strategies and interventions for NSSI to reduce the prevalence of this debilitating condition.
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Table 1

Demographic Characteristics By Group

<table>
<thead>
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<th>Variable</th>
<th>Full sample a</th>
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</tr>
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<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>51.5%</td>
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<td>58.3%</td>
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<td>1</td>
<td>2.1%</td>
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<td>Race/ethnicity</td>
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<td></td>
</tr>
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<td>92</td>
<td>71.9%</td>
<td>35</td>
<td>72.9%</td>
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<td>Asian</td>
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<td>10.9%</td>
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<td>4.2%</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
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<td>7.0%</td>
<td>6</td>
<td>12.5%</td>
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<td>Black</td>
<td>5</td>
<td>3.9%</td>
<td>1</td>
<td>2.1%</td>
</tr>
<tr>
<td>Mixed race</td>
<td>5</td>
<td>3.9%</td>
<td>3</td>
<td>6.2%</td>
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<tr>
<td>Other</td>
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<td>1.6%</td>
<td>1</td>
<td>2.1%</td>
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<tr>
<td>Unknown</td>
<td>1</td>
<td>0.8%</td>
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<td></td>
</tr>
<tr>
<td>Sexual orientation</td>
<td></td>
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<tr>
<td>Heterosexual</td>
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<td>77.3%</td>
<td>31</td>
<td>64.6%</td>
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<tr>
<td>Bisexual</td>
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<td>7.8%</td>
<td>5</td>
<td>10.4%</td>
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<tr>
<td>Homosexual</td>
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<td>1.6%</td>
<td>2</td>
<td>4.2%</td>
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<td>Pansexual</td>
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<td>Questioning</td>
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<td>Unknown</td>
<td>13</td>
<td>10.1%</td>
<td>9</td>
<td>18.7%</td>
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<tr>
<td>Variable</td>
<td>Full sample $^a$</td>
<td>NSSI $^b$</td>
<td>No NSSI $^c$</td>
<td></td>
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<tr>
<td>--------------</td>
<td>------------------</td>
<td>-----------</td>
<td>-------------</td>
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</tr>
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<td></td>
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<td>%</td>
<td>$n$</td>
<td>%</td>
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<td>Christianity</td>
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<td>20.8%</td>
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<td>Islam</td>
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<td>2.3%</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Buddhism</td>
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<td>2.3%</td>
<td>1</td>
<td>2.1%</td>
</tr>
<tr>
<td>Judaism</td>
<td>1</td>
<td>0.8%</td>
<td>1</td>
<td>2.1%</td>
</tr>
<tr>
<td>Unitarian</td>
<td>1</td>
<td>0.8%</td>
<td>1</td>
<td>2.1%</td>
</tr>
<tr>
<td>Hindu</td>
<td>1</td>
<td>0.8%</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Bahai</td>
<td>1</td>
<td>0.8%</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Mandaean</td>
<td>1</td>
<td>0.8%</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Paganism</td>
<td>1</td>
<td>0.8%</td>
<td>1</td>
<td>2.1%</td>
</tr>
<tr>
<td>Deism</td>
<td>1</td>
<td>0.8%</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Unknown</td>
<td>24</td>
<td>18.7%</td>
<td>8</td>
<td>16.7%</td>
</tr>
</tbody>
</table>

$^a n = 128$.  $^b n = 48$.  $^c n = 80$. 
### Table 2

**Frequency of Non-Suicidal Self-Injury By Gender**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Females(^{a})</th>
<th>Males(^{b})</th>
<th>(X^2)</th>
<th>df</th>
<th>sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of days past year</strong></td>
<td></td>
<td></td>
<td>4.56</td>
<td>6</td>
<td>.602</td>
</tr>
<tr>
<td>Not at all</td>
<td>9    32.2%</td>
<td>9    47.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 day</td>
<td>2    7.1%</td>
<td>1    5.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 days</td>
<td>6    21.4%</td>
<td>3    15.8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-10 days</td>
<td>7    25.0%</td>
<td>2    10.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-15 days</td>
<td>—    —</td>
<td>1    5.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-25 days</td>
<td>3    10.7%</td>
<td>3    15.8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>51-100 days</td>
<td>1    3.6%</td>
<td>—    —</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Number of days past month</strong></td>
<td></td>
<td></td>
<td>5.22</td>
<td>5</td>
<td>.389</td>
</tr>
<tr>
<td>Not at all</td>
<td>16   57.1%</td>
<td>13   68.4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 day</td>
<td>7    25.0%</td>
<td>2    10.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 days</td>
<td>4    14.3%</td>
<td>2    10.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-10 days</td>
<td>—    —</td>
<td>1    5.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-15 days</td>
<td>—    —</td>
<td>1    5.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nearly every day</td>
<td>1    3.6%</td>
<td>—    —</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Number of days past week</strong></td>
<td></td>
<td></td>
<td>.034</td>
<td>1</td>
<td>.853</td>
</tr>
<tr>
<td>Not at all</td>
<td>23   82.1%</td>
<td>16   84.2%</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1 day</td>
<td>5    17.9%</td>
<td>3    15.8%</td>
<td></td>
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</table>
Table 2 (continued)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Females&lt;sup&gt;a&lt;/sup&gt;</th>
<th></th>
<th>Males&lt;sup&gt;b&lt;/sup&gt;</th>
<th></th>
<th>X&lt;sup&gt;2&lt;/sup&gt;</th>
<th>df</th>
<th>sig.</th>
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<tbody>
<tr>
<td>Time since last episode</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Today</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>5.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 week ago</td>
<td>6</td>
<td>21.4%</td>
<td>3</td>
<td>15.8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 weeks ago</td>
<td>4</td>
<td>14.3%</td>
<td>1</td>
<td>5.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 month ago</td>
<td>5</td>
<td>17.9%</td>
<td>4</td>
<td>21.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 months ago</td>
<td>2</td>
<td>7.1%</td>
<td>2</td>
<td>10.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 year ago</td>
<td>2</td>
<td>7.1%</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 years ago</td>
<td>3</td>
<td>10.7%</td>
<td>3</td>
<td>15.8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 years ago</td>
<td>5</td>
<td>17.9%</td>
<td>2</td>
<td>10.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than 5 years ago</td>
<td>1</td>
<td>3.6%</td>
<td>3</td>
<td>15.8%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> n = 28,  <sup>b</sup> n = 19.

All p-values > .05.
Table 3

Prevalence and Severity of Non-Suicidal Self-Injury By Gender

<table>
<thead>
<tr>
<th>Measure</th>
<th>Females&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Males&lt;sup&gt;b&lt;/sup&gt;</th>
<th>X&lt;sup&gt;2&lt;/sup&gt;</th>
<th>df</th>
<th>sig.</th>
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</thead>
<tbody>
<tr>
<td><strong>Lifetime episodes</strong></td>
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<td></td>
<td>2.92</td>
<td>7</td>
<td>.407</td>
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<tr>
<td>Once</td>
<td>—</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-3 times</td>
<td>5</td>
<td>1</td>
<td></td>
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<tr>
<td>4-5 times</td>
<td>4</td>
<td>3</td>
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<td>6-10 times</td>
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<td>11-20 times</td>
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<td>1</td>
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<tr>
<td><strong>Severity of NSSI</strong></td>
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<td>2.83</td>
<td>3</td>
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<tr>
<td>Minor</td>
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<td></td>
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<td></td>
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<tr>
<td>Moderate</td>
<td>8</td>
<td>4</td>
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<td></td>
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<td>Severe</td>
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<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extreme</td>
<td>6</td>
<td>4</td>
<td></td>
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</table>

<sup>a</sup> n = 28.  <sup>b</sup> n = 19.
All p-values > .05.
Table 4

Summary of Means and Standard Deviations for Distress Tolerance Scale and Anxiety Sensitivity Index Overall Scores and Subscale Scores According to NSSI Group

<table>
<thead>
<tr>
<th>Measure</th>
<th>NSSI(^a)</th>
<th>No NSSI(^b)</th>
<th>t</th>
<th>df</th>
<th>sig.</th>
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<tbody>
<tr>
<td></td>
<td>M</td>
<td>(SD)</td>
<td>M</td>
<td>(SD)</td>
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</tr>
<tr>
<td>Distress Tolerance Scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall score</td>
<td>35.71 (12.03)</td>
<td>42.21 (12.28)</td>
<td>2.92</td>
<td>126</td>
<td>.004**</td>
</tr>
<tr>
<td>Tolerance</td>
<td>2.48 (1.07)</td>
<td>2.84 (1.01)</td>
<td>-1.90</td>
<td>126</td>
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<tr>
<td>Absorption</td>
<td>2.08 (0.95)</td>
<td>2.45 (1.02)</td>
<td>-2.03</td>
<td>126</td>
<td>.044*</td>
</tr>
<tr>
<td>Appraisal</td>
<td>2.44 (0.91)</td>
<td>2.95 (0.91)</td>
<td>-3.07</td>
<td>126</td>
<td>.003**</td>
</tr>
<tr>
<td>Regulation</td>
<td>2.47 (1.01)</td>
<td>2.88 (0.95)</td>
<td>-2.35</td>
<td>126</td>
<td>.021*</td>
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<tr>
<td>Anxiety Sensitivity Index</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall score</td>
<td>28.96 (12.55)</td>
<td>25.71 (12.85)</td>
<td>1.40</td>
<td>126</td>
<td>.165</td>
</tr>
<tr>
<td>Physical Concerns</td>
<td>13.19 (7.54)</td>
<td>11.18 (7.20)</td>
<td>1.50</td>
<td>126</td>
<td>.135</td>
</tr>
<tr>
<td>Cognitive Concerns</td>
<td>7.50 (4.34)</td>
<td>6.44 (4.58)</td>
<td>1.30</td>
<td>126</td>
<td>.198</td>
</tr>
<tr>
<td>Social Concerns</td>
<td>7.04 (2.22)</td>
<td>7.05 (2.32)</td>
<td>-0.02</td>
<td>126</td>
<td>.984</td>
</tr>
</tbody>
</table>

\(^a\) \(n = 48\). \(^b\) \(n = 80\).
* \(p \leq .05\)  ** \(p \leq .01\)
Table 5

Correlations among Severity of NSSI and Subscales on the Anxiety Sensitivity Index and Distress Tolerance Scale

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Severity of NSSI</td>
<td></td>
<td>.114</td>
<td>.151</td>
<td>.053</td>
<td>-.178*</td>
<td>-.246**</td>
<td>-.323***</td>
<td>-.217*</td>
</tr>
<tr>
<td>2. ASI Physical Concerns</td>
<td>.114</td>
<td></td>
<td></td>
<td>.628***</td>
<td>.486***</td>
<td>-.325***</td>
<td>-.327***</td>
<td>-.343***</td>
</tr>
<tr>
<td>3. ASI Cognitive Concerns</td>
<td>.151</td>
<td>.628***</td>
<td></td>
<td></td>
<td>.602***</td>
<td>-.483***</td>
<td>-.455***</td>
<td>-.493***</td>
</tr>
<tr>
<td>4. ASI Social Concerns</td>
<td>.053</td>
<td>.486***</td>
<td>.602***</td>
<td></td>
<td></td>
<td>-.346***</td>
<td>-.349***</td>
<td>-.328***</td>
</tr>
<tr>
<td>5. DTS Tolerance</td>
<td>-.178*</td>
<td>-.325***</td>
<td>-.483***</td>
<td>-.346***</td>
<td></td>
<td></td>
<td>.762***</td>
<td>.665***</td>
</tr>
<tr>
<td>6. DTS Absorption</td>
<td>-.246**</td>
<td>-.327***</td>
<td>-.455***</td>
<td>-.349***</td>
<td>.762***</td>
<td></td>
<td></td>
<td>.728***</td>
</tr>
<tr>
<td>7. DTS Appraisal</td>
<td>-.323***</td>
<td>-.343***</td>
<td>-.493***</td>
<td>-.328***</td>
<td>.665***</td>
<td>.728***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. DTS Regulation</td>
<td>-.217*</td>
<td>-.150</td>
<td>-.358***</td>
<td>-.283***</td>
<td>.494***</td>
<td>.430***</td>
<td>.534***</td>
<td></td>
</tr>
</tbody>
</table>

Note: ASI = Anxiety Sensitivity Index; DTS = Distress Tolerance Scale.

\[ n = 128. \]

* \( p \leq .05 \)  ** \( p \leq .01 \)  *** \( p \leq .001 \)
Table 6

*Total Counts of Major Themes and Broad Domains Coded for Each Interview Participant*

<table>
<thead>
<tr>
<th>Major themes</th>
<th>Qualitative interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#1</td>
</tr>
<tr>
<td><strong>Predisposing Factors</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>1. Environmental factors</td>
<td>0</td>
</tr>
<tr>
<td>2. Sociocultural influences on NSSI</td>
<td>7</td>
</tr>
<tr>
<td>3. Emotion regulation skills</td>
<td>3</td>
</tr>
<tr>
<td>4. General coping strategies</td>
<td>5</td>
</tr>
<tr>
<td>5. Perceptions of self</td>
<td>13</td>
</tr>
<tr>
<td>6. Attitudes about NSSI</td>
<td>6</td>
</tr>
<tr>
<td><strong>Totals:</strong></td>
<td>34</td>
</tr>
<tr>
<td><strong>Precipitating Factors</strong>&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>7. Perceived function of NSSI</td>
<td>3</td>
</tr>
<tr>
<td>8. Triggers/antecedents of NSSI</td>
<td>16</td>
</tr>
<tr>
<td><strong>Totals:</strong></td>
<td>19</td>
</tr>
<tr>
<td><strong>General NSSI Behaviors</strong>&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>9. Description of NSSI behavior</td>
<td>14</td>
</tr>
<tr>
<td><strong>Consequences and Concealment Issues</strong>&lt;sup&gt;d&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>10. Consequences of NSSI</td>
<td>6</td>
</tr>
<tr>
<td>11. Concealment issues</td>
<td>6</td>
</tr>
<tr>
<td><strong>Totals:</strong></td>
<td>12</td>
</tr>
</tbody>
</table>
Table 6 (continued)

<table>
<thead>
<tr>
<th>Major themes</th>
<th>#1</th>
<th>#2</th>
<th>#3</th>
<th>#4</th>
<th>#5</th>
<th>#6</th>
<th>#7</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comorbidity and Treatment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Comorbid psychiatric conditions</td>
<td>5</td>
<td>9</td>
<td>13</td>
<td>8</td>
<td>5</td>
<td>10</td>
<td>18</td>
<td>68</td>
</tr>
<tr>
<td>13. Psychological/medical treatment</td>
<td>0</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>9</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>Totals:</td>
<td>5</td>
<td>14</td>
<td>15</td>
<td>12</td>
<td>8</td>
<td>19</td>
<td>19</td>
<td>92</td>
</tr>
<tr>
<td>Total themes coded per interview:</td>
<td>84</td>
<td>100</td>
<td>178</td>
<td>100</td>
<td>97</td>
<td>85</td>
<td>124</td>
<td>768</td>
</tr>
<tr>
<td>Total unique themes* per interview:</td>
<td>48</td>
<td>61</td>
<td>77</td>
<td>62</td>
<td>67</td>
<td>56</td>
<td>60</td>
<td>431</td>
</tr>
</tbody>
</table>

* Unique themes are defined as the number of themes that occur at least once in each interview.

---

*a-c Theory-driven broad categories into which major themes are organized.
Table 7

Data-derived Major Themes and Subthemes with Number of Participants Coded for Each Subtheme and Total Counts per Subtheme

<table>
<thead>
<tr>
<th>Major themes</th>
<th>Subthemes within major themes</th>
<th>n participants</th>
<th>n codes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Predisposing Factors</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Environmental factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Family historical elements:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscellaneous family conflict/struggles</td>
<td>3</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Family mental illness</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Family substance abuse</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Parental divorce</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Individual historical elements:</strong></td>
<td></td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Major stressor (e.g., significant loss)</td>
<td>2</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Bullying</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Sexual trauma</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Invalidated by caregiver(s)</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Current environmental elements:</strong></td>
<td></td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Work/school stress, relational conflict</td>
<td>4</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>2. Sociocultural influences on NSSI</td>
<td></td>
<td>7</td>
<td>72</td>
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<tr>
<td><strong>NSSI among others:</strong></td>
<td></td>
<td>7</td>
<td>41</td>
</tr>
<tr>
<td>Peer NSSI</td>
<td>7</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Family NSSI</td>
<td>4</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Pro-NSSI subcultures (e.g. Emo)</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Suicidal behavior among peers/family</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Exchanged methods with others</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Exposure to NSSI:</strong></td>
<td></td>
<td>7</td>
<td>31</td>
</tr>
<tr>
<td>NSSI in media, pop culture</td>
<td>7</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>NSSI online content, social media</td>
<td>6</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Non-NSSI online content (suicide, EDs)</td>
<td>4</td>
<td>4</td>
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<tr>
<td>Discovered NSSI independently</td>
<td>1</td>
<td>1</td>
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</table>
### Table 7 (continued)

3. Emotion regulation skills

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<thead>
<tr>
<th></th>
<th>7</th>
<th>52</th>
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<tbody>
<tr>
<td><strong>Ability to effectively regulate emotions:</strong></td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Can deal with problems logically</td>
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<td>5</td>
</tr>
<tr>
<td><strong>Deficits in emotion regulation:</strong></td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>Difficulty with emotion regulation</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td>Low capacity to tolerate distress</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Emotional experience:</strong></td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Easily overwhelmed by emotions</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Extreme emotions on both ends</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Differences in emotion regulation:</strong></td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>Discrepancy between others and self</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Variable depending on the situation</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Handle a lot but become overwhelmed</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Effect on cognition:</strong></td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Hard to stop ruminating</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Tendency to catastrophize</td>
<td>1</td>
<td>2</td>
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</tbody>
</table>

4. General coping strategies

<table>
<thead>
<tr>
<th></th>
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<th>80</th>
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</thead>
<tbody>
<tr>
<td><strong>Emotion-focused (adaptive) coping:</strong></td>
<td>7</td>
<td>24</td>
</tr>
<tr>
<td>Distraction</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Pleasant activity/hobby</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Seek social support, socialization</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Self-care, self-soothing, relaxation</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Buy something new</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Change emotions with book/song</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Problem-focused (engagement) coping:</strong></td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Problem-solving</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Using positive coping statements</td>
<td>2</td>
<td>4</td>
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</tbody>
</table>
Table 7 (continued)

<table>
<thead>
<tr>
<th>Maladaptive (disengagement) coping:</th>
<th>7</th>
<th>43</th>
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</thead>
<tbody>
<tr>
<td>Situational avoidance</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>Experiential avoidance</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Cognitive control strategies</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Social withdrawal/isolation</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Safety behaviors (e.g., companion)</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Substance use</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Emotional/stress eating</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Avoid the problem</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Force a smile</td>
<td>1</td>
<td>1</td>
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</table>

5. Perceptions of self

<table>
<thead>
<tr>
<th>Negative perceptions of self:</th>
<th>7</th>
<th>29</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-criticism</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Deserving to be punished (in general)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Self-judgments about NSSI</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poor self-concept:</th>
<th>6</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low self-worth</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Appearance concerns</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Upward comparisons to others</td>
<td>1</td>
<td>2</td>
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</tbody>
</table>

6. Attitudes about NSSI

<table>
<thead>
<tr>
<th>Positive or mixed attitudes about NSSI:</th>
<th>5</th>
<th>6</th>
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</thead>
<tbody>
<tr>
<td>Conflicting feelings about NSSI</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Rationalizing NSSI (not hurting others)</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Negative attitudes about NSSI:</th>
<th>7</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addictive aspects of NSSI</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>NSSI does not fix problem, is ineffective</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>NSSI is bad, not right way to cope</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Embarrassment about self-harming</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Don’t want others to have to take care of me</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Wanting to stop engaging in NSNI</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Not wanting others to engage in NSSI</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Feeling alone regarding NSSI</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Table 7 (continued)

<table>
<thead>
<tr>
<th>Views of others who engage in NSSI:</th>
<th>7</th>
<th>10</th>
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</thead>
<tbody>
<tr>
<td>Judgments about others who self-harm</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Compassion for others who self-harm</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Positive effects from NSSI online content</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Something interesting to do</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Felt therapeutic</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NSSI online content harmful</th>
<th>7</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influences/encourages/glorifies</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Triggering, make worse, harmful</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Learned new techniques</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Doesn’t offer solutions</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Positive views of NSSI in media/pop culture:</th>
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</thead>
<tbody>
<tr>
<td>Solutions are offered</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Can relate to it</td>
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<table>
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<tr>
<th>NSSI misrepresented in media/pop culture:</th>
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<th>5</th>
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<tbody>
<tr>
<td>Misportrayed, demonized</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Not taken seriously</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Overdramatized/romanticized</td>
<td>1</td>
<td>1</td>
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</table>

Precipitating Factors

7. Perceived function of NSSI | 7   | 45  |

Intrapersonal (internal) functions: | 7   | 38  |
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Emotion/affect regulation</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Self-punishment</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Feel something</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Regain/maintain control</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Prefer physical pain over emotions</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Fix something</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Distraction/stop rumination</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Curiosity/experimental</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Have a reason to be crying</td>
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Table 7 (continued)

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<thead>
<tr>
<th>Interpersonal (social/relational) functions:</th>
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<th>7</th>
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<tbody>
<tr>
<td>Avoid hurting/bothering others</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Escape stressful social situation</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Resolve a conflict</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Receive comfort/cry for help</td>
<td>1</td>
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8. Triggers/antecedents of NSSI

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<tr>
<th>Internal triggers – negative mood states:</th>
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<th>36</th>
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<tbody>
<tr>
<td>Anxiety, worry, panic</td>
<td>5</td>
<td>11</td>
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<tr>
<td>Feeling overwhelmed/out of control</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Sadness, depressed mood</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Aggression, anger</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Numbness or apathy</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Boredom</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Feelings I do not understand</td>
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<td>1</td>
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</table>

<table>
<thead>
<tr>
<th>Internal triggers – negative cognitions:</th>
<th>6</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>“I am worthless/stupid”</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>“I need to be punished”</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>“I hate myself”</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>“I blame myself”</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>“I am helpless/desperate”</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>“I am a disappointment/useless”</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>“I don’t care what happens to me”</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>“I can’t take it anymore”</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Internal triggers – cognitive processes:</th>
<th>4</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rumination</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Urges for NSSI</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Worry/obsessive thoughts</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>No clear thoughts before NSSI</td>
<td>1</td>
<td>1</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Social/relational triggers:</th>
<th>5</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conflict with or within family</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Perceived rejection</td>
<td>3</td>
<td>5</td>
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<tr>
<td>Stressful social events</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Conflict with peers</td>
<td>1</td>
<td>1</td>
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</tbody>
</table>
Table 7 (continued)

<table>
<thead>
<tr>
<th>Other triggers</th>
<th>6</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>School/work/other stress</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>NSSI online content</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Trauma reminder</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Peer NSSI</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Seeing own scars</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

General NSSI Behaviors<sup>c</sup>

9. Description of NSSI behavior 7 118

<table>
<thead>
<tr>
<th>Techniques/methods of NSSI:</th>
<th>7</th>
<th>68</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punching hitting (self/walls)</td>
<td>5</td>
<td>18</td>
</tr>
<tr>
<td>Cutting</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>Used sharp implement</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Scratching/picking</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Pulling hair</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Extreme cold</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Pinching</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Biting</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Holding breath/trying to stop breathing</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Restricting food (not to lose weight)</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Intentionally spending money unwisely</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Burning skin</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Onset and occurrence of NSSI: 7 21

| Age of onset of NSSI             | 7   | 10 |
| Frequency of NSSI behavior       | 6   | 11 |

Typical episode of NSSI: 7 29

<p>| NSSI was impulsive/unconscious  | 5   | 10 |
| Location where NSSI occurred    | 5   | 5  |
| Individual was crying           | 4   | 4  |
| Individual was alone            | 3   | 3  |
| NSSI was pre-planned/thought out| 3   | 3  |
| Applied bandage/cared for wound after | 2 | 3  |
| NSSI performed in front of others | 1 | 1  |</p>
<table>
<thead>
<tr>
<th>Consequences and Concealment Issues</th>
<th></th>
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<tbody>
<tr>
<td>10. Consequences of NSSI</td>
<td>7</td>
<td>61</td>
</tr>
<tr>
<td><strong>Emotional consequences after NSSI:</strong></td>
<td>7</td>
<td>22</td>
</tr>
<tr>
<td>Relief/release</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td>Negative mood after</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Improved mood/feel better after</td>
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<td>1</td>
</tr>
<tr>
<td><strong>Cognitive consequences after NSSI:</strong></td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>Hard on self for engaging in NSSI</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Negative thoughts less intense</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>NSSI did not work, it was not enough</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Thoughts about being proud/pleased</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Few thoughts after NSSI</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Behavioral consequences after NSSI:</strong></td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Going to sleep (exhaustion)</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Go back to previous task/activity</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Social/relational consequences after NSSI:</strong></td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>Others respond negatively</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Others notice NSSI</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Receive support from others</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Physical sensations after NSSI:</strong></td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Physical pain after NSSI</td>
<td>3</td>
<td>6</td>
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<tr>
<td>11. Concealment issues</td>
<td>6</td>
<td>39</td>
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<tr>
<td><strong>Keeping NSSI a secret:</strong></td>
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<td>23</td>
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<tr>
<td>Efforts to avoid telling others</td>
<td>4</td>
<td>5</td>
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<tr>
<td>Few people know</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Uneasiness/reluctance to discuss NSSI</td>
<td>2</td>
<td>5</td>
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<tr>
<td>Not wanting to worry others</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Others inform teachers/parents</td>
<td>2</td>
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<tr>
<td>Others find out without being told</td>
<td>1</td>
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</table>
Table 7 (continued)

| Private nature of NSSI to conceal behavior: | 3 | 16 |
| Efforts to avoid leaving marks/evidence | 2 | 14 |
| Privacy/seclusion when self-harming | 1 | 2 |

**Comorbidity and Treatment**

12. Comorbid psychiatric conditions  

<table>
<thead>
<tr>
<th>Psychological disorders:</th>
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</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>7</td>
<td>44</td>
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<tr>
<td>Mood disorder (including bipolar)</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>Eating disorder</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Personality disorder</td>
<td>1</td>
<td>1</td>
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<tr>
<td>ADHD</td>
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<th>Other problematic behaviors:</th>
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<tr>
<td>Suicidal thoughts and behaviors</td>
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<td>5</td>
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<tr>
<td>Substance abuse</td>
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13. Psychological/medical treatment  

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<th>Psychosocial treatment:</th>
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<td>Outpatient psychotherapy</td>
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<td>7</td>
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<tr>
<td>Positive attitudes about therapy</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Dialectical behavior therapy</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Inpatient psychiatric hospitalization</td>
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<th>Psychiatry/medications:</th>
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<tr>
<td>Prescribed psychotropic medication</td>
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<td>6</td>
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<tr>
<td>Positive attitudes about medication</td>
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<td>4</td>
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<th>Medical treatment:</th>
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<tbody>
<tr>
<td>Received medical treatment for NSSI</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

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\textsuperscript{a-c} Theory-driven broad categories into which major themes are organized.
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*Descriptions of NSSI-related Online Content (Full Study 1 Sample)*
Figure 2

*Descriptions and Effects of NSSI-related Online Content (NSSI Group)*
Figure 3

*Perceptions of People who Self-harm (No NSSI Group)*
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Perceptions of People who Self-harm (NSSI Group)
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Appendix B: Demographic Form

Appendix C: Non-Suicidal Self-Injury Disorder Inventory (NSSI-DI)

Appendix D: Qualitative Interview Questions
Appendix A

*DSM-5 Criteria for NSSI Disorder*

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], excoriatio [skin-picking] disorder).
Appendix B

Demographic Form

Before you begin the study questionnaires, we’d like to ask you some demographic information.

1. How old are you? ____

2. What is your gender? ______________________________

3. In terms of race/ethnicity, how do you self-identify? (Please check all that apply)
   - Asian/Asian American (includes origins from: the Far East, Southeast Asia, or the Indian Subcontinent)
   - Black/African American
   - Native Hawaiian/Pacific Islander (includes origins from: Hawaii, Guam, Samoa, or other Pacific Islands)
   - White/Caucasian (includes origins from: Europe, the Middle East, or North Africa)
   - Hispanic/Latino(a) (includes origins from: Cuba, Mexico, Puerto Rico, South/Central America, other Spanish culture)
   - Mixed race/ethnicity
   - Other race/ethnicity Please indicate: ______________________________
   - Decline to state

4. Do you identify with a particular religion/spirituality? YES / NO
   If yes, which one(s)? ______________________________

5. Please indicate how much you agree with the following statement: (circle one response)
   I get the emotional help and support I need from my family.
   Agree Completely / Somewhat Agree / Neutral / Somewhat Disagree / Disagree Completely

6. Please indicate how much you agree with the following statement: (circle one response)
   I get the emotional help and support I need from my social network (friends, acquaintances, etc.).
   Agree Completely / Somewhat Agree / Neutral / Somewhat Disagree / Disagree Completely
Appendix C

NSSI-DI

1. Have you ever purposely injured yourself without suicidal intent?

For example, cutting, scraping, hitting, or burning yourself on purpose, but without intending to die as a result of the self-harm (i.e., not a suicide attempt)?

☐ YES  ☐ NO

If your response to Question #1 above is NO, please skip to Question #14.
If your response to Question #1 above is YES, please continue with Question #2 below.

2. Which of the following methods have you used when you have engaged in self-harm?

Check all that apply:
☐ cut or carved skin
☐ scraped or scratched your skin
☐ hit yourself on purpose
☐ picked at a wound to intentionally prevent healing
☐ burned your skin (e.g., with a cigarette, match, or other hot object)
☐ inserted objects under your nails or skin (e.g., safety pin, needle, or other sharp object)
☐ rubbed your skin to the point of drawing blood (e.g., with an eraser)

3. How old were you when you first engaged in self-harm? ______

4. In your lifetime, about how many times have you engaged in self-harm? (Check one box)

☐ once ☐ 6-10 times ☐ 51-100 times
☐ 2-3 times ☐ 11-20 times ☐ more than 100 times
☐ 4-5 times ☐ 21-50 times

5. In the past year, on how many days did you engage in self-harm? (Check one box)

☐ not at all ☐ 11-15 days (once/month) ☐ nearly everyday
☐ 1 day ☐ 16-25 days (twice/month) ☐ daily
☐ 2 days ☐ 26-50 days (once/week)
☐ 5-10 days ☐ 51-100 days (twice/week)

6. In the past month, on how many days did you engage in self-harm? (Check one box)

☐ not at all ☐ 11-15 days ☐ 5-10 days
☐ 1 day ☐ nearly everyday
☐ 2 days ☐ daily
7. In the **past week**, on how many days did you engage in self-harm? (Check one box)

☐ not at all     ☐ nearly everyday
☐ 1 day         ☐ daily
☐ 2 days

8. When was the **last time** you engaged in self-harm? (Check one box)

☐ today         ☐ 1 month ago       ☐ 5 years ago
☐ yesterday     ☐ 6 months ago      ☐ more than 5 years ago
☐ 1 week ago    ☐ 1 year ago
☐ 2 weeks ago   ☐ 2 years ago

9. Did you **ever** engage in self-harm for any of the following reasons?

You wanted relief from *negative feelings or thoughts.* ☐ YES ☐ NO
You wanted relief from *interpersonal problems.* ☐ YES ☐ NO
You thought that it would *make you feel better.* ☐ YES ☐ NO

If YES to any of the above in #9, was this in the past year? ☐ YES ☐ NO

10. Immediately prior to engaging in a self-injurious act, did you **ever** experience *negative feelings or thoughts* (such as depression, anxiety, tension, anger, generalized distress, or self-criticism)?

☐ YES ☐ NO  If YES, was this in the past year? ☐ YES ☐ NO

11. Prior to engaging in a self-injurious act, did you **ever** feel *preoccupied with thoughts* about self-harm?

☐ YES ☐ NO  If YES, was this in the past year? ☐ YES ☐ NO

12. In the **past year**, have you *often had urges* to engage in self-harm?

☐ YES ☐ NO

13. Has your self-harm **ever** caused you *significant distress or concern*?

☐ YES ☐ NO  If YES, was this in the past year? ☐ YES ☐ NO

14. Has your self-harm **ever** interfered with your *interpersonal relationships, your schoolwork,* or your *functioning at work* or with *other obligations*?

☐ YES ☐ NO  If YES, was this in the past year? ☐ YES ☐ NO

15. Have you ever received treatment for self-harm?

☐ YES ☐ NO
SKIP TO HERE if you responded NO to Question #1.

16. Have you ever searched online for information about self-harm?

☐ YES  ☐ NO

If YES to #16, what kind of information have you searched for?

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

17. Have you ever visited any websites that have self-harm as the primary subject?

☐ YES  ☐ NO

If YES to #17, how would you describe the overall content of the website(s)?

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

If YES to #17, how did you feel after you viewed online content related to self-harm?

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

18. Do you personally know anyone (other than yourself) who has engaged in self-harm?

☐ YES  ☐ NO

19. How would you describe your perceptions or attitudes about individuals (including yourself, if applicable) who have engaged in self-harm?

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________
Appendix D
Qualitative Interview Questions

General Coping

1. What do you tend to do when you are distressed or upset about something?

2. Have you ever done anything to try to change how you feel when you are distressed or upset? [If yes, ask #3].

3. What kinds of things have you done when you were trying to make yourself feel better?

Non-Suicidal Self-Injury

1. Do you remember how you were first exposed to the idea of self-harm [use client’s own words to describe NSSI]? Did you hear about self-harm somehow or learn it from someone, or did you discover it on your own? (If yes: Can you tell me more about that?)

2. Have you ever searched about self-harm on the Internet or visited websites about self-harm? (If yes: Can you tell me more about that?)

3. Can you recall seeing self-harm depicted in any TV shows, movies, books, articles, or any other form of media? (If yes: How do you think self-harm is portrayed in the media/pop culture?)

4. Do you know other people that have personally engaged in some form of self-harm?

5. Have you ever told anyone about your self-harm or has anyone found out another way?

6. Thinking about times when you have self-injured, do you have any sense of why you might have engaged in the behavior? (Was there a particular goal in mind?)

7. Are there certain kinds of things that tend to bring about urges to self-injure? (Certain kind of events, particular moods or feelings/emotions, specific triggers?)

8. Do you feel that you cope with negative emotions as well as everyone else? Do you think that some things are particularly difficult for you? (Like what?) What is your capacity to tolerate distress? How confident are you in your ability to regulate your emotions?

9. Do you ever experience unmanageable anxiety, panic, or worry? (How often?) Do you ever avoid things (situations, events, people, places) because of your anxiety?

10. Right before you have self-injured, what kinds of thoughts do you tend to have? Can you walk me through a typical scenario when you have self-injured? How do you feel after? What kinds of thoughts do you have after?