Non-Suicidal Self-Injury, Anxiety, and Self-Esteem among Undergraduate College Students

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This dissertation titled
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Abstract

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Research with respect to non-suicidal self-injury (NSSI) epidemiology suggests that NSSI is increasing among adolescents and college students. Moreover, there were mixed findings in research exploring relationships between NSSI and self-esteem, anxiety, and biological sex. While the characteristics of being female, having low self-esteem, and symptoms of anxiety were positively associated with NSSI engagement in many studies, it is necessary to further assess these features gathering in-depth information to clarify these relationships amongst college students. Taken together, the purpose of the study was to explore the prevalence of NSSI and perceptions of NSSI functions among undergraduate college students before and after they commenced college. Additionally, the study aimed to investigate predictive relationships between self-esteem, state anxiety, trait anxiety, and biological sex in relation to lifetime NSSI occurrence and current NSSI occurrence. The interpersonal and intrapersonal NSSI functions were explored.

Participants completed several instruments assessing NSSI behaviors and functions, as well as anxiety and self-esteem. It was found that NSSI engagement was higher before commencing college that was consistent with previous research. The results indicated participants who reported engaging in NSSI reported having higher numbers of friends or acquaintances who engage in NSSI before they commenced college. Findings
further lend support that higher scores in trait anxiety increase the odds of current NSSI occurrence while higher self-esteem scores decrease the chances of lifetime NSSI occurrence. According to study results, lifetime NSSI and current NSSI were highly related with each other. Additionally, self-esteem was negatively associated with trait and state anxiety. Concerning NSSI functions, affect regulation was the leading reason to engage in NSSI followed by self-punishment and anti-dissociation. According to the study results, it was found that intrapersonal functions were preferred by NSSI and nonNSSI group.

This study added to the existing body of knowledge by investigating perceptions regarding NSSI behaviors of other individuals other than self. Clinical and theoretical implications were discussed. Additionally, limitations of current study as well as future directions were presented
Dedication

To my first teachers in life, my mother and my father
Acknowledgment

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Chapter 1: Introduction

Background of Study

Human behavior is infinitely complex. There is no single description that could explain specific human behaviors, such as self-harm. For example, there are no easy answers to questions such as: Why do people want to hurt themselves? What motivates them to engage in actions that self-inflict pain? What are their intentions? And, if the motivation is not to die, then why would individuals engage in such actions? These are challenging questions that demand intricate and nuanced explanations.

Self-injurious behaviors are not a recent phenomenon. The earliest self-mutilation acts have been documented in ancient Greek, Roman, and Japanese texts (Favazza, 2009). According to Favazza, self-mutilative behaviors occurred in religious practices in ancient religions, and such behavior continues in the present time. Favazza’s (1987, 1998) book *Bodies Under Siege: Self-mutilation and Body Modification in Culture and Psychiatry*, serves as an exhaustive guide (Nixon & Heath, 2009) on the cultural functions and manifestations of self-mutilation. Thus, it is assumed that self-injury (SI) is not a new phenomenon, but its incidence has increased gradually over the time (Nock, 2009a). Self-injury (SI) was seen as a form of self-mutilation (SM) at the earliest writing of Karl Menninger’s book, named *Man Against Himself* (Yates, 2004). Interest in understanding the motivation of SI, effective assessment tools, and treatment approaches increased when Mansell Pattison attempted to explain self-mutilation (Favazza, 2009a). Even though Favazza used the term SM, the author later indicated that SI is a politically correct term (Favazza, 2006).
Self-mutilative behaviors were put into two distinct categories by Favazza (1989a): those that are culturally approved and those that are deviant. Culturally approved self-mutilative behaviors might exist in tribes to demonstrate courage and masculinity by sacrificing parts of the body or having scarification due to the perception of beautification (Favazza, 1989a). Alternatively, deviant self-mutilation behaviors are the products of a mental disorder (Favazza, 1989a). To be able to make the distinction as to whether or not the behavior is deviant, a mental health professional needs to review four conditions: if SI is considered a form of beautification, if the individual feels high during the act, if compulsivity is involved, and if the act is interfering with daily functioning (White, Trepal-Wollenzier, & Nolan, 2002).

It can be asserted that SI needs to be evaluated from a cultural lens because someone out of a specific culture might not be able to comprehend the reasons of the behaviors. Walsh (2012) said “In 1980’s, when I showed slides of elaborate tattoos and body piercings to professional audience…80-90% said yes, it is a form of SI. In the decade 2000-2010, when I showed similar audience the very same slides, the yes response dropped to 5-10%” (p. 54). It is obvious from the drop rate that in modern life piercing one’s body or tattooing are acceptable forms of self-injury in many cultures. Hence, it can be said that there are no common qualities cut across cultures since some cultures use SI in their religious rituals or daily life.

Even though the action of self-injury can be traced back to early records of human civilization, studies of the phenomenon began in the 1980s; Favazza’s study of SI has garnered greater interest over the last three decades. Since SI is not a new concept and
still under investigation, there is no clear explanation of the definition, etiology, assessment and treatment approaches for SI (Nock, 2009).

**Definition of Non-Suicidal Self-Injury (NSSI).** There are various definitions of SI in literature; as a result it is challenging to make general conclusions based on study results. The very first term that was introduced by Linehan (1983) was parasuicide which included both suicide attempts and non-suicidal behaviors. In time this term was replaced by deliberate self-harm which was proposed by Pattison and Kahan (1983). Nock and Favazza (2009) said that this term did not address the issue to a sufficient depth because it included suicidal behaviors and only addressed the directness of the behaviors; no indication of intent and non-suicidal nature. SM, suggested by Favazza and Rosental (1993), was the common term used among researchers until recently; however, several researchers opposed the use of SM due to permanent bodily consequences of behaviors that are considered mutilations (Klonsky, Muehlenkamp, Lewis, & Walsh, 2011). As a result of these misconceptions between terms, a new term NSSI was proposed (Nock & Favazza, 2009). The most recent proposal was made by Shaffer and Jacobson (2009). According to these authors, suicide attempts need to be separated from the terms due to confusion among helping professionals and difficulty comparing research results. Moreover, Shaffer and Jacobson noted that helping profession was in need of term that was free of suicide connotations. In lieu of a unified definitional term, for the purpose of this study, non-suicidal self-injury (NSSI) will be used even if previous research had used differing terminology. NSSI has been defined by the International Society for the Study of Self-Injury (ISSS) in 2007 as “the deliberate, self-inflicted destruction of body tissue without suicidal intent and for purposes not socially sanctioned.” (ISSS, n.d, para. 1).
According to the definition of NSSI, NSSI inflicts direct damage to one’s body, and differs from indirect damage such as that caused by substance abuse. NSSI is deliberate, and its incidence is not accidental. NSSI does not include an intent to die which means it is neither suicidal nor is life-threatening. Moreover, it is not accepted by the society in which it is performed.

Muehlenkamp and Kerr (2010) argued that the separation between NSSI and suicide is difficult. They further emphasized that NSSI is not a failed suicide attempt; instead it is a coping mechanism for individuals to deal with negative life events and emotions. To be able to clearly distinguish suicide from NSSI, the differences between two terms need further exploration. Muehlenkamp and Kerr (2010) indicated four criteria: intent, severity, frequency, and used methods. NSSI differs from suicide in term of purpose. The intent for individuals who engage in NSSI is to navigate emotional states. On the other hand, individuals who attempt suicide intend to end their lives. Walsh (2012) also said that “[NSSI] is performed to communicate psychological distress” (p. 5). Another difference depends on severity of the incidents. NSSI is considered low-lethality in comparison to suicide. The frequency of occurrence between NSSI and suicide is also different (Muehlenkamp & Kerr, 2010). Most of the time the frequency of NSSI is higher than suicide attempts. NSSI and suicide vary based on methods as well. Generally speaking, NSSI engagement tends to have various methods than suicide. Furthermore, individuals who engage in NSSI to control their emotional states; in fact, individuals who attempt suicide do so to end these emotional states. Suyemoto (1998) also said that NSSI is a more controlled action than suicide.
**Classification of NSSI.** Following the definition and differences between NSSI and suicide, researchers attempted to further classify subtypes of NSSI (Menninger, 1935; Pattison & Kahan, 1983; Ross & McKay, 1979; Winchel & Stanley, 1991). Favazza and Rosenthal (1993) expanded Favazza’s (1989a) categorization. It was then further nuanced by Favazza and Simeon (1995), and the final classification model was created. According to this typology, there are four distinct subtypes: major, stereotypic, compulsive, and impulsive. Major NSSI includes extreme and rare behaviors such as eye removal. Stereotypic NSSI is associated with mental disability such as head-banging and is typically rhythmic. Compulsive NSSI refers to ritualistic behaviors such as nail-biting. Impulsive NSSI can be episodic and repetitive. These behaviors can be addictive and used to relieve negative emotions such as cutting and burning. Yates (2004) speculated that the final classification model was the widely accepted one and utilized the research.

Until the end of the 90’s, NSSI was studied solely in clinical samples; however, this trend changed when researchers reported increasing numbers of NSSI engagement among nonclinical samples, including adolescents and college students (Walsh, 2012). Nock (2010) indicated that on the basis of reports from teachers, clinicians, and other helping professionals, the numbers of self-injury incidents is growing. Moreover, the Center for Disease Control (2008) stated that there is an increasing trend as in regards to self-injury engagement. Walsh (2012) reported that “…the rate of self-injury grew by 250% over a 15-year period” (p. 37). The authors further speculated that the incremental increase is due to several factors: environmental factors, psychological imbalances, prevalence in the media, and peer influence. Nixon and Heath (2009) indicated that the numbers of incidents for NSSI has been increasing especially among adolescents.
However, most of the research concerning NSSI is descriptive in the sense that researchers have only examined occurrence rates, definitions, biological sex differences, etc.

**Common methods of NSSI.** Among clinical and nonclinical populations in the US, cutting was most often utilized as a method of NSSI (Cawood & Huprich, 2011; Glenn & Klonsky, 2010, 2011; Gratz, 2001; Gratz, Conrad, & Roemer, 2002; Gratz & Chapman, 2007; Klonsky, 2011; Turner, Chapman, & Layden, 2012; Victor, Glenn, Klonsky, 2012; Weinberg, Klonsky, 2012), and similar findings were found in other countries (Heath et al., 2008; Laye-Gindhu, Schonert-Reichl, 2005; Nixon, Cloutier, Jansson, 2008). In addition, some studies found head banging (Glenn, Klonsky, 2009; Klonsky, Olino, 2008), scratching (Hasking et al., 2008; Whitlock, Eckenrode Silverman, 2006), picking skin (Aizenman, Jensen, 2007), preventing wound from healing (Gollust, Eisenberg, Golberstein, 2008), punching self (Serras, Saules, Cranford, Eisenberg, 2010), sticking an object (Lundh, Karim, Quilisch, 2007), were the most engaged methods for NSSI.

**Prevalence of NSSI.** Klonsky et al. (2011) speculated that even though there are several studies that have provided various occurrence rates for different populations, these rates are questionable due to lack of unified terminology used to assess NSSI. Some have shown NSSI rates for college students at approximately 16%, on average (Cawood & Huprich, 2011; Gratz & Chapman, 2007; Nixon, Cloutier, & Jansson, 2008), while almost a quarter of adolescents reported engaging in NSSI (Hilt, Cha, & Nolen-Hoelsema, 2008a; Hilt, Nock, Lloyd-Richarson, & Prinstein, 2008b; Laye-Gindhu & Schonert-Reichl, 2005; Lundh, Karim, & Quilisch, 2007; Muehlenkamp & Gutierrez,
Moreover, there are inconsistencies in the time frame of engagement of an individual in NSSI across studies. Some studies aimed at finding the lifetime prevalence of NSSI; on the other hand some studies investigated the most recent acts (i.e., the last 4 to 12 months).

**Biological sex and NSSI.** There is less consistency among research results regarding how NSSI differs in terms of demographic correlates (i.e. biological sex and sexual orientation). Several studies indicated that there was a difference between males and females with respect to NSSI engagement; some studies showed females are more prone to NSSI than males (Gollust, Eisenberg, & Golberstein, 2008; Hoff & Muehlenkamp, 2009; Wilcox, Arria, Calderia, Vincent, Pinchevsky, & O’Gardy, 2012). The findings with respect to high rates of NSSI among females were attributed to the fact that females are more prone to deal with negative emotions inwardly (Gratz & Chapman, 2009). Conversely, some studies indicated that NSSI effects both males and females (Aizenman & Jensen, 2007; Bjarehed, Wangby-Lundh, & Lundh, 2012; Gratz, 2001; Gratz, Conrad & Roemer, 2002; Gleen & Klonsky, 2010b; Hasking, Monemi, Swannell, & Chia, 2008; Klonsky, 2011; Whitlock, Eckenrode, & Silverman, 2006). The only difference found between biological sexes was frequency; according to Whitlock et al., (2006) females engage in NSSI more frequently than males.

**Diagnosis of NSSI.** In spite the fact that Pattison and Kahan (1983), Favazza and Rosenthal (1990), and Muehlenkamp (2005) proposed to include NSSI in the Diagnostic and Statistical Manual of Mental Disorders (DSM), to this day there is no official diagnosis category for NSSI (Klonsky et al., 2011). However, the DSM-V associates NSSI with borderline personality disorder (APA, 2013). Moreover, Klonsky et al. suggest
that it is not reasonable to diagnose patients with a personality disorder if the only criteria met is engagement in NSSI, and an individual does not meet any other criteria for BPD diagnosis (Klonsky et al., 2011). This is especially challenging for adolescents, since clients below the ages of eighteen years cannot be diagnosed with personality disorders. Thus, a recent movement to create a distinctive disorder category for NSSI is evidence of the significance of the growing phenomenon. The most recent DSM includes NSSI under its Section 3, which means further research is needed to be able to accept it as a clinical entity. It is further indicated in Section 3 that the proposed criteria of NSSI are not for clinical use. The proposed criteria for someone to be diagnosed with NSSI are:

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 or 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)

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

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 periods 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.

D) The behavior is not socially sanctioned (e.g., body piercing, tattooing, part of religious or cultural ritual) and is not restricted to picking a scab or nail biting.

E) The behavior and its consequences cause clinically significant distress or interference in the interpersonal, academic, or other important areas of functioning.

F) The behavior does not occur exclusively during psychotic episodes, delirium, substance intoxication, or substance withdrawal (APA, 2013, p. 803).

It is obvious that with further research and adequate evidence, a clinical entity for NSSI will be warranted. Even though these criteria cannot be used clinically, professionals may use them to draw different conclusions based on presenting behaviors of their patients. It is also necessary to indicate that professionals may need to be cautious in making definite conclusions in terms of NSSI, because there are several other risk factors that contribute to NSSI.

**Risk factors of NSSI.** There are several risk factors for someone to engage in NSSI. These risk factors are not considered causes of NSSI engagement; instead they are seen as correlations. Walsh (2012) suggested that NSSI can be reviewed from a biopsychosocial standpoint for greater insight; the author argued that biological, psychological, and social reasons contribute to the development of NSSI. However, for the purposes of this dissertation, his model was applied only to the potential risk factors.
The proposed biological risk factors of NSSI include chemical imbalances in the brain and genetic make-up of an individual (Dallam, 1997; Pies & Popli, 1995; Simeon, Stanley, Frances, & Mann, 1992).

Among psychological risk factors, childhood maltreatment was found to be most related to future NSSI engagement. Researchers further detailed these maltreatments as sexual, physical, emotional abuse. The majority of the studies in NSSI literature emphasized the importance of childhood sexual abuse on NSSI engagement, and further suggested significant correlation between these variables (Bergen, Martin, Richardson, Allison, & Roeger, 2003; Gladstone et al., 2004; Glassman et al., 2007; Kaess et al., 2012; Nock & Kessler, 2006; Weirich & Nock, 2008; Yates, Carlson, & Egeland, 2008). Even though aforementioned studies speculated positive correlation between childhood sexual abuse and NSSI, several other studies did not echo similar findings as in regards to this correlation (Klonsky & Moyer, 2008; Rodrigues, 2001; Sawannell et al., 2012).

In addition to childhood sexual abuse, childhood physical abuse was suggested to be a potential risk factor for NSSI in some studies (Gratz et al., 2002; Gratz & Chapman, 2009; Nock & Kessler, 2006; Yates et al., 2008), but not in others (Bornovalova et al., 2011; Glassman et al., 2007; Kaess et al., 2012). With respect to childhood emotional abuse, there are conflicting results in the literature. Glassman et al. (2007) and Yates et al. (2008) study results indicated a significant correlation between childhood emotional abuse and NSSI; on the other hand, Bornovalova et al. (2011) and Goldstein, Flett, Wekerle, and Wall (2009) did not find a relationship between childhood emotional abuse and NSSI engagement.
Klonsky et al. (2011) stated that it is still unclear how childhood abuse leads to deviant behaviors like NSSI. Two researchers proposed reasons why childhood aversive experiences may lead to NSSI engagement: Walsh (2012) said that abuse at early ages might lead individuals to hate their bodies; moreover, Ferrara, Terrinoni, and Williams, (2012) indicated due to these aversive experiences individuals might develop irrational thoughts about self. Hence, they engage in destructive behaviors.

Concerning social risk factors, researchers proposed several possibilities. According to several researchers, dysfunctional family environment, lack of family support, and quality interactions between family members plays a large role in tendency toward NSSI behaviors (Halstead, Pavkov, Hecker, & Seliner, 2012; Klonsky & Glenn, 2009). Moreover, when individuals do not know how to handle social conflict and lack problem-solving abilities in social situations, they engage in NSSI (Klonsky et al., 2011). NSSI is transmitted through sharing personal stories, popular songs, movies, and forums (Purington & Whitlock, 2010). Furthermore, it is proposed that NSSI is ‘contagious’ in that the behavior can be transferred from one individual to another by modeling, peer pressure, and admiration (Muehlenkamp, 2006.)

Overall, there is a substantial body of evidence in the professional literature with respect to NSSI risk factors. One of the challenges, however, is not having enough empirical data, due to misunderstandings among researchers on what constitutes risk factors. Moreover, risk factors are not applicable for all individuals, since some individuals who have had aversive experiences do not engage in NSSI, and vice versa. Klonsky et al. (2011) stated that these risk factors need to be evaluated with consideration for causation because of individual differences and level of susceptibility. It is vital to
know the reasons for engagement in NSSI in order to gather clear understanding for what drives individuals into NSSI behaviors.

**Functions of NSSI.** According to Suyemoto (1998) “One of the most difficult tasks in attempting to understand any pathological behavior is discerning why the particular behavior occurs, at this particular time, to serve this particular function, for this particular patient…” (p. 537). That is why it is important in order to understand NSSI to gather in-depth knowledge of the antecedents of the behavior. Previous research explored the potential functions of NSSI (Klonsky, 2007; Klonsky & Glenn, 2009; Nock & Priensteine, 2004). However, there is a misconception about what constitutes a ‘function’. Klonsky (2007) said that several studies referred to functions simply as reasons; some used temporary associations. Klonsky further defined functions as potential variables that reinforce and motivate NSSI behaviors.

Currently, two separate functional models have been proposed for NSSI functions. According to Nock and Priensteine (2004), there are two overall functions for NSSI: automatic and social. The authors further said that these functions are positively and negatively reinforced. Furthermore, Klonsky and Glenn (2009) proposed interpersonal (ones that are reinforced by others) and intrapersonal (ones that are reinforced personally) functions for NSSI. Even though these authors used different labels and combine sub-functions (i.e. affect regulation, self-punishment) under overall functions, the common understanding was NSSI was motivated either individually or environmentally.

Despite the fact that there are separate functional models, individuals who engage in NSSI reported different motives for the behavior. Among other functions, affect
regulation was the most endorsed function for NSSI engagement (Brown, Comtois, and Linehan, 2002; Klonsky, 2007; Klonsky & Glenn, 2009; Klonsky, 2011; Nock & Prienstei... The researchers indicated that individuals who engage in NSSI might have an activating event to alleviate negative emotions, so they engage in NSSI to reduce these emotions. This proposal was congruent with Leibenfut’s (1987) proposal for stages of NSSI: activating event, emotion alleviation, NSSI attempts, completing NSSI, and assessment. Hence, it is important to determine one’s emotional vulnerability and reactivity in order to provide better services such as healthy coping strategies to reduce negative emotions.

The second endorsed function was found to be self-punishment (Klonsky, 2007, Klonsky & Glenn, 2009; Nixon et al., 2002; Nock & Priestein, 2004). Researchers indicated that the underlying motivation for this function is to direct negative feelings (i.e. anger) and thoughts (i.e. loathing) towards the self (Hoff & Muehlenkamp, 2009; Nock, 2009) in order to gain control and relief. This function was endorsed by both clinical (Nixon et al., 2002; Nock & Priestein, 2004) and nonclinical samples (Laye-Gindhu & Schonert-Reichl, 2005; Scoliers et al., 2009; Turner, Chapman, and Layden, 2012). Furthermore, Walsh (2012) reported that individuals, especially those who had aversive experiences, might not love their body, and in order to canalize this feeling they tended to harm themselves.

Beyond affect regulation and self-punishment, there are several functions that did not have adequate empirical support. Anti-dissociation (depersonalization; Klonsky, 2007; Laye-Gindhu & Schonert-Reichl, 2005; Nock & Priestein, 2004), sensation seeking (Glenn & Klonsky, 2009, 2010; Laye-Gindhu & Schonert-Reichl, 2005; Nixon et
al., 2002), anti-suicide (Laye-Gindhu & Schonert-Reichl, 2005; Nixon et al., 2002), and interpersonal influence (Heath, Schaub, Holly, & Nixon, 2009; Laye-Gindhu & Schonert-Reichl, 2005; Nock & Prinstein, 2004; Scoliers et al., 2009; Turner et al., 2012) are some of other functions can be found in literature. There might be several factors that impacted the lack of attention toward these functions; because psychometric instruments rely on retrospective self-reports, individuals might not recall the motivation at the time of the engagement. Moreover, the wording in the instruments may influence personal interpretation.

Lack of clear explanations and understanding in relation to NSSI functions might make the phenomenon difficult and additionally may complicate the treatment approaches. Gratz and Chapman (2009) indicated that knowing about the potential functions of NSSI might decrease shame and stigma attached to these behaviors for individuals who engage in NSSI. They further said that helping professionals may provide information in respect to the underlying issues for NSSI, so that the individual might have ease of relief. In order for counselors to provide effective treatment options for individuals who engage in NSSI, they need to understand the underlying motivators. Thus, they obtain a better conceptualization for their patients.

**Treatment for NSSI.** NSSI treatment can be challenging due to lack of distinct clinical disorder, and connectedness of BDP. Muehlenkamp (2006) suggested that empirically sound treatment approaches are lacking, based on her literature review. Dialectic behavior therapy (DBT, Linehan et al., 1991), cognitive-behavioral therapy (CBT, Crowe & Buncclark, 2000; Raj, Kumaraiah, & Bhide, 2001), problem-solving therapy (PS, Hawton et al., 1998), manual-assisted CBT (MACBT), which is a
combination of problem-solving and CBT (Evans et al., 1999) exhibited promising results in reducing NSSI engagement. Nock, Teper, and Hollander (2007) said that there is a need for evidence demonstrating the effectiveness of one treatment over another for treating NSSI.

**Self-esteem and NSSI.** Negative experiences during development contribute how individuals perceive themselves, and these experiences impact the overall wellness (Rosenberg, 1979). Rosenberg further said that self-esteem is one of the foundations of self-concept and defined it as “the wish to think well of oneself” (p. 53). According to Rosenberg, self-esteem is one of the motivators for individuals to act on certain behaviors. Previous research reported an association between self-esteem and NSSI engagement. Findings further support the idea that individuals who have low self-esteem had higher chance to engage in NSSI (Aizenman & Jensen, 2007; Cawood & Huprich, 2011; Harrison, 2009; Laye-Gindhu & Schonert-Reichl, 2005; Lundh et al., 2007; Tatnell et al., 2013). According to Levenkron (1998), lack of self-worth might lead directly into NSSI. On the foundation of Rosenberg’s hypotheses that early negative experiences contribute to self-esteem, it might be said that individuals have elevated negative emotions as a result of these experiences. When individuals do not know how to cope with these emotions, they could internalize these emotions, developing deviant behaviors to express these emotions.

Rosenberg (1965) indicated that based on his research, individuals who have low self-esteem tend to have anxiety symptoms. Moreover, Epstein (1972) said that individuals experience anxiety when their perceived self-concept and perceived reality do
not coincide. On the foundation of these authors’ arguments, self-esteem and anxiety are associated with NSSI behaviors.

**Anxiety and NSSI.** Klonsky (2007, 2009) reported that individuals who engage in NSSI are unable to cope with aroused negative emotions such as frustration, anger, anxiety, based upon his extensive literature review. Current research demonstrated that anxiety is a significant motivator for individuals to engage in NSSI because of its direct association with tension reduction (Andover et al., 2005; Glenn & Klonsky, 2009, 2011; Golloust et al., 2008; Hoff & Muehlenkamp, 2009; Klonsky, Oltmanns, & Turkheimer, 2003; Klonsky & Olino, 2008; Ross & Heath, 2002; Weinberg & Klonsky, 2012).

According to these study results, individuals who have history of NSSI also have elevated levels of anxiety. Spielberg (1979) said that “…any affect—anxiety, hostility, guilt, interest—is motivational in nature” (p. 84). The implications for such a relationship are that some feelings are motivated by certain incidents and maintained, due to this motivation. It was further supported by Gratz and Chapman (2009) that individuals who engage in NSSI might do so in order to deal with anxiety symptoms. According to Spielberg (1972), individuals exhibit behavioral and physiological reactions as a result of anxiety. As a result, concrete actions are necessity for individuals who have inward emotions, like anxiety, in order to externalize them. The upshot of his proposal therefore, is that individuals might need an outlet to express their feelings, for which NSSI becomes this outlet.

The sections above provided general information regarding definition, prevalence rate, types, risk factors, and treatment approaches of NSSI. Considering that the current study addresses NSSI among college students, the following section provide necessary
information and related studies with respect to this population as well as other study variables.

**College Students and NSSI**

NSSI is believed to be common during early adolescence. However, Whitlock et al. (2006) indicated that starting NSSI is more prevalent during college time. According to several studies the NSSI prevalent rate for college students was reported from 19% to 30% (Cawood & Huprich, 2011; Glenn & Klonsky, 2009, 2010b; Gratz, 2001; Gratz et al., 2002; Hasking et al., 2008; Serras et al., 2010; Wilcox, et al., 2012). With regard to biological sex and NSSI association there is contradicted results in literature. In some studies it was found that female college student engage in NSSI more often than male college students (Gollust et al., 2008; Hoff & Muehlenkamp, 2009; Wilcox et al., 2012). On the other hand, several studies proved otherwise with respect to biological sex differences and NSSI engagement (Aizenman & Jensen, 2007; Bjärred et al., 2012; Gratz, 2001; Gratz et al., 2002; Glenn & Klonsky, 2010; Hasking et al., 2008; Klonsky, 2011; Whitlock et al., 2006). Concerning NSSI functions it was found that emotion regulation was the most favored function among college students for NSSI (Klonsky & Glenn, 2009; Weinberg & Klonsky, 2012). Combined together, interpersonal function was the leading NSSI function (Klonsky & Glenn, 2009). The association between NSSI and study variables yielded different results. With respect to self-esteem, it was found that college students who reported engaging in NSSI had lower levels of self-esteem (Aizenman et al., 2007; Cawood et al., 2011). Studies exhibited that college students who engaged in NSSI also had higher levels of anxiety (Andover et al., 2005; Glenn &
Klonsky, 2009; Golloust et al., 2008; Hoff & Muehlenkamp, 2009; Klonsky & Olino, 2008; Weinberg & Klonsky, 2012).

Statement of the Problem

Research with respect to NSSI epidemiology suggests that NSSI is increasing among adolescents and college students. Moreover, there were mixed findings in research exploring relationships between NSSI and self-esteem, anxiety, and biological sex. While the characteristics of being female, having low self-esteem, and symptoms of anxiety were positively associated with NSSI engagement in many studies, it is necessary to further assess these features gathering in-depth information to clarify these relationships amongst college students. It is imperative to understand the potential risk factors and functions of NSSI among college students to be able to provide better services.

The purpose of the study is to explore the prevalence of NSSI and perceptions of NSSI functions among undergraduate college students before and after they started college. Additionally, the study aims to investigate predictive relationships between self-esteem, state anxiety, trait anxiety, and biological sex in relation to lifetime NSSI occurrence and current NSSI occurrence. The interpersonal and intrapersonal NSSI functions will be explored. The study will add to previous research by focusing on the perceptions of undergraduate college students who do not engage in NSSI regarding common NSSI functions. Moreover, the study will explore the differences between groups (1) undergraduate college students who engage in NSSI and (2) undergraduate college students who do not engage in NSSI in terms of endorsed NSSI functions.
Research Questions and Hypotheses

Research questions for current study were grouped based on the relevancy. Question one and question two aimed at answering NSSI and known number of friends/acquaintances prevalence before and after commencing to the college. Question three and question four examined the predictive relationship in current and lifetime NSSI occurrence while question five explored associations among study variables. Lastly, question six and question seven looked into NSSI functions.

Current study aimed at answering questions below:

**Question 1:** What is the prevalence of NSSI reported by undergraduate college students about themselves a) before commencing college, b) while in college?

**Question 2:** What is the prevalence of NSSI reported by undergraduate college students about their friends or acquaintances a) before commencing college, b) while in college?

**Question 3:** Do self-esteem, state anxiety, trait anxiety, and biological sex explain the predictive relationship in current NSSI occurrence among undergraduate college students?

**Null Hypothesis:** There will be no significant predictive relationship differences in self-esteem, state anxiety, trait anxiety, and biological sex in explaining current NSSI occurrence among undergraduate college students.

**Question 4:** Do self-esteem, trait anxiety, and biological sex explain predictive relationship in lifetime NSSI occurrence among undergraduate college students?
**Null Hypothesis:** There will be no significant predictive relationship differences in self-esteem, trait anxiety, and biological sex in explaining lifetime NSSI occurrence among undergraduate college students.

**Question 5:** What is the correlation between lifetime NSSI frequency, current NSSI frequency, self-esteem, state anxiety, trait anxiety, interpersonal NSSI functions, and intrapersonal NSSI functions among undergraduate college students who engage in NSSI?

**Question 6:** What are common functions of NSSI endorsed by undergraduate college students who do not engage in NSSI?

**Question 7:** Are there differences between what functions are endorsed by two groups: (1) undergraduate college students who engage in NSSI and (2) undergraduate college students who do not engage in NSSI?

**Null Hypothesis:** There are no significant group differences in terms of what NSSI functions are endorsed by two groups: (1) undergraduate college students who engage in NSSI and (2) undergraduate college students who do not engage in NSSI.

**Significance of the Study**

On the foundation of previous research, higher rates of NSSI engagement were reported among undergraduate college students. Given the higher prevalence rates, it is important to further investigate what contributes to NSSI engagement. Thus, this study aims to add to the literature by investigating potential predictors (i.e. self-esteem, state anxiety, trait anxiety, and biological sex) of lifetime NSSI occurrence and current NSSI occurrence. This study further contributed to the understanding of self-esteem, state
anxiety, trait anxiety, biological sex, and NSSI functions relationship. The study added to the previous research by focusing on the perceptions of undergraduate college students who do not engage in NSSI regarding common NSSI functions along with the group differences with respect to endorsed NSSI functions.

By investigating potential predictors on lifetime NSSI occurrence, there was enough evidence for helping professionals in terms of conceptualizing a treatment plan for this group of individuals. Because of the lack of distinct clinical disorder diagnosis for NSSI, professionals may have difficulty addressing this paramount issue among undergraduate college students. By defining functions of NSSI and their relationship with self-esteem, state anxiety, and trait anxiety, it is hoped that the results of this study aids helping professionals to effectively conceptualize potential interventions for their patients.

Even though the interest as in regard to NSSI functions is growing, there are some shortcomings of these studies, including lack of psychometric instruments, limited examination of psychological correlates, and incomplete choices of NSSI functions. Moreover, to the best knowledge, no study in the literature has investigated the relationship between self-esteem, state anxiety, trait anxiety, and NSSI functions. Thus, this study addressed these gaps by using a valid psychometric instrument with a range of NSSI function and their unique relations to self-esteem, state anxiety, and trait anxiety. Furthermore, this study investigated the perceptions with respect to potential NSSI functions.
Limitations and Delimitations of the Study

Limitations. There are several limitations for this study. First of all, due to nature of the sampling procedure of the study, the results could not be generalized to all college students. Secondly, assessments were based on self-report, so participants’ subjective perceptions were presented. Particularly, some self-report assessment tools were based on retrospective experiences, so recalling prior experiences might have impacted on data. Third, due to lack of randomization of participants, the relationships between the variables studied could not be attributable to the causal links. Finally, it was not possible to include all the mediating/moderating variables on NSSI; for instance childhood maltreatment and emotion dysregulation.

Delimitations. On the basis of previous research, this study included self-esteem, state anxiety, trait anxiety, and biological sex as correlates, and examined the relationship between lifetime NSSI frequency and these aforementioned variables. Other variables that might be relevant to lifetime NSSI frequency such as, socioeconomic status, depression, and BPD were not included.

Definition of Terms

NSSI. NSSI has been defined by the International Society for the Study of Self-Injury (ISSS) in 2007 as “the deliberate, self-inflicted destruction of body tissue without suicidal intent and for purposes not socially sanctioned.” (ISSS, n.d., para. 1).

Lifetime NSSI frequency. The total number of NSSI behaviors one engages in throughout one’s life.

Current NSSI frequency. The total number of NSSI behaviors one engages in after starting to college.
**Lifetime NSSI occurrence.** Presence of NSSI both before and after starting college.

**Current NSSI occurrence.** Presence of NSSI after starting college.

**NSSI functions.** Klonsky (2007) defined NSSI functions as potential variables that reinforce and motivate NSSI behaviors. These functions were further grouped in interpersonal and intrapersonal functions (Klonsky & Glenn, 2009).

**Self-esteem.** Self-esteem is a positive or negative attitude toward a particular object, namely, the self (Rosenberg, 1989, p. 30).

**Anxiety.** Anxiety is an emotion based on the appraisal of threat, an appraisal which entails symbolic, anticipatory, and uncertain elements. (Spielberger, 1972, p. 247)

**State anxiety.** According to Spielberger (1983), “[State anxiety] refers to a palpable reaction or process taking place at a given time and level of intensity.” (p. 9). That means state anxiety is a temporary reaction to a given stimulus, and it can fluctuate over time.

**Trait anxiety.** Spielberger (1983) said that “[Trait anxiety] refers to relatively stable individual differences in anxiety-proneness.” (p. 9). That means trait anxiety is related to personality styles and differences between personalities in terms of anxiety disposition.

**Biological sex.** American Psychological Association (2008) defines biological sex as “…the anatomical, physiological, and genetic characteristics associated with being male or female.” (para. 3).
Summary

This chapter provided information with respect to background literature and the importance of the proposed study to the field of self-injury research. The definitions of terms, along with research questions were presented in order to clarify study questions and aims. Moreover, limitations and delimitations of the study were discussed. The next chapter critically reviewed the related professional literature and research outcomes for NSSI.
Chapter 2: Review of Literature

In this chapter research and professional literature on the definition, historical development, and classification of non-suicidal self-injury (NSSI) was described and critically analyzed. Findings relating NSSI to age of onset, prevalence rate, type, and biological sex were presented. The functions of NSSI and two specific functional models of NSSI was explored. Furthermore, evidence for potential biological, psychological, and social risk factors of NSSI was provided. Among other risk factors the relationship between self-esteem, anxiety, and NSSI was critically explored. Finally, treatment approaches for NSSI was described.

Definition of NSSI

Even though NSSI has a long history, there is no standard definition for it (Prienstein, 2008). Some of the terms used in the literature to describe the similar NSSI behaviors include: parasuicide (Linehan, 1983), deliberate self-harm (Pattison & Kahan, 1983), self-mutilation (Favazza & Rosental, 1993), self-inflicted behaviors (Favaro & Santonastaso, 2002), and non-suicidal self-harm (Laye-Gindhu & Schonert-Reichl, 2005). Using different labels to describe similar behaviors have led to some confusion surrounding NSSI. Although the various terms attempted to describe similar phenomena, each of the terms specified certain unique characteristics. For example, according to the definition of self-mutilation (SM), even when injuries are on the surface of the body, they are considered mutilation due to tissue damage. (Favazza & Rosental, 1993). Nock and Favazza (2009) also indicates that the connotation of SM is negatively perceived. On the other hand, the term deliberate self-harm includes using illegal drugs and irresponsible behaviors as possible avenues of self-harm (Pattison & Kahan, 1983).
In addition to the different definitions of NSSI within professional literature, conceptualizations of NSSI vary among countries as well. Jacobson and Gould (2007) indicated that non-suicidal self-injury (NSSI) is used in the U.S.A. to describe self-injurious (SI) behaviors; on the other hand, deliberate self-harm (DSH) is the commonly used term for SI in the UK. It can be concluded that SI is the general umbrella, and the other phrases are derived from SI based on methods and severity. Thus, there is a need for a universal definition of SI (Prienstein, 2008), as the lack of definitional consensus hampers the consolidation and comparison of research findings on this topic.

Thus, the current study will use NSSI in order to maintain the unity among research. Thus, for the purpose of the current study, the following definition of NSSI will be used: “the deliberate, self-inflicted destruction of body tissue without suicidal intent and for purposes not socially sanctioned.” (ISSS, 2007, n.d., para. 1).

History of NSSI

The diagnostic syndrome comprising NSSI has a long history. Even though NSSI is the most current name for the clinical entity, there are several previous formulations of it in the professional literature. Graff and Mallin (1967), after six months of data collection, concluded that there was evidence of “wrist-cutting syndrome” (p. 38). According to these authors, the wrist-cutters were predominantly single females who had issues of relating to others and were addicted to several substances. A couple of years later, Pao (1969) reported evidence of a similar syndrome which was named “delicate self-cutting.” (p. 195). According to Pao the number of patients who deliberately cut themselves increased over a decade. Patients were distinctly categorized by Pao as coarse or delicate cutters. However, Pao further indicated that this categorization was not
sufficient to make generalization about the overall patient body. The author further indicated that, the two commonalities observed in the case of delicate cutters were psychosis and being alone during the act. According to the research findings, the main reason for cutting was to relieve mounted tension.

Previous research on cutting was expanded by Rosenthal, Rinzler, Wallsh, and Klausner (1972). The main aim of their study was to investigate the non-suicidal cutting phenomenon by comparing female patients who engaged in cutting with a control group of patients who did not demonstrate cutting but had a history of suicide. The authors interviewed the female patients after the cutting incident to determine their emotional states. The results of the study revealed that among patients the common reasons reported for cutting were to feel something and to relieve elevated emotional states. The authors proposed a wrist-cutting syndrome, but they cautioned that their results were open to interpretation and required further research in order to be considered conclusive (Rosenthal, et al., 1972).

Despite the efforts of the researchers discussed above, the proposed syndromes related to cutting failed to garner adequate clinical attention. One reason for this failure might be the exclusive focus on only one NSSI behavior, cutting. Further, samples were restricted to inpatient females. Another short-coming was these authors did not exclude suicide to distinguish NSSI as a separate entity from suicidal ideations and actions.

Over a decade later, Kahan and Pattison (1984) indicated that there was enough data for a clinical self-injury syndrome. The authors proposed a deliberate self-harm (DSH) syndrome, which was based on DSM diagnostic rules, to be included in DSM-IV. They reviewed literature for the past twenty years and based their case on a self-injury
A classification that was proposed by Pattison and Kahan (1983). The main purpose of the proposal was to consider NSSI as a separate diagnostic category rather than as a specific symptom related to other disorders such as borderline personality disorder. Kahan and Pattison aimed to make a distinct definition for the term to be used to describe DSH and clearly differentiated that it was not suicidal in nature. According to these authors, DSH had low lethality, was repetitive in nature, and the person engaging in such behaviors had no intent to die. The authors claimed that DSH was observed across all age groups and personality types, and was present in clients with varied psychotic disorders. Regardless of the clinical support the authors provided, the syndrome was not accepted as a separate diagnosis in the DSM.

A few years later, Favazza and Rosenthal (1990) suggested repetitive self-mutilation syndrome (RSMS) based on previous research and on their own clinical observations. They defined repetitive self-mutilation as lack of resistance to self-harming impulses which were not intended to end one’s life. RSMS was claimed to be associated with personality disorders. Favazza and Rosenthal stated that this syndrome could be coded under Axis I impulse control disorder because it included all the critical features: failure to resist the impulses, elevated emotional state before the act, and a sense of relief after the act. They further stipulated that the diagnosis could be made when individuals repetitively engaged in self-harm behaviors as a result of internal or external stimuli, and that RSMS did not include suicide, and it was not a result of delusion, mental retardation, or hallucination. Furthermore, Favazza and Rosenthal stated that when repetitive SM disappeared, individuals no longer demonstrated all the criteria for personality disorder diagnosis. The authors claimed that if RSMS could be accepted as an Axis I diagnosis,
clinicians could find innovative treatment approaches for clients engaging in RSMS. Even though Favazza and Rosenthal provided evidence for a separate clinical diagnosis, RSMS was not accepted in the DSM.

At the beginning of the new century, another attempt was made for NSSI to be considered as a clinical entity. Muehlenkamp (2005) proposed self-injurious syndrome (SIS) to be included in the DSM-V. Her proposal was established upon clinical evidence and support from the literature. According to her, the conceptual definitional problems and limited studies focusing on clients with borderline personality disorder created challenges for SIS and resulted in it not being seen as a separate diagnosis. Muehlenkamp stated that SIS fulfilled the requirements to be considered as a syndrome and with further research it could be accepted as a mental health disorder. Similar to the views of Favazza and Rosenthal (1990), Muehlenkamp argued that if SIS was accepted as a separate clinical entity, clinicians might have a clearer definition of this client problem, and research on this topic could be expanded. Further, she indicated that clinical definitional unity, effective treatments, and reduced stigmation among individuals engaging in SIS were the potential benefits of adopting SIS as a clinical syndrome. Even though she based her proposal on research findings in the literature, this proposal did not get adequate attention for SIS to be considered as a separate clinical diagnosis.

The most recent proposal was made by Shaffer and Jacobson (2009) who were in the DSM-V revision work group for children and adolescents. According to the authors, self-injurious behaviors needed to be conceptually defined and put in one separate category in order to avoid confusion among clinicians and researchers. They proposed non-suicidal self-injury (NSSI) as a distinct clinical disorder to be included in DSM-V.
Shaffer and Jacobson reported that this proposal aimed to alleviate the lack of clinical diagnosis for NSSI as a separate category in DSM, as well as misconceptions and lack of definitional clarity related to NSSI. Previous attempts for NSSI to be accepted as a separate diagnosis were rejected due to the strong link between SI and borderline personality disorder. However, the authors suggested that there was enough evidence that individuals who engage in NSSI do not always meet the criteria to be diagnosed with BPD. Despite the evidence that NSSI can be considered as a separate disorder, it was not accepted in the newest DSM as a separate disorder.

It is obvious that over four decades researchers tried to distinguish NSSI as a separate clinical entity instead of being a symptom of other clinical disorders. Despite their justified research results and personal efforts, NSSI still was not considered as a separate clinical disorder in DSM-V, instead it was further suggested that extended research is needed in order it to be accepted as a distinct clinical disorder. However, it is under section 3 that underscores the importance of the phenomenon. In this section, proposed diagnostic criteria, diagnostic features, development and course, risk and prognostic factors, and differential diagnosis of NSSI were presented. It was further indicated that these criteria were not aimed for clinical diagnosis (APA, 2013).

Based on these proposals, it can be inferred that there are several benefits of considering NSSI as a separate disorder. First of all, it might generate conceptual commonality among clinicians and researchers. Second, it might create ease of diagnosis for individuals who do not fall any of the DSM disorders. Third, clinicians might have a better understanding on how to treat NSSI instead of treating for BPD (Favazza & Rosenthal, 1990; Muehlenkamp, 2005; Shaffer & Jacobson, 2009).
Typology of NSSI

Throughout the development of defining and categorizing NSSI, researchers have attempted to distinguish the behavior by generating specific classifications. One of the earliest classifications was done by Menninger (1935). Based on this classification there are four distinct categories: neurotic, religious, psychotic, and organic. Neurotic self-mutilation occurs as a result of saving the body from evil and follows the demands of destructive insight. Religious self-mutilation happens during religious rituals. Psychotic self-mutilation is based on self-punishment and sexual drives, and organic self-mutilation is accompanied by mental disorders and physical diseases. This classification for self-mutilation remained in use for approximately four decades until Ross and McKay (1979) proposed a new one that is based on explanatory behavioral incidents.

Ross and McKay proposed two broad categories of NSSI: direct and indirect. The authors further divided direct NSSI into different categories since these behaviors do not resemble each other either behaviorally or functionally. Direct NSSI consisted of: cutting, burning, hitting, self-mutilation. Over eating, drug use, and smoking were some examples of indirect NSSI. According to Ross and McKay, SM is different from other forms of NSSI because the consequences of the behavior are directly related to the behavior; thus SM needs to be under direct NSSI. Pattison and Kahan (1983) added to the idea that the NSSI needs to be assessed based on three factors: directedness, lethality, and repetitiveness. Winchel and Stanley (1991) proposed the idea that NSSI could be categorized based on context and personality disorders. Their classification failed to include mental disorders other than psychosis.
The typology of Favazza and Rosenthal (1990) is the widely used one among other classifications (Yates, 2004). The benefit of this phenomological typology helps with making an accurate diagnosis (Favazza & Rosenthal, 1993). The authors classified NSSI into three categories: major, stereotypic, and superficial. Later Favazza and Simeon (1995) expanded the research and their understanding of the classification by describing four distinct categories: major, stereotypic, compulsive, and impulsive.

Major NSSI is the most dangerous among others since it cannot be reversed, and it results in severe and lasting damage. Usually individuals who engage in major NSSI are diagnosed with schizophrenia. Some examples of major NSSI are amputation and eye removal. Stereotypic NSSI is often accompanied by mental retardation and several other syndromes (i.e. Lecsch- Nyhan, Cornelia de Lange, and Prader- Willi, Favazza & Simeon, 1995). This type is most of the time repetitive and rhythmic, consisting of behaviors such as self-hitting, head banging, and hair pulling, which are driven by biology. Favazza and Rosenthal (1990) indicated that stereotypic type can be explained by biological components such as lack of dopamine or endorphin levels. Compulsive NSSI can be seen several times a day due to their ritualistic nature. Individuals who engage in compulsive NSSI have elevated anxiety prior to the act and relief after. Nail biting and skin picking are some of the common forms of compulsive NSSI. Impulsive NSSI is further divided into two subcategories: episodic and repetitive. Episodic NSSI helps with tension release and emotion control with behaviors such as hitting and cutting. The repetitive version can become addictive over time and individual becomes preoccupied with the act. Favazza and Rosenthal (1993) indicated that repetitive NSSI was caused due to lack of resistance to impulses. Impulsive NSSI is the main focus of
this study because of the fact that it is not related to mental retardation and pervasive development disorders.

**Age of Onset of NSSI**

NSSI is assumed to start in early adolescence (Favazza, 1998; Favazza & Conteiro, 1988), and is rarely expressed before puberty (Yates, 2004).

In a study investigating whether or not being alone or being with others are potential predictors of NSSI, Glenn and Klonsky (2009) found that more than 60% of the participants started engaging in NSSI when they were thirteen. The same result was found in Glenn and Klonsky’s (2010b) study investigating the predictor role of seeing blood on NSSI engagement. In a longitudinal study examining the prospective predictors of NSSI, the authors echoed same result in terms of age of onset (Glenn & Klonsky, 2011). Similarly, in a randomized control-group study, the clinical differences between suicidal and non-suicidal individuals were explored. According to study results, the age of onset for NSSI group was 13.

Aizenman and Jensen (2007) in their study aimed at investigating the differences between individuals who tattooed/pierced and who engaged in NSSI. According to the study results, more than 70% of individuals who engaged in NSSI reported their starting age as 14. Similarly, in their study exploring the suicide risk for NSSI, Muehlekamp and Gutierrez (2007) found that more than quarter of the participants said they started engaging in NSSI at the age of 14. The same findings were echoed in Klonsky’s (2011) study. Klonsky collected data from a randomly selected national sample in order to examine the characteristics and prevalence rate of NSSI. According to study results, the age of onset for NSSI was 14. Correspondingly, in a control-group lab study, Weinberg
and Klonsky (2012) explored the effects of electro shock on tension reduction. The study results revealed that the mean age for participants to start NSSI was fourteen. In a longitudinal study exploring the nature and prevalence of NSSI, Nixon et al, (2008) found that majority of the participants reported their starting age to engage in NSSI at age 15.

Based on research findings, it can be seen that the age of onset of NSSI is between 13 to 15 years of age.

**Prevalence of NSSI**

Due to the lack of a standardized definition, prevalence rates for NSSI cannot be collected in a systematic way. Heath, Ross, Toste, Charlebois, and Nedacheva (2008) indicated that even though previous studies focused on inpatient samples, recent studies have demonstrated that NSSI is becoming widespread in nonclinical samples

In the general population, approximately one in ten people engage in NSSI (Yates, 2004). According to a more recent study, 6% of the developmentally able adults engage in NSSI in the United States (Klonsky, 2011). In comparison to the adult population, the incidence of lifetime NSSI is higher for college students at 16 % (Cawood & Huprich, 2011; Gratz & Chapman, 2007; Nixon et al., 2008). Based on several study results NSSI prevalent rates vary from 19% to 30% (Cawood & Huprich, 2011; Glenn & Klonsky, 2009, 2010b; Gratz, 2001; Gratz et al., 2002; Hasking et al., 2008; Serras et al., 2010; Wilcox, et al., 2012) for college student population. Thirteen percent of college student participants reported that they engaged in NSSI several times (Heath et al., 2008; Lundh et al., 2007; Whitlock et al., 2006).
Because NSSI is assumed to start in early adolescence (Favazza, 1998; Favazza & Conteiro, 1988), the prevalence rate is expected to be highest in early adolescence (Heath et al., 2009). Research findings with nonclinical adolescents revealed that almost a quarter of the participants reported engaging in NSSI (Hilt et al., 2008a; Hilt, et al, 2008b; Laye-Gindhu & Schonert-Reichl, 2005; Lundh et al., 2007; Muehlenkamp & Gutierrez, 2004, 2007; Ross & Heath, 2002). The occurrence of NSSI in clinical adolescent samples is estimated to be more than 40% (Kumar, Pepe, & Steer, 2004).

On the basis of research findings, it is safe to conclude that NSSI is a prevalent act among adults, college students, and adolescents. However, it cannot be said that these rates are the exact estimates due to the reliance on retrospective self-reports. Data collection with instruments that lack robust psychometric properties is another reason to interpret prevalence rates of NSSI with caution. In order to gather accurate data, further research is needed utilizing psychometrically sound instruments.

**Common Methods of Engaging in NSSI**

Among nonclinical populations in the US, cutting was found to be the most endorsed method of NSSI. The highest rate was found in Glenn and Klonsky’s (2011) longitudinal study examined the prospective correlates of NSSI. The authors found that nearly 83% of the participants reported cutting as their primary method of NSSI. In a similar study Glenn and Klonsky (2010a) investigated the relationship between impulsivity and NSSI among college students. Study results revealed that cutting was favored by more than 80% of the participants as an NSSI method. Victor, Glenn and Klonsky (2012) examined whether or not NSSI is addictive, and they found among other methods cutting was endorsed by more than 60% of the participants. In a national study,
Klonsky (2011) found that more than one third of the participants preferred cutting. In their study exploring the relationship between personality traits, self-esteem, and NSSI among college students Cawood and Huprich (2011) found that more than 16% of the participants used cutting as an NSSI engagement method. Gratz (2001) study results discovered that approximately 14% of the participants’ method was cutting. Similarly, fifteen percent of the individuals endorsed cutting in a study exploring potential risk factors of NSSI (Gratz et al., 2002).

Dissimilar findings were found in several studies as in regards to favorable NSSI methods. For example, in their study with college students Glenn and Klonsky (2009) aimed at examining the social context of NSSI. According to study results, the common method was head-banging endorsed by 60% of the participants. Similarly, Klonsky and Olino (2008) reported head banging as a method of NSSI among nonclinical adolescents in a study aimed at finding different sub-groups of NSSI. In another study investigating the demographic characteristics and potential predictors of NSSI among college students, Whitlock et al., (2006) found that scratching was endorsed by more than half of the participants as an NSSI method. On the other hand, another study with the same purpose found preventing wound from healing as a method, endorsed more than one third of the participants (Gollust et al., 2008). On contrary, Serras et al., (2010) found punching self was a favored by more than 30% of the participants as an NSSI method in their study examining the demographic characteristics and prevalent rates among college students. A different study that examined the differences between college students who engage in NSSI and who tattooed/pierced revealed that picking skin was favored by more than sixty percent of the participants (Aizenman & Jensen, 2007).
Similar to nonclinical samples, cutting was the most favorable NSSI method reported among clinical samples in three studies (Turner et al., 2012; Victor et al., 2012; Weinberg & Klonsky, 2012). However one study reported that preventing wounds from healing was the method endorsed by nearly 20% of the participants (Andover, Pepper, Ryabchenko, Orrico, & Gibb, 2005).

Similar findings were found with respect to methods for engaging in NSSI internationally. Among Canadian high school and college students it was found that cutting was the most prevalent method of NSSI (Heath et al., 2008; Laye-Gindhu & Schonert-Reichl, 2005). Similarly, among nonclinical English samples, cutting was found to be the favored method for engaging in NSSI (Nixon et al., 2008). Scratching was endorsed more than half of the participants (Hasking et al., 2008) in a study on English adolescents. In a study conducted in Sweden, sticking an object into the skin was the preferred method of NSSI endorsed by 32% of Swedish adolescents (Lundh et al., 2007).

According to research findings, the common areas of the body for individuals to administer NSSI were the chest, abdomen, and inner side of the forearms and legs (Favazza, 1998; Klonsky & Muehlenkamp 2007; Kumar et al., 2004; Nock & Prinstein 2004; Whitlock et al. 2008). It can be suggested that individuals prefer places that cannot be easily seen by others. The fact that injuries are hidden could indicate individuals feel shame or do not wish for their NSSI to be detected.

Based on the findings of many studies, there is enough evidence in the literature to conclude that cutting is favored by both clinical and nonclinical samples as a method of engagement. It might be because of the easy accessibility of tools to implement cutting. However, some studies only inquired about cutting as an NSSI method which
could have contributed to have higher rates for cutting that were reported. Research also indicated that methods for engaging in NSSI are not mutually exclusive because most people use multiple methods for NSSI (Klonsky & Muehlenkamp, 2007; Laye-Gindhu & Schonert-Reichl, 2005).

**Biological Sex and NSSI**

There is a controversy in literature regarding the prevalence of NSSI between males and females among different populations. In their study with Canadian high school students, Laye-Gindhu and Schonert-Reichl (2005) reported that girls were more likely to engage in NSSI than boys. Similarly, study findings with college student samples revealed that females engaged in NSSI more than males, and being a female was a significant predictor for NSSI engagement (Gollust et al., 2008; Hoff & Muehlenkamp, 2009; Wilcox et al., 2012). Even though these studies indicated high rates among females, it cannot be conclusive due to the nature of sampling mistakes. In these studies, females were overrepresented, so that the results indicated high rates. Furthermore, it can be said that females are more prone to talk about NSSI than males.

Even though studies mentioned above exhibited differences between males and females in relation to NSSI engagement, there were several studies in literature indicating that there were no differences by biological sex in terms of NSSI engagement among college students (Aizenman & Jensen, 2007; Bjärred et al., 2012; Gratz, 2001; Gratz et al., 2002; Gleen & Klonsky, 2010; Hasking et al., 2008; Klonsky, 2011; Whitlock et al., 2006). In a study with adolescents, no differences by biological sex were found for engaging in NSSI (Hilt et al., 2008). It is obvious that the studies revealed contradictory results as in regards to biological sex and NSSI engagement. Based on the divergent
findings of studies it appears that further research on biological sex and prevalence of
NSSI with heterogeneous samples is warranted.

**NSSI Functions**

Several researchers have studied the functions of NSSI. However, it is challenging to categorize these functions into coherent sections, because different authors have utilized different terminology for the same functions. After reviewing the relevant literature, Klonsky (2007) proposed seven common functions for NSSI: (a) affect regulation (to navigate the negative emotional state), (b) anti-dissociation (to feel something even it is pain), (c) anti-suicide (to control urges to attempt suicide), (d) interpersonal-influence (to manipulate others), (e) interpersonal boundaries (to have boundary statement), (f) self-punishment (to express emotions towards self), and (g) sensation-seeking (to create adrenaline to feel excitement, p.229).

According to Klonksy’s findings, affect regulation was the most common function for NSSI. The function of affect regulation is supported in several other studies. Brown et al. (2002) compared patients who were suicidal or self-injuring regarding their primary reasons for engaging in NSSI behaviors. According to the results, the main reasons for self-injurers were to relieve elevated tension and emotions. Similarly, in their study investigating the validity of functional model, Nock and Priensteine (2004) found that among clinical adolescents, affect regulation was endorsed as the highest factor among other functions. The results of these studies were found to be congruent with nonclinical samples.

In a study examining the prevalence rates and functions of NSSI engagement among nonclinical adolescents, Laye-Gindhu and Schonert-Reichl (2005) found that
adolescents who engaged in NSSI had higher levels of emotional distress, and engaged in NSSI behaviors to relieve negative emotions. Klonsky and Glenn (2009) found similar results for affect regulation function for NSSI engagement among college students. According to other study findings, conducted in Europe with adolescents, individuals engage in NSSI for relief from emotional distress and to change the way they feel (Scoliers et al., 2009). Similar findings were echoed in the Klonsky (2011) study with adult participants, where the most endorsed function was found to be affect regulation. In a control-group lab study, Weinberg and Klonsky (2012) hypothesized that NSSI was endorsed due to reduce negative emotions. In order to test study hypothesis, participants were grouped as NSSI injurers and non-NSSI injurers and assessed in terms of their affect. Later they were given electro shock to simulate NSSI and assessed in respect to their emotional states. According to the results, NSSI group had higher reductions on their emotional state than the non-NSSI group.

Even though the findings of these studies were promising to understand the potential factors related to NSSI engagement, the results were based on retrospective experiences. Thus, it can be said that individuals who participated in these studies might not remember the exact reasons for their behaviors or exact feelings associated with the incidents. For this reason further research needs to be conducted in real time.

The second prevalent function of NSSI was speculated to be self-punishment (Klonsky, 2007; Klonsky & Glenn, 2009). This specific function was found to be statistically-significant in a study reviewing three longitudinal study results. Based on this review, self-punishment was the common function (Briere & Gil, 1998). This finding was repeated in clinical samples (Nixon et al., 2002; Nock & Prinstein, 2004). For instance, in
their study investigating the potential reinforcements for NSSI engagement among inpatient adolescents, Nixon et al. (2002) found that more than half of the participants reported self-punishment as their reinforcement. Similar findings were repeated in their study utilizing inpatient adolescents to explore the functional model of NSSI, Nock and Priesten (2004) found that after self-punishment was the second favorable function to engage in NSSI.

Congruent results as in regards to self-punishment were echoed in nonclinical samples (Laye-Gindhu & Schonert-Reichl, 2005; Scoliers et al., 2009; Turner et al., 2012). For example, in their study Laye-Gindhu and Schonert-Reichl (2005) surveyed adolescents to be able to gather data as in regards to prevalent rates and functions of NSS among adolescents. It was found that more than 60% of the participants reported self-hatred as their main reason for engaging in NSSI. Similarly, Scoliers et al. (2009) study findings indicated nearly one third of the adolescents participated in study preferred self-punishment as their primary reason for NSSI engagement. The most recent online study conducted by Turner et al. (2012) investigated the five common functions (i.e. emotion regulation, feeling generation, self-punishment, interpersonal influence, and interpersonal communications) of NSSI among nonclinical female participants. According to the study results, self-punishment was endorsed by more than half of the participants as a NSSI function.

The study findings were promising, in that self-punishment was preferred by both clinical and nonclinical samples regardless of the fact that some studies utilized self-punishment and self-hatred interchangeably. However, to be able to conclude that self-punishment was reinforcement for NSSI engagement, additional research is required.
Despite the fact that affect regulation and self-punishment were the most favorable functions for NSSI engagement, there are several other functions for NSSI engagement. Other functions that had less strong evidence for NSSI were anti-dissociation (i.e. depersonalization; Klonsky, 2007; Laye-Gindhu & Schonert-Reichl, 2005; Nock & Priest, 2004), sensation seeking (i.e. generate excitement; Glenn & Klonsky, 2009, 2010; Laye-Gindhu & Schonert-Reichl, 2005; Nixon et al., 2002), interpersonal influence (i.e. manipulate others; Heath et al., 2009; Laye-Gindhu & Schonert-Reichl, 2005; Nock & Priest, 2004; Scoliers et al., 2009; Turner et al., 2012), and anti-suicide (i.e. avoid suicide attempts; Laye-Gindhu & Schonert-Reichl, 2005; Nixon et al., 2002).

It is revealed in the literature that individuals reported various different functions to engage in NSSI. Among all other functions, affect regulation was the most favorable response for self-injurers. This can be explained by the fact that individuals who engage in NSSI do so to navigate the elevated negative emotions and relief tension those were individually reinforced.

However, it is not the only function that explains the reasons for engagement in NSSI. For example, in his study, Klonsky (2011) found that more than half of the participants who engage in NSSI reported several functions to be able to justify their behavior. It is safe to conclude that participants use several functions to define their reasoning; though, these functions are not mutually exclusive. Even though some functions were more favorable than the others, future studies should investigate the correlational relationships between NSSI functions to be able to gather in-depth information.
Functional models. Despite several studies in literature found various functions for NSSI, none of the authors attempted to look at these functions from a structured perspective. Thus, Nock and Prienstein (2004) suggested that these functions can be assessed in terms of a comprehensive model. Couple of years later, Klonsky and Glenn (2007) echoed a similar model. The researchers examined NSSI functions from different perspectives.

In their functional classification, Nock and Prienstein (2004) did not utilize a syndormal perspective, but rather based their judgments on previous literature. They proposed a 4-way functional model to explain the antecedents and motivations for NSSI. To test their proposal, the authors conducted a study to investigate the reasons for NSSI engagement for clinical adolescents by Functional Assessment of Self-Mutilation (FASM; Lloyd, Keeley, & Hope, 1997) instrument. This instrument was designed to collect data for NSSI behaviors, functions, and clinical diagnoses (Lloyd et al., 1997).

After conducting a factor analysis, the functions in this instrument were endorsed into two factors: automatic and social. The authors speculated that NSSI is motivated by either automatic incidents (by self, i.e. self-punishment), or social incidents (by others, i.e. attention seeking). It was further proposed that automatic and social incidents can be reinforced either positively or negatively. According to the authors, the final model for NSSI functions includes automatic-positive reinforcement (APR), automatic-negative reinforcement (ANR), social-positive reinforcement (SPR), and social-negative reinforcement (SNR). Automatic-negative reinforcement is explained as one’s use of NSSI to reduce tension or negative affect. In contrary, automatic-positive reinforcement is used to create an emotional state. Thus, NSSI is used not only for vanishing an
emotion, but also creating one. On the other hand, social function is utilized to control one’s environment. For instance, social-positive reinforcement helps individuals to gain attention or pity from others around them. Moreover, social-negative reinforcement is based on the understanding that NSSI is used for escape from unpleasant responsibilities.

According to the results, the four-function model was a good fit for explanation even though two-function and three-function demonstrated significant results. The authors further proposed that the constructs were not interrelated to each other; this explains the distinction between the functions. This study was preliminary, so further research needs to be done with different populations to ensure the legitimacy of the Nock and Prinstein model or any similar model.

Nock and Prinstein (2005) wanted to further their previous study by including different contextual factors those were considered to be related to the NSSI engagement such as depression, hopelessness, suicide attempts, perfectionism, loneliness, and PTSD. By doing so the authors aimed at proving the construct validity of their functionality model. The participants were inpatient adolescents. The results revealed that all of these aforementioned factors were positively correlated with four distinct functions. More detailed previous suicide attempts and hopelessness had associations with ANR, depression and PTSD were related to APR, and perfectionism was only associated with social functions.

To be able to gain in-depth information about NSSI function and address the lack of psychometric instrument to assess NSSI function, Klonsky and Glenn developed a one such instrument in 2009. The aim of this instrument was to assess 12 NSSI behaviors (cutting, severe scratching, biting, banging or hitting self, burning, interfering w/ wound
healing, carving, rubbing skin against rough surface, pinching, sticking self w/ needles, pulling hair, swallowing dangerous substances) and 13 common functions (affect regulation, anti-dissociation, self-punishment, anti-suicide, marking stress, self-care, sensation seeking, interpersonal influence, autonomy, interpersonal boundaries, revenge, peer-bounding, and toughness) of NSSI (Klonsky & Glenn, 2009). The behaviors and functions for this instrument were dependent upon previous research and personal consultation with experts in the field. To be able to validate the psychometric properties of the instrument, the authors administered the instrument more than 200 participants. After a factor analysis, the authors concluded that functions have two factor loads: interpersonal and intrapersonal. According to the study, intrapersonal functions were reinforced by self and included affect regulation, anti-dissociation, self-punishment, anti-suicide, and marking stress. This label was consistent with Nock & Prinstein’s (2004) automatic function. Interpersonal functions that were reinforced by others included self-care, sensation seeking, interpersonal influence, autonomy, interpersonal boundaries, revenge, peer-bounding, and toughness. This label was consistent with Nock & Prinstein’s (2004) social function. The study results further revealed that participants demonstrated intrapersonal functions to engage in NSSI more than interpersonal functions.

To be able to test the reliability of the NSSI instrument developed by Klonsky and Glenn (2009), another study was conducted by Glenn and Klonsky (2011). In a one-year long study, the authors examined the psychometric properties of the aforementioned instrument as well as the NSSI functions and behaviors among college students. According to the results, interpersonal functions were endorsed by majority of the
participants in comparison to intrapersonal functions. Similarly, in an unpublished thesis examining the symptomology and functions of NSSI, it was found that intrapersonal functions were more correlated to NSSI than interpersonal functions among college students (Safirr, 2011).

There were not enough studies in literature that categorized all the aforementioned functions related to NSSI in one comprehensive model. For this reason, the models proposed by Nock and Prinstein (2004) and Klonsky and Glenn (2009) had significant contribution to the body of literature. Moreover, even though the authors utilized different terms to describe similar concepts (automatic vs. intrapersonal; social vs. interpersonal), their aim was to create commonality for ease of assessment and to provide in-depth information about NSSI functions.

**Risk Factors**

Although some studies have been conducted on epidemiology and functions of NSSI, there is limited current research in terms of potential pathways to NSSI. Moreover, the results of these studies revealed controversial information. In this section, biological, psychological, and social risk factors as well as self-esteem and anxiety for NSSI engagement will be explored.

**Biological risk factors.** NSSI and biological factors have a complex relation; as a result, empirical research interest has only more recently emerged in this area. Biological perspectives on NSSI asserted that genetic make-up (Simeon, Stanley, Frances, & Mann, 1992) and chemical reactions (Dallam, 1997; Pies & Popli, 1995) have an influence on the behavior engagement.
Despite the fact that some research indicated the relationship between NSSI and chemical reactions in the brain, there is not adequate research on the neuorobiology of NSSI (Osuch & Payne, 2009). NSSI, especially the repetitive type, is assumed to activate the endogenous reward process due to its addictive nature (Dallam, 1997; Pies & Popli, 1995). It is suggested that feeling of euphoria, due to elevated endorphin, level may contribute to the repetition of the behavior. Wallerstein and Nock (2007) indicated that endogenous opioids and beta endorphins are released for emotion regulation. Given the fact that one of the underlying functions for individuals to engage in NSSI is to normalize their emotional state, it is assumed that NSSI activates the release of these neurochemicals. Walsh (2012) asserted that individuals who engage in NSSI have low levels of serotonin, similarly observed in individuals who are diagnosed with obsessive compulsive disorder. Although research interest in this area is growing, there is no certain explanation of the relationship between NSSI and biology. Further research is needed to make definite inferences about impacts of biology on NSSI engagement.

**Psychological risk factors.**

**Childhood abuse.** The literature suggests that early aversive experiences (i.e. childhood separation, parental separation, and trauma) had significant effect on NSSI engagement (Gratz, 2003). Because of the fact that these aversive experiences include various elements, in this section only childhood sexual, physical, and emotional abuse will be explored.

**Childhood sexual abuse.** In literature it can be found several studies that investigated the relationship between childhood sexual abuse and NSSI engagement. However, the findings of these studies were contradictory.
Studies in clinical samples indicated that there is a direct relationship between childhood sexual abuse and NSSI engagement. For example, Gladstone et al. (2004) study findings revealed a direct link between childhood sexual abuse and NSSI in their path analyses with patients who were diagnosed with depression. After further analysis, the authors concluded that even after controlling depressive symptoms, the relationship between NSSI and childhood sexual abuse remained significant. Likewise, Kaess et al. (2012) utilized a clinical sample of over one hundred patients to further examine the relationship between childhood sexual abuse and NSSI severity, frequency, and functions. According to the results, sexual abuse during childhood associated with NSSI frequency, but not with NSSI severity.

Congruent results were found in studies that used nonclinical samples. For example, in their study examining the relationship between childhood sexual abuse and suicidality among nonclinical population—which included both suicide attempts and NSSI—Bergen et al. (2003) found that nearly half of the participants who engaged in NSSI also reported childhood sexual abuse. When Glassman et al. (2007) examined the relationship between various childhood maltreatments—sexual, physical, and emotional abuse as well as NSSI among nonclinical adolescents—it was found that among other childhood maltreatments, only sexual abuse was significantly associated with NSSI.

After interviewing more than one hundred participants to investigate the mediating effect of dissociation and somatization on NSSI and childhood maltreatment relationship, Yates, Carlson, and Egeland (2008) found that among other childhood maltreatments, sexual abuse and recurrent NSSI (three or more incidents) were associated. Similarly, Weirich and Nock (2008) found a statistically-significant
correlation between sexual abuse and NSSI among adolescents when they examine the mediating factors of PTSD symptoms on childhood abuse and NSSI in a community sample.

Similar findings were echoed in adult population. Nock and Kessler (2006) utilized data from National Comorbidity Survey to be able to explore the potential clinical differences between suicide attempters and self-injurers, which were named as suicide gesturers. The authors found that respectively one quarter of the suicide gesturers experienced sexual abuse as a child.

In contrast to all these significant associations between childhood sexual abuse and NSSI, some studies claimed no correlation between these constructs. For instance, Rodrigues (2001) did not find a statistical relation between childhood sexual abuse and self-mutilation, among other self-destructive behaviors. Their results were supported by Klonsky and Moyer’s (2008) meta-analysis. After reviewing more than forty studies in relation to childhood sexual abuse and NSSI, the authors indicated that even though being sexually abused as a child explained nearly 6% of the variation in engaging in NSSI, this was not statistically significant. Similarly, Sawannell et al.’s (2012) study did not find a significant relation between two variables after interviewing more than ten thousand participants.

Although some studies indicate significant correlation between childhood sexual abuse and NSSI, several studies point no statistical relation between these two variables. In the absence of additional evidence, it is difficult to conclude that there is a direct relationship. Based on the body of literature reviewed in this section, we can reasonably
conclude that NSSI and childhood sexual abuse might share similar psychological characteristics.

Childhood physical abuse. Similar to childhood sexual abuse, there is evidence in the literature that childhood physical abuse correlates with current NSSI behaviors even though there is relatively little research within respect to this relationship.

For example, in a study investigating different risk factors (i.e. sexual, physical, emotional abuse, parental neglect and attachment, and dissociation) and NSSI relationship among college students, Gratz et al. (2002) indicated that physical abuse was significantly related to NSSI frequency. Analyses were conducted according to the following factors: biological sex, physical abuse during childhood, and NSSI engagement. NSSI behaviors were more likely with males than females. In a further study, Gratz and Chapman (2007) used male college students to examine the relationship with various risk factors and NSSI. It was found that participants in NSSI group reported higher numbers of childhood physical abuse in comparison to the non-NSSI group.

In a longitudinal prospective study, Yates et al. (2008) interviewed participants to investigate potential pathways between childhood maltreatment and NSSI engagement. The authors found that physical abuse during childhood had a positive association with intermittent NSSI (one or two NSSI incidents). Likewise, in a national study, Nock and Kessler (2006) utilized data from National Comorbidity Survey to explore the potential clinical differences between suicide attempters and self-injurers, which were named as suicide gesturers. According to the results, in comparison to suicide attempters, half of the suicide gesturers experienced physical abuse as a child.
However, findings in the larger body of literature are contradictory. Kaess et al. (2012) concluded that there is no causal relationship between physical abuse and NSSI. Similarly, in their study with substance abuse patients Bornovalova et al. (2011) indicated that physical abuse was not correlated with NSSI. Moreover, Glassman et al. (2007) study results indicated insignificant correlation for these variables.

In the absence of further evidence, it is difficult to say that NSSI and childhood physical abuse have a direct correlation. To be able to have definite conclusion, it is required to have further cross-sectional research that solely focus on childhood physical abuse and NSSI.

*Childhood emotional abuse.* There is limited number of studies that specifically examine the unique relationship between emotional abuse and NSSI; moreover, most results are not conclusive. In their studies, Yates et al. (2008) and Glassman et al. (2007) found significant correlation between childhood emotional abuse and NSSI; on the other hand, Bornovalova et al. (2011) and Goldstein et al (2009) did not find significant results.

The differences among these findings can be explained by the difficulties on operational definition of emotional abuse. It would be better to investigate the specific nature of emotional abuse, and how it contributes to NSSI engagement.

*Social risk factors.* Individuals coming from dysfunctional families or environments are more vulnerable to NSSI (Suyemoto & MacDonald, 1995). When self-injurious individuals were interviewed, they reported that their families had low level of qualified support (Klonsky & Glenn, 2009). The dynamic within an individual’s family is considered to be a factor as well (Halstead, Pavkov, Hecker, & Seliner, 2012). Consequently, lack of family structure, parental support and involvement can be
perceived as leading factors of NSSI. Moreover, Walsh (2012) indicates that individuals who experience loss or have relationship conflict are more prone to engage in NSSI. Thus, it is shown that NSSI engagement is related to family dynamics; though for solid conclusions, additional research in this area is required.

In addition to family and relationship dynamics, societal situations have an impact on NSSI engagement. Muehlenkamp (2006) indicated that NSSI is transferable from one individual to another by role modeling or admiration. Furthermore, Purington and Whitlock (2010) said the media has a powerful influence on individuals to engage in NSSI. Celebrities such as Angelina Jolie or Johnny Depp, movies like *Thirteen* or *Girl Interrupted*, and songs regarding NSSI, chat-rooms, and facebook pages are all sources of influence on susceptible individuals. Further studies need to be conducted to explore whether pop culture has an impact on NSSI behaviors, even though it is assumed to play a visible role.

**Self-esteem.** In the relevant literature, there are relatively limited studies in respect to the relationship between self-esteem and NSSI (Aizenman et al., 2007; Cawood et al., 2011; Harrison, 2009; Laye-Gindhu et al., 2005; Lundh et al., 2007; Tattnel et al., 2013). In their study with Canadian adolescents, Laye-Gindhu et al. (2005) examined the nature and the potential reasons for engaging in NSSI as well as its association with health-complaints, suicide history, and psychological adjustments. Participants who reported engaging in any form of NSSI behaviors had lower scores in self-esteem based on Reynold’s Adolescent Adjustment Screening Inventory. The authors further indicated that there was no biological sex difference in terms of self-esteem scores
and NSSI engagement. That means both boys and girls who engaged in NSSI also had lower scores in self-esteem measure.

Lundh et al. (2007) replicated the previous study by utilizing Swedish high school students to conduct a pilot study for adaptation of a short version of Deliberate Self-Harm Inventory (Gratz, 2001). The authors collected data as in regards to NSSI rates, biological differences, and to explore potential associations between self-esteem, mindfulness and NSSI. Results revealed that nearly 40% of self-injurers in comparison to nonself-injurers had lower scores on mindfulness and self-esteem. Even though this study was the first of its kind to include mindfulness in a research, the results cannot be generalized since it also evaluated suicidal intent and included more boys than girls in the sample.

A corresponding longitudinal study examining the interpersonal and intrapersonal functions of NSSI as well as NSSI cessation among Australian adolescents resulted in similar findings. According to the study results, having lower self-esteem scores was a significant predictor for NSSI engagement. Furthermore, it was found that higher self-esteem scores were positively associated with NSSI cessation (Tattnel et al., 2013) Even though the studies above utilized adolescents in their sampling, the results were promising for exploring the impact of self-esteem on NSSI engagement.

Another study conducted on college students examined the differences between students who self-injure and who tattoo/pierce in terms of motivation, functions, depression, and self-esteem (Aizenman et al., 2007). Significant results were found among participants who self-injured and tattooed/pierced in terms of independent variables. According to the results, nearly 40% of the participants who engaged in NSSI in their lives also had lower scores on Rosenberg Self-Esteem Scale than individuals who
had tattoos and piercings. Similarly, in an unpublished dissertation utilized college students; Harrison (2009) found that self-injurers had lower self-esteem rates, measured by Rosenberg Self-Esteem Scale, than nonself-injurers.

In yet another relevant path-analysis study, the association of self-esteem and NSSI as well as its mediating effect on personality disorder/NSSI relationship was investigated by Cawood et al. (2011) among college students. The study discovered that participants in the NSSI group had lower self-esteem scores than the non-NSSI group. In the mediating path hypotheses, it was found that self-esteem either partially or fully mediated the PD/NSSI relationship. The results of this study were promising because self-esteem was assessed as a mediator instead of a dependent variable.

Despite the small number of studies targeting the self-esteem-NSSI relationship, they reported insightful results: NSSI and self-esteem are inversely correlated among both adolescents and college students. However, since all the studies in this section utilized nonclinical samples in their studies, caution is needed in interpreting findings. Thus, further investigation using clinical sample is necessary to conclude that there is a negative correlation between self-esteem and NSSI engagement.

**Anxiety.** Previous research demonstrated that anxiety plays a significant role in engaging in NSSI due to its tension reduction nature (Andover et al., 2005; Glenn & Klonsky, 2009; Glenn & Klonsky, 2011; Golloust et al., 2008; Hoff & Muehlenkamp, 2009; Klonsky et al., 2003; Klonsky & Olino, 2008; Ross & Heath, 2002; Weinberg & Klonsky (2012). The majority of the studies in the literature were conducted using college students as their sample. For example, in a comparative study among college students, Andover et al. (2005) explored the psychological characteristics of an NSSI
group and a non-NSSI group via a psychometrically sound instrument. According to the comparison results, the NSSI group had statistically-significantly higher scores on anxiety, which was measured by the Trait form of STAI, over a control group. However, when the researchers added the factor of BPD disorder symptoms to the model, this difference shifted to being insignificant. In their online study, Golloust et al. (2008) aimed at finding the prevalent rates and relational predictors for NSSI, such as depression, eating disorders, and anxiety among college students. Of those who indicated NSSI engagement, nearly 20% of them had a probable anxiety disorder. The authors indicated that students in NSSI group had higher tendencies for anxiety. However, despite the fact that the findings of these two studies revealed that higher anxiety scores were positively correlated to NSSI engagement, these studies lacked further assessment for NSSI engagement; it was assessed as a dualistic characteristic, +NSSI or -NSSI.

In their exploratory study utilizing a psychometric instrument to collect data, Klonsky and Olino (2008) attempted to identify subgroups within self-injurers based on NSSI methods, NSSI functions, and clinical differences. After screening more than 800 college students, there were four subgroups: “experimental” (low likelihood of engagement), “mild” (high likelihood of engagement), “multiple functions/anxious” (low likelihood of engagement and low functions), “automatic functions/suicidal” (high likelihood of engagement and high functions). According to groups differences individuals in multiple functions/anxious group had higher anxiety scores than any other groups. The findings of this study were significant in the sense that not all individuals who engage in NSSI have high endorsement of psychiatric disorders. In a similar comparative study, Glenn and Klonsky (2009) examined the clinical (depression, anxiety,
and BPD) differences between suicide and NSSI among college students as well as whether or not being alone or around others play a significant role on NSSI engagement. The results of the study discovered that among other clinical variables anxiety was higher for NSSI group than non-NSSI group. Moreover, individuals who engage in NSSI do so when they are on their own.

In their study with college students that aimed at investigating the potential contribution of depression, anxiety, rumination, as well as perfectionism on NSSI engagement, Hoff and Muehlenkamp (2009) found participants who had higher scores on depression and anxiety, collected via trait from of STAI, also had increased rumination in comparison to non-NSSI group. Unlike their hypothesis, perfectionism did not predict NSSI engagement.

In a control-group laboratory study, Weinberg and Klonsky (2012) aimed at discovering the causal relationship between emotional regulation and NSSI engagement among college students. To accomplish this aim, participants were given either high or mild electric shocks as a replacement for NSSI. The study further investigated the clinical differences between NSSI and non-NSSI group. In the basis of clinical differences, NSSI group had higher levels of anxiety. Moreover, NSSI group with high electrical shocks showed decreased emotional tension in comparison to the control group.

Thus, to the best my knowledge, currently there is only one study investigating the potential predictors of prospective NSSI engagement. Furthermore, the results of this study contradicted previous study findings. Glenn and Klonsky’s (2011) longitudinal, control-group study utilized college students in order to investigate the potential predictors of NSSI over a period of time. To find potential prospective factors,
participants of this study were assessed at baseline and after one year for NSSI behaviors, Axis I disorders, BPD, and impulsivity. It was found that anxiety was not a predictor for prospective NSSI engagement; also it was not correlated with NSSI frequency, even though individual in NSSI group had higher tendencies for generalized anxiety disorder.

The relationship between anxiety and NSSI was investigated with different populations, i.e. adolescents and military recruits, and similar results were found. For example, Ross and Heath (2002) interviewed and surveyed high school students to gather data about NSSI characteristics and the clinical variables which were assumed to be related to NSSI engagement. NSSI was measured by one question in a stress management instrument that was designed by the authors. To gather more detailed information about NSSI, the participants were interviewed by a semi-structured interview. After completing the necessary analyses, it was found that participants in the NSSI group had higher scores on anxiety measures than their counterparts. Further, it was revealed that both depression and anxiety were significant predictors for NSSI engagement.

In another study, Klonsky et al. (2003) utilized individuals who were members of military to explore how common NSSI is and the potential associations for NSSI. The participants evaluated their peers in terms of personality traits and psychological disorders. NSSI was assessed by two items within an instrument. Results revealed that participants who engage in NSSI demonstrated higher scores on anxiety measures even after controlling for depression.

In light of these research findings, it can be said that anxiety and NSSI engagement have a direct relationship. Individuals who engaged in NSSI had higher scores on anxiety measures or have higher tendencies for anxiety disorder. These findings
were similar for adolescents, college students, and military recruits. However, some of the studies failed to provide actual rates of anxiety; instead, they relied on self-reports for data collection. Moreover, all the studies in respect to the anxiety-NSSI relationship were limited to nonclinical samples, so the results cannot be generalized to clinical samples. Thus, further research that utilizes psychometric instruments for data collection and uses clinical samples is required.

**Treatment of NSSI**

NSSI is a new phenomenon, so there is a lack of empirically-sound treatment approaches. Currently, effective treatment approaches for NSSI are not known, and the methods that exist in the field are highly questionable; moreover, a few studies directly related to the treatment of NSSI with control groups provide the only information (Muehlenkamp, 2006).

For instance, in their meta-analysis, Hawton et al. (1998) investigated effective treatment approaches for parasuicide behaviors, which include both NSSI and suicide. After reviewing twenty studies with and without control groups, the authors concluded that PS demonstrated a potential benefit for reducing parasuicidal behavior engagement. On the contrary, another meta-analysis found PS was not an effective treatment approach for NSSI engagement (Townsend et al., 2001). In addition to the meta-analyses, Muehlenkamp (2006) provided a comprehensive literature review for NSSI treatment approaches that are empirically supported. According to the author, NSSI is a learned and reinforced behavior. Individuals who engage in NSSI have disturbed cognitions, so CBT can be a treatment option.
Similarly, in a longitudinal study with more than fifty patients, Crowe and Bunclark (2000) aimed at evaluating the effectiveness of an inpatient program. In their study, the authors used CBT and PS approaches simultaneously to treat self-injury. According to the results, of the 58 patients, 32 of them demonstrated reduced self-harm behaviors after their discharge. In a relevant study, Raj, Kumaraiah, and Bhide (2001) utilized a control group to test the effectiveness of CBT and PS approaches on deliberate self-harm. According to the results, repeated self-injury was reduced by 5% at the 3 month assessment. Although the results of these studies were promising for the effectiveness of CBT and PS approaches on NSSI reduction, the sample sizes were very small and there was not adequate information about the progress of control group. Thus, certain conclusion cannot be made as in regards to effectiveness of CBT and PS approaches on NSSI treatment.

In a pilot study investigating the effectiveness of MACBT on reducing parasuicide symptoms, Evans et al. (1999) concluded that even though reduction was insignificant due to MACBT, with further research there is potential for this treatment approach to be successful. In a controlled randomized trial, Tyrer et al. (2003) expanded the previous research on the effectiveness of the MACBT approach. According to the results, the MACBT group demonstrated self-harm reduction in comparison to the control group, but this difference was not statistically significant. These two studies aimed to demonstrate the effectiveness of a MACBT treatment approach. However, both of the studies failed to exhibit significant results that MACBT is a better approach in comparison to usual treatment. These results can be attributed to the short term utilization.
In contrast, in their controlled trial, Slee et al. (2008) found significant results utilizing short-term MACBT. According to the results, participants in the experimental group demonstrated decreased self-harm behaviors over time than the control group participants. Similarly, in their studies with adolescents, Taylor et al. (2011) and Fischer et. al. (2013) tested the effectiveness of MACBT approach, defined as a “cutting down program.” According to the results, the adopted version helped in reducing NSSI engagement and frequency among adolescents. Although only two of the studies had randomized the control group, these studies demonstrated the effectiveness of MACBT approach in reducing NSSI frequency. These studies proved that to treat NSSI behaviors, it is not required to utilize long term treatment, since MACBT was limited to 8-12 sessions. Thus, this approach can be promising for community mental health agencies.

One of the other significant treatment approaches was DBT for reducing NSSI behaviors (Muehlenkamp, 2006). According to the founder of DBT, this approach exhibited significant results in reducing parasuicidal behaviors, which include NSSI and suicide attempts, for patients who were diagnosed with borderline personality disorder (Comtois et al., 2007; Linehan et al., 1991; Linehan et al., 1993; Linehan et al., 2006). Further research results indicated that DBT was an effective for comorbid diagnosis as well. In their studies with patients diagnosed with BPD as well as substance abuse, DBT had significant impact on reducing parasuicidal behaviors (Dimeff at al., 2000; Linehan et al., 1999; Linehan et al., 2002). The extent of the research in relation DBT also reaches beyond American borders; in international studies, researchers also found significant results for the effectiveness of DBT (Bohus, 2004; Bohus et al., 2000; Van Den Bosch et al., 2005; Verheul et al., 2003).
Even though the research demonstrated significant improvement on NSSI by utilizing DBT, most of the studies include suicidal behaviors and the combination of NSSI and suicide. Participants of the aforementioned studies were diagnosed with BPD, so making generalizations to nonclinical samples was not effective. Since DBT was proven to be an effective treatment approach for adults, research was conducted to adapt this approach for younger participants. There are limited numbers of studies that utilized participants without BPD, however.

In a one-year follow-up controlled group study, inpatient adolescents were treated using DBT and treatment as usual for depressive symptoms, hopelessness, and parasuicide behaviors (Katz et al., 2004). According to the study’s findings, both groups had lower rates for depressive symptoms, hopelessness, and parasuicidal behaviors. The author indicated that further research was required for DBT to be proven effective against usual treatment for outcome variables.

Similarly, in another study with female adolescent self-injurers, James (2008) investigated whether or not DBT would be an effective treatment for reducing deliberate self-harm. According to study findings, participants had lower levels of DSH during an 8-month follow-up. Similar findings were echoed by Fleischhaker et al. (2011). In their study, researchers adopted DBT for adolescents to gather data on suicidal and self-injureing adolescents. After one-year follow-up, participants reported reduced suicide attempts and NSSI frequencies. In a 6-week DBT pilot study, Perepletchikova, Axelrod, Kaufman, Rounsaville, Douglas-Palumberi and Miller (2011) tested the efficacy of several DBT techniques with a nonclinical sample. The findings revealed that participants exhibited alleviated depressive symptoms and NSSI behaviors. The results of these
studies show that DBT is a promising approach to treat NSSI among younger population. However, caution is required to make general conclusions due to the nonclinical nature of the samples, lack of control groups, and relatively small sample sizes. Finally, even though it is lacking in empirical support, Kamen (2009) proposed that motivational interviewing (MI) can be utilized to treat NSSI. The author further suggested that NSSI can be addictive in long run due to its connectedness to neurotransmitters, so MI can be an alternative approach for NSSI treatment.

Based on study results, it is obvious that NSSI is a complex phenomenon to be treated. There are several studies in literature demonstrated significant results for various treatment options for NSSI; however, it is difficult to conclude which one treatment approach was better than the other. Considering small sample sizes, lack of control groups, and definitional problems limitations among studies, it is safe to conclude that further research in this area is needed.

**Summary**

This chapter explained the overall concept of NSSI. Definitions, historical development, and classification of NSSI were presented. Moreover, age of onset, types, and prevalent rates of NSSI were further explored. Outcomes with respect to biological sex and NSSI engagement were provided. NSSI functions were described in detail with additional functional models. Associated risk factors of NSSI were explained through biological, psychological, and social perspectives. Furthermore, a critical review investigating the relationship between self-esteem, anxiety, and NSSI engagement was explored. Lastly, treatment approaches for NSSI were identified.
Even though the literature on the relationship between self-esteem and NSSI as well as anxiety and NSSI is growing, there is limited research examining the potential roles of self-esteem, state anxiety, trait anxiety as predictors on lifetime NSSI frequency. Thus, the research study will investigate the potential predictive relational model of self-esteem, state anxiety, trait anxiety, as well as biological sex and current/lifetime NSSI occurrence. Moreover, this research is an exploratory study of the relationship between self-esteem, state anxiety, trait anxiety, and NSSI functions. In order to gain in-depth understanding about NSSI, this study will explore the relationship between these variables.

The following chapter will elaborate on the methodology of current study. Additionally, research instruments to be able to conduct this study will be discussed.
Chapter 3: Method

This chapter will address the methodology used to conduct the research. In addition, the operational definitions of variables, sampling plan, description of instruments employed during this study will be provided. Further, information will be given regarding data collection and data analysis sections.

Procedure

The purpose of the study was to explore the prevalence of non-suicidal self-injury (NSSI) and perceptions of NSSI functions among undergraduate college students before and after commencing college. Additionally, the study aimed to investigate predictive relationships between self-esteem (SE), state anxiety (SA), trait anxiety (TA), and biological sex in explaining lifetime NSSI occurrence and current NSSI occurrence. The interpersonal and intrapersonal NSSI functions were explored. The study added to previous research by focusing on the perceptions of undergraduate college students who do not engage in NSSI regarding common NSSI functions. The main research question for this study was: what is the prevalence of NSSI reported by undergraduate college students about themselves and their friends or acquaintances a) before commencing college, b) while in college.

The participants of this study were undergraduate college students in a Midwestern University enrolled in general education courses. To be able to accomplish data collection, the participants were asked to complete self-report instruments for NSSI, SE, SA, and TA as well as a demographics questionnaire. The data gathered from the instruments and questionnaire were analyzed in order to present results by descriptive and logistic regression analysis methods. Prior to the data collection, the researcher submitted
and gained approval for current study from Ohio University Institutional Review Board (IRB).

**Research questions and hypotheses.** Current study aimed at answering questions below:

**Question 1:** What is the prevalence of NSSI reported by undergraduate college students about themselves a) before commencing college, b) while in college?

**Question 2:** What is the prevalence of NSSI reported by undergraduate college students about their friends or acquaintances a) before commencing college, b) while in college?

**Question 3:** Do self-esteem, state anxiety, trait anxiety, and biological sex explain the predictive relationship in current NSSI occurrence among undergraduate college students?

**Null Hypothesis:** There will be no significant predictive relationship differences in self-esteem, state anxiety, trait anxiety, and biological sex in explaining current NSSI occurrence among undergraduate college students.

**Question 4:** Do self-esteem, trait anxiety, and biological sex explain predictive relationship in lifetime NSSI occurrence among undergraduate college students?

**Null Hypothesis:** There will be no significant predictive relationship differences in self-esteem, trait anxiety, and biological sex in explaining lifetime NSSI occurrence among undergraduate college students.
**Question 5:** What is the correlation between lifetime NSSI frequency, current NSSI frequency, self-esteem, state anxiety, trait anxiety, interpersonal NSSI functions, and intrapersonal NSSI functions among undergraduate college students who engage in NSSI?

**Question 6:** What are common functions of NSSI endorsed by undergraduate college students who do not engage in NSSI?

**Question 7:** Are there differences between what functions are endorsed by two groups: (1) undergraduate college students who engage in NSSI and (2) undergraduate college students who do not engage in NSSI?

**Null Hypothesis:** There are no significant group differences in terms of what NSSI functions are endorsed by two groups: (1) undergraduate college students who engage in NSSI and (2) undergraduate college students who do not engage in NSSI.

**Population.** The target population for this study was undergraduate college students who were enrolled in bachelor’s degrees at a Midwestern University.

**Sampling procedure.** For this study, purposeful sampling method was employed, and the study was exploratory in nature. To be able to accomplish a representative sample, general education courses were utilized. These courses were selected from online course catalog that included but not limited to Human Relations, Stress Management, and Career and Life Planning Seminar. There are several reasons for selecting general education courses. By selecting general education courses, it was expected to garner a wide range of perspectives. Further, it was anticipated to have more representative of diverse majors.
The sample size for this study was based on Brooks and Barcikowski’s (2012) multiple regression sample size recommendation. In their article, the authors’ purpose was to find better ways to figure out necessary sample sizes for studies that utilize multiple regression. They called this method as precision efficacy analysis. In addition, this method was based on cross-validation which estimates the accuracy of the prediction model in application. Precision efficacy in this model was defined as expectancy of fit for regression model performance for future samples; moreover, it was considered as the power of cross-validation. That means the higher the precision efficacy the more generalizability of the regression model for future studies. According to the authors, this model was superior to other sample size models because it provided information on how many participants are required for each variable instead of each predictor Brooks and Barcikowski.

Based on Brooks and Barcikowski’s (2012) recommendations, the study aimed finding moderate effect size ($p^2 = .25$) with .80 precision efficacy (power) estimate. According to Brooks and Barcikowski, to be able to accomplish these conditions, 28 subjects were required for each variable, including the dependent variable. Due to the fact that this study includes 7 variables (including dependent variable), the total sample size for the current study included approximately 196 participants.

231 undergraduate students completed the survey package. A final sample of 221 provided usable data for analysis. Of the participants, 8.1% of them were freshman, 14.9% of them were sophomore, 21.7% of them were junior, and 55.2% of them were seniors. Regarding biological sex, 52% of them were female and 48% were male. The racial composition of the population was 73.8% Caucasian, 12.2% international, 7.7%
African American, 2.7% multiracial, 1.8% Asian American, and 1.4% Hispanic. For marital status, 90.5% of the overall participants were single, while 9.5% were married or partnered. Participants were predominantly heterosexual, 91.4%.

**Instrumentation.** This section will provide information with respect to all the instruments will be utilized in this study.

**Inventory of Statements about Self-Injury (ISAS).** NSSI behaviors, frequencies, and functions will be measured by Inventory of Statements about Self-Injury (ISAS) (Klonsky & Glenn, 2009). To be able to collect data based on this study’s purpose; this instrument was modified after the authors’ permission was granted. The original ISAS is a self-report instrument that has two different sections (Appendix A). Section I has seven questions and assesses the frequency of twelve specific NSSI behaviors over the lifetime. Respondents are asked to rate how many times they engage in NSSI behaviors “intentionally and without suicidal intent.” NSSI behaviors that are assessed are cutting, burning, biting, pinching, banging/hitting self, carving, needle-sticking, rubbing skin, swallowing chemicals, scratching, hair pulling, and wound picking. After permission was granted from the original authors, the instrument was modified. The modified instrument reduced the number of NSSI behaviors from twelve to six and asked to assess the frequency of these behaviors before and after commencing college. Two additional questions were added asking the number of friend or acquaintances are known before and after commencing college.

The remaining five questions assess age of onset, elapse time, and whether or not respondents feel pain, consider stopping the behavior, and being alone during NSSI. In the modified version of the instrument respondents are asked to complete section II-a if
they endorse any of the NSSI behaviors in section I or complete section II-b if they do not endorse any NSSI behaviors in section I.

The second section of the instrument has 39 questions and assesses the functions of NSSI. The items are coded on 3 point-scale ranging as very relevant (3), somewhat relevant (2), and not relevant (1). The respondents are asked to rate how relevant the items are to complete the statement “When I harm myself, I am…” There are 13 specific functions of NSSI and each function has 3 different items. The functions assessed are “a) affect regulation, b) anti-dissociation, c) anti-suicide d) marking stress, e) self-punishment, f) autonomy, g) interpersonal boundaries, h) interpersonal influence, i) peer bonding, j) revenge, k) self-care, l) sensation seeking, and m) toughness” (Klonsky & Glenn, 2009, p. 217). The functions were grouped into two distinct categories, interpersonal and intrapersonal functions (Klonsky, 2007). After permission was granted from the original authors, section II-b was added to the instrument asking respondents whether or not the statements for NSSI functions are true for people who engage in NSSI. The modified section II-b used the same statements and rating scale as section II-a.

Reliability and Validity. Klonsky and Olino (2008) reported an alpha coefficient of .84 for internal consistency of section I of ISAS. The authors further reported that four weeks test-retest reliability of the instrument was .85. In addition, Glenn and Klonsky (2011) reported that one-year test-rest reliability was .68. In section II, coefficient alpha for interpersonal functions was .88 and .82 for intrapersonal functions. One year test-retest reliability was .82 for interpersonal function, and .60 for intrapersonal functions for section II (Glenn & Klonsky, 2011). Construct validity of the instrument was evidenced by the significant correlation with depression, anxiety, borderline personality disorder,
and suicide scales (Klonsky & Glenn, 2009). In this study, the Cronbach’s alpha reliability coefficient for section II-a interpersonal functions for self was .94 and .90 for intrapersonal functions for self. Further, the Cronbach’s alpha reliability coefficient for section II-b interpersonal and intrapersonal functions for others were .92 and .88, respectively.

**Rosenberg Self-Esteem Scale (RSES).** Self-esteem will be measured by Rosenberg Self-Esteem Scale (RSES) (Rosenberg, 1965). The aim of the instrument is to assess an individual’s overall worthiness as a person (Appendix B). The instrument uses self-report, and it has five positively and five negatively worded items. The participants are asked to rate their level of agreement to the items, and it is coded on a 4-point scale ranging from 1 (strongly disagree) to 4 (strongly agree).

**Reliability and Validity.** Rosenberg (1989) reported .92 reproducibility coefficient for the instrument. Ang, Neubronner, Oh, and Leong (2001) indicated an alpha coefficient of .71 for internal consistency. Test-retest reliability of the instrument ranged from .72 to .88 (Gray-Little, Williams, and Hancock, 1997). The face validity of the instrument was based on the results that RSES was negatively correlated with depressive affect scale and psychoneurotics scale (Rosenberg, 1989). Construct validity of the instrument was evidenced by positive correlations with Coopersmith Self-Esteem Inventory (Robinson & Shaver, 1980) and negative correlations with depression and anxiety measures (Bagley, Bolitho, & Bertrand, 1997). In this study, the Cronbach’s alpha reliability coefficient for the instrument was .91.
**State Trait Anxiety Inventory (STAI).** Anxiety variable will be measured by State Trait Anxiety Inventory (STAI) (Speilberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). STAI is a self-report instrument developed for high school and college students, and adults (Spielberger, 1983). The purpose of the instrument is to assess both the intensity of anxiety at the moment and proneness to anxiety in general (Appendix C). Aforementioned purposes, the inventory has two forms that assess state and trait levels of anxiety. Each form has 20 items that ask participants to report how they feel at the moment and in general. State anxiety form (Form Y-1) assesses mainly the feelings of apprehension, worry, tension, and nervousness (Spielberger, 1983). Respondents are asked to rate their state anxiety at the moment on a 4-point scale ranging from “not at all” to “very much so.” The proneness towards anxiety is assessed by trait anxiety form (Form Y-2). Participants are asked to respond how often they have anxiety related feeling and thoughts on a 4-point scale range from “almost never” to “almost always”. It only requires 10 minutes to complete both forms for college students. The instrument requires sixth grade reading level (Spielberger, 1983).

**Reliability and Validity.** Spielberger (1983) reported that alpha coefficients for internal consistencies for both forms ranged from .86 to .95 for different norm groups. The median test-retest reliability for trait anxiety form was .76 and .33 for state anxiety form. Construct validity of the instrument was evidenced by score differences between psychiatric patients, military recruits, and college students. Spielberger indicated that concurrent validity of the instrument was based on the results that STAI was significantly correlated with other measures of anxiety (.80 respectively). Convergent and divergent validity of STAI instrument was evidenced by significant correlations with personality
measures and insignificant correlations with aptitude and achievement tests (Speilberger, 1983). In this study, the Cronbach’s alpha reliability coefficient for trait anxiety was .93 and .92 for state anxiety.

**Demographic Questionnaire.** A demographic questionnaire was utilized to gather information from participants (Appendix D). The questionnaire contained descriptive information about the participants. Such information included age, year in school, major, biological sex, ethnicity, sexual orientation, and marital status.

**Operational definitions of variables.**

**Lifetime NSSI frequency.** A continuous variable of lifetime NSSI frequency was calculated by summing up the number of acts participants report engaging any form of NSSI on behavior section of the ISAS instrument (Glenn & Klonsky, 2010). The current study had the same procedure for continuous NSSI variable.

**Current NSSI frequency.** A continuous variable of current NSSI frequency was calculated by summing up the number of acts participants report engaging any form of NSSI on behavior section of the ISAS instrument (Glenn & Klonsky, 2010) after commencing college.

**Lifetime NSSI occurrence.** A dichotomous NSSI variable was created by assigning “1” to participants who report engaging in any form of NSSI behavior and “0” to participants who do not endorse NSSI behaviors before and after commencing college in the behavior section of ISAS. Previous studies used 5 or 10 times NSSI behavior engagement as a cut-off point (Gratz, 2001; Dulit, 1994), but these studies failed to provide a through justification for these specific numbers. Thus, in this study zero NSSI occurrence was used as a cut-off point to create dichotomous variable.
Current NSSI occurrence. A dichotomous NSSI variable was created by assigning “1” to participants who report engaging in any form of NSSI behavior and “0” to participants who do not endorse NSSI behaviors after commencing college in the behavior section of ISAS.

NSSI functions. A continuous variable of interpersonal and intrapersonal NSSI functions was calculated by summing up the related subscale scores on the functions section of the ISAS instrument.

Self-esteem. The self-esteem scores were gathered utilizing RSES instrument by summing up 4-point scale items after reverse-scoring negatively worded items. At the end of the scoring, an individual gets a global self-esteem score that ranges from 10 to 40.

Anxiety. State and trait anxiety scores were gathered using STAI instrument by summing up 4-point scale items after revere-scoring anxiety-free items for each form. The total score for each form ranges from 20 to 80.

Data Collection Procedures

After reviewing general education courses via the university online course catalog, course instructors were contacted either via e-mail or face-to-face to discuss the purpose of the study. During this communication, permission was requested to distribute the surveys to the potential participants during class time. The researcher prepared a script that explains the aim and the significance of the study. Then, the researcher went to each class during the assigned time and place to collect data. Prior to giving survey package, the researcher read the pre-prepared script to the student and emphasized the voluntary nature of the study. Course instructors were not present during data collection, and students were assured that their participation will not be tied to their performance on
the course in any way. The researcher distributed the survey package to the students and waited until all of the volunteers complete the package. When participants finished completing the survey package, they placed it into the box in order to protect the anonymity. Participants in the study were provided with information on how to access counseling services at the University Counseling Center.

For data collection and analysis, quantitative methodology was utilized. The instruments were distributed to the participants after the proposed study is approved by IRB at Ohio University. The questionnaires were distributed in paper form during class time. The survey package included inform consent and a statement that no compensation will be provided. Moreover, information regarding the purpose and importance of the study, information about the anonymity, and the anticipated time to complete the study was provided.

Participants responded to the survey questions after the description of the study and informed consent, the anticipated time for completion, the statement of confidentiality, and invitation to participate in the study. The survey consisted of demographics questionnaire, ISAS, RSES, and both STAI forms.

Data Analysis Procedures

Data collected from participants, was checked for accuracy, scored, and recorded using statistical package SPSS. The types of analyses utilized was determined by the research hypothesis being tested. Data analysis was conducted utilizing SPSS version 22.0. Cronbach’s alphas and descriptive statistics were computed for each instrument.

Data analysis. Descriptive analysis was utilized in order to investigate the lifetime and current NSSI occurrence among undergraduate college students as well as
the common NSSI functions among students who do not engage in NSSI. Logistic regression was utilized for this study to determine whether self-esteem, state anxiety, trait anxiety, and biological sex significantly explain the predictive relationship in lifetime and current NSSI occurrence. Logistic regression is used in studies where dependent variable is binary, and it is predicted from continuous and/or binary independent variables (Tabachnick & Fidell, 2001). Due to the fact that the dependent variable of the current study was the existence versus absence of NSSI among undergraduate college students, and it was predicted from self-esteem, state anxiety, and trait anxiety continuous variables as well as biological sex binary variable. Taken together, it was considered applicable to utilize logistic regression in data analysis. Additionally, an independent samples t-test was used to determine whether there will be significant group differences in relation to endorsed NSSI functions. Moreover, to be able find out the relationships between lifetime NSSI frequency, current NSSI frequency, self-esteem, state anxiety, trait anxiety, and NSSI functions, correlation analysis was utilized. Descriptive, intercorrelational, and logistic regression analyses were conducted at alpha level of .05.

**Analysis of research questions.**

**Question 1:** What is the prevalence of NSSI reported by undergraduate college students about themselves a) before commencing college, b) while in college?

Descriptive analysis was conducted in order to examine the prevalence of NSSI among undergraduate college students before and after starting to college.
Question 2: What is the prevalence of NSSI reported by undergraduate college students about their friends or acquaintances a) before commencing college, b) while in college?

Descriptive analysis was conducted in order to examine the prevalence of NSSI among undergraduate college students’ friends and acquaintances before and after starting to college.

Question 3: Do self-esteem, state anxiety, trait anxiety, and biological sex explain the predictive relationship in current NSSI occurrence among undergraduate college students?

Null Hypothesis: There will be no significant predictive relationship differences in self-esteem, state anxiety, trait anxiety, and biological sex in explaining current NSSI occurrence among undergraduate college students.

In order to investigate the hypotheses regarding predictive relationship of self-esteem, state anxiety, trait anxiety, and biological sex on current NSSI occurrence, logistic regression analysis was conducted. This analysis sought to determine whether or not self-esteem, state anxiety, trait anxiety, and biological sex significantly explain predictive relationship in current NSSI occurrence among undergraduate college students.

Question 4: Do self-esteem, trait anxiety, and biological sex explain predictive relationship in lifetime NSSI occurrence among undergraduate college students?

Null Hypothesis: There will be no significant predictive relationship differences in self-esteem, trait anxiety, and biological sex in explaining lifetime NSSI occurrence among undergraduate college students.
In order to investigate the hypotheses regarding predictive relationship of self-esteem, trait anxiety, and biological sex on lifetime NSSI occurrence, logistic regression analysis was conducted. This analysis sought to determine whether or not self-esteem, trait anxiety, and biological sex significantly explain the predictive relationship in lifetime NSSI occurrence.

Question 5: What is the correlation between lifetime NSSI frequency, current NSSI frequency, self-esteem, state anxiety, trait anxiety, interpersonal NSSI functions, and intrapersonal NSSI functions among undergraduate college students who engage in NSSI?

Correlation analysis was conducted in order to investigate the hypothesis regarding the relationship on measures of self-esteem, state anxiety, trait anxiety, interpersonal NSSI functions, and intrapersonal NSSI functions. This analysis sought to determine whether or not self-esteem, state anxiety, trait anxiety, interpersonal NSSI functions, and intrapersonal NSSI functions have correlations.

Question 6: What are common functions of NSSI endorsed by undergraduate college students who do not engage in NSSI?

Descriptive analysis was conducted in order to garner information from undergraduate college students who do not engage in NSSI regarding common NSSI functions.

Question 7: Are there differences between what functions are endorsed by two groups: (1) undergraduate college students who engage in NSSI and (2) undergraduate college students who do not engage in NSSI?
**Null Hypothesis**: There are no significant group differences in terms of what NSSI functions are endorsed by two groups: (1) undergraduate college students who engage in NSSI and (2) undergraduate college students who do not engage in NSSI.

An independent samples *t* test was utilized whether or not two groups (1) undergraduate college students who engage in NSSI and (2) undergraduate college students who do not engage in NSSI endorse different NSSI functions.

**Summary**

This chapter provided information as in regards to methodology of this study. The procedure of the study was explained in detail. Further, information about the instruments used was presented. Data collection procedure along with data analysis procedure was explained. Next chapter elaborates on the results of the study.
Chapter 4: Results

This chapter presents the results of data analyses of the seven research questions presented in Chapter 1. Furthermore, this chapter offers findings of preliminary and supplementary analyses.

Preliminary Analyses

Preliminary analyses included the data-cleaning procedures to examine and deal with invalid and missing data as well as the calculation of mean and standard deviation for study variables. Internal consistency of all the measures was examined by calculating Cronbach’s alpha coefficients. Furthermore, the assumptions for logistic regression analyses were explained along with descriptive statistics.

Data Cleaning Procedure

After the data was collected, it was screened in order to deal with invalid and missing data. Total number of surveys collected was two hundred and thirty one. Of the 231 surveys, there were ten incomplete surveys with several items missing on the research measures. These surveys were eliminated due to lack of accurate information. This resulted in 221 usable surveys for data analyses. Tabachnick and Fidell (2001) indicated that if 5% of the cases have missing data, these cases can be ignored. For this study, ten cases made up 4.3 % of the total cases.

Assumptions of Logistic Regression

In order to evaluate whether the main statistical analysis met the criteria, necessary logistic regression assumptions were tested. The assumptions for logistic regression analysis were tested following Meyers’s (2006) suggestions. Diagnostic
analyses were conducted in order to test the necessary assumptions to conduct logistic regression analyses.

The first assumption of logistic regression was no perfect multicollinearity (Meyers, 2006). This assumption was tested through producing collinearity statistics and diagnostics in linear regression. Due to the nature of statistical package used in this study, it was not possible to create collinearity statistics, so these statistics from the regression were utilized to test this assumption. Variance inflation factor (VIF) values for biological sex (1.02), state anxiety (SA, 2.85), trait anxiety (TA, 3.37), and self-esteem (SE, 3.34) were within normal limits. This indicated no perfect multicollinearity.

The second assumption of logistic regression was goodness of fit of the model. In order to test this assumption, the Hosmer-Lemeshow goodness of fit test results were utilized. According to the results, the model was a good fit for the data, $X^2 = 7.45, p = .488$. The third assumption of logistic regression was the presence of a binary dependent variable. To be able to fulfill this assumption, a dichotomous variable was created by grouping cases depending on lifetime non-suicidal self-injury (NSSI) engagement and current NSSI engagement, which was indicated after the participants commenced college.

The fourth assumption of logistic regression was independent variables need to be measured by summative scales, interval, or ratio levels. Independent variables TA, SA, and SE were all measure by 4-point Likert scales, so this assumption requirement was met.

In sum, the assumptions of the logistic regression were evaluated through conducting collinearity statistics and goodness-of-fit as well as creating a categorical variable. The results of these analyses yielded that the logistic regression assumptions
were met. In the following sections, descriptive statistics are presented, followed by testing research questions.

**Descriptive Statistics**

Means, standard deviations, and the range of the study variables are presented in Table 1. Sample sizes varied based on study variables. The reason for this difference was due to the sampling and missing data. For instance, lifetimeNSSI group included seventy-one participants, out of 221, who engaged in NSSI throughout their lives while current NSSI group had forty-four people who engage in NSSI after commencing college. Lastly, TA score as well as interpersonal functions of others score had one missing participant.

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
<th>skew</th>
</tr>
</thead>
<tbody>
<tr>
<td>lifetimeNSSI</td>
<td>71</td>
<td>167.63</td>
<td>489.90</td>
<td>1</td>
<td>3100</td>
</tr>
<tr>
<td>currentNSSI</td>
<td>44</td>
<td>108.45</td>
<td>248.30</td>
<td>1</td>
<td>1100</td>
</tr>
<tr>
<td>Trait Anx</td>
<td>220</td>
<td>40.91</td>
<td>11.66</td>
<td>20</td>
<td>72</td>
</tr>
<tr>
<td>State Anx</td>
<td>221</td>
<td>40.17</td>
<td>12.37</td>
<td>20</td>
<td>75</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>221</td>
<td>31.82</td>
<td>6.50</td>
<td>12</td>
<td>40</td>
</tr>
<tr>
<td>Interother</td>
<td>220</td>
<td>20.97</td>
<td>9.91</td>
<td>0</td>
<td>48</td>
</tr>
<tr>
<td>Intraother</td>
<td>221</td>
<td>18.36</td>
<td>6.87</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>Interself</td>
<td>71</td>
<td>12.28</td>
<td>11.17</td>
<td>0</td>
<td>37</td>
</tr>
<tr>
<td>Intraself</td>
<td>71</td>
<td>13.40</td>
<td>7.92</td>
<td>0</td>
<td>28</td>
</tr>
</tbody>
</table>

*Notes: lifetimeNSSI = non-suicidal self-injury before and after college, currentNSSI = NSSI during college, Trait Anx = trait anxiety score, State Anx = state anxiety score, Self-Esteem = self-esteem score, interother = interpersonal functions for others, intraother = intrapersonal functions for others, interself = interpersonal functions for self, intraself = intrapersonal functions for self*
Descriptive statistics of the participants. The age of the population ranged from 18 to 45 (\(M=20.9, SD=2.5\)). Of the participants, 8.1% of them were freshman, 14.9% of them were sophomore, 21.7% of them were junior, and 55.2% of them were seniors. Regarding biological sex, 52% of them were female and 48% were male. The racial composition of the population was 73.8% Caucasian, 12.2% international, 7.7% African American, 2.7% multiracial, 1.8% Asian American, and 1.4% Hispanic. For marital status, 90.5% of the overall participants were single, while 9.5% were married or partnered. Participants were predominantly heterosexual, 91.4%.

Descriptive statistics of NSSI group. From the sample of 221, seventy-one participants indicated that they “intentionally (i.e., on purpose) and without suicidal intent (i.e., not for suicidal reasons) performed NSSI behaviors” in the ISAS questionnaire; that resulted in a 32% prevalence rate. The age of participants ranged from 18 to 26 (\(M = 20.93, SD = 1.8\)). Of the participants who engaged in NSSI, 56% of them were female and 44% of them were male. The majority of the participants reported that they were single (89%) and heterosexual (83%). The racial composition of the participants who engaged in NSSI was 69% Caucasian, 16% international, 8% African American, 2% Hispanic, 1% Asian American, and 1% multiracial.

The lifetime NSSI frequency ranged from 1 to 3100 (\(M = 167.3, SD = 489.9\)) measured by ISAS. However, the distribution was skewed, due to having outliers higher than three standard deviations. The total number of five outliers, which were different for each NSSI behaviors, were identified during data screening process. Cohen, West, and Aiken (2003) argued that "if outliers are few (less than 1% or 2% of n) and not very extreme, they are probably best left alone" (p.128). Based on this argument, total number
of five outliers were included in the logistic regression analysis since the data was already skewed. Mean scores with and without outliers for each NSSI behavior for participants in NSSI group are presented in Table 2.

Table 2.

NSSI Behavior Descriptive Statistics With and Without Outliers for NSSI Group

<table>
<thead>
<tr>
<th>NSSI Behaviors</th>
<th>With outliers</th>
<th></th>
<th>Without outliers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>M</td>
<td>SD</td>
<td>n</td>
</tr>
<tr>
<td>Interfering with wound healing</td>
<td>71</td>
<td>70.81</td>
<td>272.88</td>
<td>69</td>
</tr>
<tr>
<td>Banging</td>
<td>71</td>
<td>35.28</td>
<td>237.18</td>
<td>70</td>
</tr>
<tr>
<td>Hair pulling</td>
<td>71</td>
<td>26.77</td>
<td>142.73</td>
<td>69</td>
</tr>
<tr>
<td>Cutting</td>
<td>71</td>
<td>25.36</td>
<td>177.76</td>
<td>70</td>
</tr>
<tr>
<td>Burning</td>
<td>71</td>
<td>4.78</td>
<td>19.77</td>
<td>70</td>
</tr>
<tr>
<td>Scratching</td>
<td>71</td>
<td>4.26</td>
<td>15.31</td>
<td>70</td>
</tr>
</tbody>
</table>

Note: different cases were deleted for each NSSI behavior.

Participants reported various forms of NSSI. Even though there were twelve specific NSSI behaviors in the instrument, only six of them were chosen by the researchers during instrumentation modification process. Based on descriptive statistics, interfering with wound healing was preferred by 49.2% of the participants followed by banging (38%), cutting (36.6%), hair pulling (33.8%), scratching (21.2%), and burning
(19.7%). Scratching was preferred by 73.3% of the females, while banging was preferred by 51.8% of the males.

The age of onset for NSSI engagement ranged from 3 to 18 years. The mean age of onset was found to be 12 years of age ($SD = 3.2$). The results were presented in Figure 1.

![NSSI Age of Onset](image)

*Figure 1: NSSI Age of Onset*

Participants who engaged in NSSI reported results concerning pain. More than half of the participants ($n=38$) in NSSI group indicated that they “sometimes” feel pain, 32% ($n=23$) of them indicated they do not feel pain, and 7% ($n=10$) of them reported feeling pain while engaging in NSSI. Results in relation to pain were presented in Figure 2.
When participants were asked whether or not they engage in NSSI while alone, 74.6% of them (53) said “no,” 9 of them said “sometimes,” and 9 of them said “yes.” In terms of time elapse between NSSI engagements, 29 of the participants (40.8%) said “more than a day,” 27 of them (38%) said “less than 1 hour,” 11 of them (15.5%) said “1-3 hours,” and 4 of them (5.6%) said “3-6 hours.” When participants were asked whether or not they wanted to stop NSSI, 51 of them (71.8%) said that they wanted to stop NSSI.
Testing the Research Questions and the Null Hypotheses

**Question 1.** What is the prevalence of NSSI reported by undergraduate college students about themselves a) before commencing college, b) while in college?

The first research question examined the NSSI engagement prevalence differences before and after college, and a 2x2 crosstab analysis was conducted. The results of the analysis are presented in Table 3.

Table 3.

**NSSI Prevalence Before and After Commencing College**

<table>
<thead>
<tr>
<th>Did not engage in NSSI before college</th>
<th>Did engage in NSSI before college</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did not engage in NSSI after college</td>
<td>150</td>
<td>2</td>
</tr>
<tr>
<td>(67.9%)</td>
<td>(0.9%)</td>
<td>(68.8%)</td>
</tr>
<tr>
<td>Did engage in NSSI before college</td>
<td>27</td>
<td>42</td>
</tr>
<tr>
<td>(12.2%)</td>
<td>(19.0%)</td>
<td>(31.2%)</td>
</tr>
<tr>
<td>Total</td>
<td>177</td>
<td>44</td>
</tr>
<tr>
<td>(80.1%)</td>
<td>(19.9%)</td>
<td>(100.0%)</td>
</tr>
</tbody>
</table>

Note: NSSI=non-suicidal self-injury

The results of a Chi-Square test of independence were statistically significant $\chi^2(1) = 10.55, p < .05$. That means there is an association between engaging in NSSI before college and after college. According to the Table 3, lifetime NSSI prevalence was 32.1% among college students. Even though one third of the college students reported engaging in NSSI before starting to college, this rate decreased by nearly 12% after starting college
(31.2% before college, 19.9% after college). Thus, the survey indicated that after commencing college, the rate at which people engaged in NSSI decreased.

**Question 2.** What is the prevalence of NSSI reported by undergraduate college students about their friends or acquaintances engaging in NSSI a) before commencing college, b) while in college?

The second research question examined the prevalence of having a friend or knowing someone who engaged in NSSI before and after college, and a 2x2 crosstab analysis was conducted. The results of the analysis are presented in Table 4.

Table 4.

| Number of Friends or Acquaintances Who Engage in NSSI Before and After Commencing College |
|---------------------------------------------------------------|---------------------------------|----------------|----------------|
| Did not know                                                  | Did know                       | Total          |
| Did not know                                                  | 68                              | 14             | 82             |
| (30.8%)                                                      | (6.3%)                         | (37.1%)        |
| Did know                                                      | 64                              | 75             | 139            |
| (29.0%)                                                      | (33.9%)                         | (62.9%)        |
| Total                                                         | 132                             | 89             | 221            |
| (59.7%)                                                      | (40.3%)                         | (100.0%)       |

A Chi-Square test of independence was performed, and result was significant $\chi^2 (1) = 29.16, p < .05$. This indicated that there was an association between knowing someone and/or having a friend who engages in NSSI before and after starting college. According to the figure, 69.2% of the participants reported having a friend or knowing
someone who engaged in NSSI. The number of known friends or acquaintances who engaged in NSSI decreased after participants started college (62.9% before, 40.3% after).

Further, a 2x2 crosstab analysis was conducted to garner information regarding participants who engaged in NSSI about the prevalence rate for number of friends or acquaintances who engage in NSSI before and after they commenced college. Results are presented in Table 5.

Table 5.

<table>
<thead>
<tr>
<th>Did not know</th>
<th>Did know</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did not know</td>
<td>14 (19.7%)</td>
<td>3 (4.2%)</td>
</tr>
<tr>
<td>Did know</td>
<td>19 (26.8%)</td>
<td>35 (49.3%)</td>
</tr>
<tr>
<td>Total</td>
<td>33 (46.5%)</td>
<td>38 (53.5%)</td>
</tr>
</tbody>
</table>

A Chi-Square test of independence was significant $\chi^2 (1) = 11.56, p = .001$. Of the participants, 80.3% of them either had friends or knew someone who engaged in NSSI. The prevalence rate for knowing someone of having a friend decreased by nearly 20% after starting college (76.1% before college and 53.5% after college). Thus,
participants tend to have less friends or acquaintances who engage in NSSI while transiting to college.

**Question 3.** Do self-esteem (SE), state anxiety (SA), trait anxiety (TA), and biological sex explain the predictive relationship in current NSSI occurrence among undergraduate college students?

The research hypothesis is that the likelihood of someone engaging in NSSI after commencing college is related to TA, SA, SE, and biological sex. In order to test this hypothesis, a logistic regression analysis was conducted. The results are presented in Table 6.

Table 6.

*Logistic Regression Results for Trait Anxiety, State Anxiety, Self Esteem, and Biological Sex in Predicting Current NSSI Occurrence*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp (β)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-3.367</td>
<td>2.48</td>
<td>1.837</td>
<td>1</td>
<td>.175</td>
<td>.035</td>
</tr>
<tr>
<td>Trait Anx</td>
<td>.033</td>
<td>.027</td>
<td>1.505</td>
<td>1</td>
<td>.220</td>
<td>1.034</td>
</tr>
<tr>
<td>State Anx</td>
<td>.27</td>
<td>.023</td>
<td>1.407</td>
<td>1</td>
<td>.236</td>
<td>1.027</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>-.017</td>
<td>.046</td>
<td>.139</td>
<td>1</td>
<td>.709</td>
<td>.983</td>
</tr>
<tr>
<td>Sex (1)</td>
<td>-.124</td>
<td>.368</td>
<td>.114</td>
<td>1</td>
<td>.736</td>
<td>.883</td>
</tr>
<tr>
<td>Hosmer-Lemeshow</td>
<td>7.45</td>
<td>8</td>
<td>.488</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nagelkerge $R^2$</td>
<td>.135</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Trait Anx= trait anxiety, State Anx= state anxiety, Self-Esteem= self-esteem, sex= biological sex
According to the results, Variance inflation factor (VIF) values for biological sex (1.02), state anxiety (SA, 2.85), trait anxiety (TA, 3.37), and self-esteem (SE, 3.34) were within normal limits. This indicated no perfect multicollinearity. Overall, results indicated that the predictive model was a good model $\chi^2(4) = 19.70, p < .05$ in comparison to the null model. Additionally, Hosmer-Lemeshow goodness of fit test results yielded that the model was a good fit for the data, $\chi^2 (8) = 7.45, p > .05$. However, even though the model was a good fit for the data and the variables included in the model explained nearly 14% of the variation in the dependent variable, these variables were not any different than the null model without the variables included. Including TA, SA, SE, and biological sex did not significantly explain the predictive relationship on current NSSI occurrence. As a result, there is no need to include TA, SA, SE, and biological sex in the model. In fact, due to the significance and the goodness-of-fit of the model, it was determined that one or more of the variables in the model could explain the predictive relationship in current NSSI occurrence among undergraduate college students.

An exploratory analysis was conducted in order to examine whether any of the variables in the model significantly explain the predictive relationship on current NSSI occurrence. In order to accomplish this, a logistic regression Wald forward method was utilized. The results are presented in Table 7.
Table 7.

*Logistic Regression Forward: Wald Results for Trait Anxiety, State Anxiety, Self-Esteem, and Biological Sex in Predicting Current NSSI Occurrence*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp (β)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-4.024</td>
<td>.716</td>
<td>31.584</td>
<td>1</td>
<td>.000</td>
<td>.018</td>
</tr>
<tr>
<td>Trait Anx</td>
<td>.061</td>
<td>.015</td>
<td>15.866</td>
<td>1</td>
<td>.000</td>
<td>1.063</td>
</tr>
<tr>
<td>Hosmer-Lemeshow</td>
<td></td>
<td></td>
<td>4.922</td>
<td>7</td>
<td>.670</td>
<td></td>
</tr>
<tr>
<td>Nagelkerge $R^2$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.119</td>
</tr>
</tbody>
</table>

Notes: Trait Anx= trait anxiety score

Results lend support that overall the model was significant, $X^2 (1) = 17.27, p < .05$. In addition, the Goodness-of-fit Hosmer-Lemeshow test yielded $X^2 (7) = 4.92$ and was not statistically significant ($p > .05$). This suggested that the model was indeed a good fit for the data. According to the Wald statistics among all study variables included, only TA was a significant predictor for current NSSI occurrence, $X^2 (1) = 15.86, p < .05$. Nearly 12% of the variation is NSSI occurrence is explained by TA. Additionally, the odds of someone engaging in NSSI are positively related to TA scores ($p < .05$). In other words, for every increase in TA score, the odds of engaging NSSI are estimated to increase by 1.063 times. Thus, the higher the TA score, the higher the chance a participant will engage in NSSI.
**Question 4.** Do self-esteem (SE), trait anxiety (TA), and biological sex explain the predictive relationship in lifetime NSSI occurrence among undergraduate college students?

The research hypothesis is that the likelihood of someone engaging in NSSI after commencing college is related to TA, SE, and biological sex. In order to test this hypothesis logistic regression analysis was conducted. The results are presented in Table 8.

Table 8.

*Logistic Regression Results for Trait Anxiety, Self-Esteem, and Biological Sex in Predicting Lifetime NSSI Occurrence*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp (β)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-.110</td>
<td>1.986</td>
<td>.003</td>
<td>1</td>
<td>.956</td>
<td>.896</td>
</tr>
<tr>
<td>Trait Anx</td>
<td>.023</td>
<td>.021</td>
<td>1.167</td>
<td>1</td>
<td>.280</td>
<td>1.023</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>-.052</td>
<td>.038</td>
<td>1.867</td>
<td>1</td>
<td>.172</td>
<td>.949</td>
</tr>
<tr>
<td>Sex (1)</td>
<td>.090</td>
<td>.303</td>
<td>.089</td>
<td>1</td>
<td>.765</td>
<td>1.095</td>
</tr>
<tr>
<td>Hosmer-Lemeshow</td>
<td></td>
<td></td>
<td>4.754</td>
<td>8</td>
<td>.783</td>
<td></td>
</tr>
<tr>
<td>Nagelkerge $R^2$</td>
<td></td>
<td>.095</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Trait Anx= trait anxiety score, Self-Esteem= self-esteem score, sex= biological sex
According to the results, Variance inflation factor (VIF) values for biological sex (1.02), trait anxiety (TA, 3.37), and self-esteem (SE, 3.34) were within normal limits. This indicated no perfect multicollinearity. Overall, results indicated that the predictive model was a good model \(X^2(3) = 15.54, p < .05\) in comparison to the null model. Furthermore, the Hosmer-Lemeshow goodness of fit test results yielded that the model was a good fit for the data, \(X^2(8) = 4.75, p > .05\). However, even though the model was a good fit for the data and the variables included explained nearly 9% of the variation in the dependent variable, none of the variables in the model significantly explained the predictive relationship in NSSI occurrence. This means that including TA, SE, and biological sex did not significantly explain the predictive relationship in NSSI occurrence. Hence, it can be concluded that there is no need to include TA, SE, and gender in the model to explain the variation in the dependent variable. In fact, due to the significance and the goodness-of-fit of the model, it was determined that one or more of the variables in the model could explain the predictive relationship in lifetime NSSI occurrence among undergraduate college students.

Exploratory analyses were conducted in order to examine whether any of the variables in the model significantly explain the predictive relationship in lifetime NSSI occurrence. In order to accomplish this, a logistic regression Wald forward method was utilized. The results are presented in Table 9.
Table 9.

*Logistic Regression Forward: Wald Results for Trait Anxiety, Self-Esteem, and Biological Sex in Predicting Lifetime NSSI Occurrence*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp (β)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>1.964</td>
<td>.743</td>
<td>6.981</td>
<td>1</td>
<td>.008</td>
<td>.018</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>-.086</td>
<td>.024</td>
<td>13.426</td>
<td>1</td>
<td>.000</td>
<td>.917</td>
</tr>
<tr>
<td>Hosmer-Lemeshow</td>
<td></td>
<td></td>
<td>1.64</td>
<td>7</td>
<td>.977</td>
<td></td>
</tr>
<tr>
<td>Nagelkerge R²</td>
<td></td>
<td></td>
<td>.088</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Self-Esteem = self-esteem score

Results lend support that overall the model was significant, $X^2 (1) = 14.23, p < .05$. In addition, the Goodness-of-fit Hosmer-Lemeshow test yielded $X^2 (7) = 1.64; p > .05$. This suggested that the model was a good fit for the data. According to the Wald statistics among all study variables included, only SE was a significant predictor for NSSI occurrence $X^2 (1) = 13.42, p < .05$. Additionally, the odds of someone engaging in NSSI is negatively related to SE scores ($p < .05$). In other words, for each point increase in SE score, the odds of engaging in NSSI decreases from 1.00 to .917. That also means that each score increase in SE is associated with 8% decrease in the odds of NSSI engagement. Thus, the results showed that having higher SE decreases the odds of engaging in NSSI.
**Question 5.** What is the correlation between lifetime NSSI frequency, current NSSI frequency, self-esteem (SE), state anxiety (SA), trait anxiety (TA), interpersonal NSSI functions, and intrapersonal NSSI functions among college students who engage in NSSI?

The fifth research question examined whether there was a correlation between lifetime NSSI frequency, current NSSI frequency, SA, TA, SE, interpersonal function, intrapersonal function, and biological sex. In order to test the research question, bivariate correlation analysis was conducted. Results related to this analysis are given in Table 10.

Table 10.

*Correlations Among Major Study Variables*

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SA</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>TA</td>
<td>.758**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>SE</td>
<td>-.775**</td>
<td>-.742</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>lifetimeNSSI</td>
<td>.020</td>
<td>.011</td>
<td>-.101</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>currentNSSI</td>
<td>.088</td>
<td>.060</td>
<td>-.077</td>
<td>.879**</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>interpersonal</td>
<td>-.134</td>
<td>-.126</td>
<td>.189</td>
<td>-.108</td>
<td>-.089</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>intrapersonal</td>
<td>.038</td>
<td>.083</td>
<td>-.047</td>
<td>-.045</td>
<td>-.035</td>
<td>.681**</td>
</tr>
</tbody>
</table>

Notes: SA= state anxiety score, TA= trait anxiety score, SE= self-esteem score, lifetimeNSSI= NSSI frequency before and after college, currentNSSI= NSSI frequency after college, interpersonal= interpersonal functions, intrapersonal= intrapersonal functions

*p<.05 ** p< 0.01 level ( 2-tailed)
A Pearson $r$ data analysis revealed that among other correlations, lifetime NSSI ($M = 167.63, SD = 489.90$) and current NSSI ($M = 67.21, SD = 201.70$) had the highest positive correlation. This result indicated that having higher lifetime NSSI frequency is related to having higher current NSSI frequency. Further, interpersonal functions ($M = 12.28, SD = 11.17$), and intrapersonal functions ($M = 13.40, SD = 7.92$) did not significantly correlate with any other study variables, but positively correlated with each other. Lastly, SE ($M = 29.56, SD = 6.90$) only negatively correlated with TA ($M = 45.09, SD = 12.66$) and SA ($M = 44.46, SD = 12.99$). Based on these results, it can be said that having higher levels of self-esteem is associated with decreased anxiety traits and levels.

**Question 6.** What are common functions of NSSI endorsed by college students who do and do not engage in NSSI?

The sixth research question investigated which NSSI functions were preferred by participants who engage in NSSI and which functions are preferred by those who do not engage in NSSI by descriptive statistics. NSSI functions were rated in a 3-point Likert scale as “not true, not sure, and true” for others and “not relevant, somewhat relevant, and very relevant” for self. A dichotomous variable was created for each NSSI function. For others section “not sure” was used as first variable, and second variable was generated by combining “not sure and true” scales as one category. For self section, “not relevant” was used as first variable, and second variable was generated by combining “somewhat relevant and very relevant” as one category. The aim of creating a new dichotomous variable was to examine whether participants perceive these aforementioned reasons as functions. After creating this variable descriptive analysis were conducted. The results in relation to NSSI behaviors for participants who engage in NSSI about their NSSI
methods were presented in Table 11. Further, results related to others’ NSSI behaviors by participants who do and do not engage in NSSI were presented in Table 12.

Table 11.

*Common NSSI Function Descriptive Statistics for NSSI Group*

<table>
<thead>
<tr>
<th>Functions</th>
<th>For self (N=71)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>Affect regulation</td>
<td>65</td>
</tr>
<tr>
<td>Self-punishment</td>
<td>51</td>
</tr>
<tr>
<td>Anti-dissociation</td>
<td>51</td>
</tr>
<tr>
<td>Marking distress</td>
<td>51</td>
</tr>
<tr>
<td>Self-care</td>
<td>50</td>
</tr>
<tr>
<td>Interpersonal boundaries</td>
<td>42</td>
</tr>
<tr>
<td>Interpersonal influence</td>
<td>41</td>
</tr>
<tr>
<td>Toughness</td>
<td>41</td>
</tr>
<tr>
<td>Anti-suicide</td>
<td>39</td>
</tr>
<tr>
<td>Sensation seeking</td>
<td>39</td>
</tr>
<tr>
<td>Autonomy</td>
<td>32</td>
</tr>
<tr>
<td>Revenge</td>
<td>28</td>
</tr>
<tr>
<td>Peer bounding</td>
<td>25</td>
</tr>
</tbody>
</table>
Table 12.

*Common NSSI Function Descriptive Statistics for People Who Engage in NSSI*

<table>
<thead>
<tr>
<th>Functions</th>
<th>For others</th>
<th>NonNSSI (N=150)</th>
<th>NSSI (N=71)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n    &amp; %</td>
<td>n    &amp; %</td>
<td></td>
</tr>
<tr>
<td>Affect regulation</td>
<td>139  &amp; 92.7</td>
<td>70   &amp; 98.5</td>
<td></td>
</tr>
<tr>
<td>Self-punishment</td>
<td>139  &amp; 92.7</td>
<td>69   &amp; 97.1</td>
<td></td>
</tr>
<tr>
<td>Anti-dissociation</td>
<td>137  &amp; 91.3</td>
<td>70   &amp; 98.5</td>
<td></td>
</tr>
<tr>
<td>Anti-suicide</td>
<td>135  &amp; 90.0</td>
<td>63   &amp; 88.7</td>
<td></td>
</tr>
<tr>
<td>Marking distress</td>
<td>134  &amp; 89.3</td>
<td>67   &amp; 94.3</td>
<td></td>
</tr>
<tr>
<td>Sensation seeking</td>
<td>132  &amp; 88.0</td>
<td>59   &amp; 83.0</td>
<td></td>
</tr>
<tr>
<td>Self-care</td>
<td>131  &amp; 87.3</td>
<td>68   &amp; 95.7</td>
<td></td>
</tr>
<tr>
<td>Interpersonal influence</td>
<td>129  &amp; 86.0</td>
<td>65   &amp; 91.5</td>
<td></td>
</tr>
<tr>
<td>Interpersonal boundaries</td>
<td>128  &amp; 85.3</td>
<td>62   &amp; 87.3</td>
<td></td>
</tr>
<tr>
<td>Toughness</td>
<td>125  &amp; 83.3</td>
<td>62   &amp; 87.3</td>
<td></td>
</tr>
<tr>
<td>Autonomy</td>
<td>119  &amp; 79.3</td>
<td>54   &amp; 76.0</td>
<td></td>
</tr>
<tr>
<td>Revenge</td>
<td>116  &amp; 77.3</td>
<td>55   &amp; 77.4</td>
<td></td>
</tr>
<tr>
<td>Peer bounding</td>
<td>84   &amp; 56.0</td>
<td>46   &amp; 64.7</td>
<td></td>
</tr>
</tbody>
</table>

According to the Table 12, affect regulation was the leading reason to engage in NSSI for participants in NSSI and non-NSSI group both for other and self; followed by self-punishment and anti-dissociation/feeling generation reasons. The least preferred reasons for NSSI engagement were autonomy, revenge, and peer bounding for both group. The only major difference was in terms of anti-suicide reasons. Participants in the non-NSSI group thought it was the fourth leading reason for others to engage in NSSI,
while the NSSI group though it was the seventh leading reason for others and ninth leading reason for themselves. These results indicate that participants who engage and who do not engage in NSSI think that people who engage in NSSI do so to regulate their emotions and punish themselves, more than taking revenge or bonding with their friend group.

When all these reasons were put in the distinct categories, interpersonal (n= 141, 94%) and intrapersonal functions (n= 142, 94.7%) were nearly equally preferred as functions by participants who do not engage in NSSI. Participants who engage in NSSI reported similar results for interpersonal (n=70, 98.6%) and intrapersonal (n= 70, 98.6%) reasons. In contrast, when they reported their personal reasons to engage in NSSI they reported higher percentages intrapersonal (n=68, 95.8%) reasons than interpersonal (n = 63, 88.7%) reasons. Thus, participants who engage in NSSI had different views on NSSI functions for themselves and others.

**Question 7.** Are there differences between what functions are endorsed by two groups: (1) college students who engage in NSSI and (2) college students who do not engage in NSSI?

A continuous variable of interpersonal and intrapersonal NSSI functions was calculated by summing up the related subscale scores on the functions section of the instrument. The seventh question examined the differences between groups in terms of their NSSI functions. Based on how the data was collected, there were no participants in the Functions for Self section. Thus, the groups could be compared in terms of Functions for Others. An independent samples t-test was conducted in order to examine whether the NSSI group and the non-NSSI group were associated with statistically significantly
different means for interpersonal and intrapersonal functions. The results are presented in Table 13.

Table 13.

*Results of Test of Between Subjects Differences on NSSI Functions*

<table>
<thead>
<tr>
<th>Groups</th>
<th>nonNSSI</th>
<th>NSSI</th>
<th>95% CI</th>
<th>t</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>LL</td>
<td>UL</td>
<td>t</td>
</tr>
<tr>
<td>Functions</td>
<td>M</td>
<td>SD</td>
<td>n</td>
<td></td>
<td></td>
</tr>
<tr>
<td>for others</td>
<td>M</td>
<td>SD</td>
<td>n</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interper</td>
<td>20.1</td>
<td>9.2</td>
<td>149</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intraper</td>
<td>17.6</td>
<td>7.1</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSSI</td>
<td>22.7</td>
<td>11.0</td>
<td>71</td>
<td>-5.4</td>
<td>.20</td>
</tr>
<tr>
<td>Intraper</td>
<td>19.9</td>
<td>6.1</td>
<td>71</td>
<td>-4.1</td>
<td>-.42</td>
</tr>
<tr>
<td>NSSI</td>
<td>-4.1</td>
<td>-.42</td>
<td>-2.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: NSSI= non-suicidal self-injury, Interper= Interpersonal function, Intraper= Intrapersonal functions, LL= Lower level, UL= Upper level, *p < .05

The assumption of homogeneity of variances was tested and satisfied via Levene’s $F$ test. The results for interpersonal and intrapersonal functions were presented as; $F(2, 216) = 2.43$, $p = .120$ and $F(2, 217) = 1.094$, $p = .297$. According to the $t$ test results, the mean differences on interpersonal functions for others in the non-NSSI group and in the NSSI group was not statistically significant $t(218) = -1.828$, $p = 0.069$. Therefore, participants in the NSSI group and the non-NSSI group think similarly that people engage in NSSI due to interpersonal reasons.

In contrast, the independent $t$-test revealed that the average intrapersonal functions for others was significantly higher for the NSSI group than the non-NSSI group, $t(219) = -2.305$, $p = 0.022$. We can be 95% confident that the true difference
between these two means is CI = [-4.194, -0.4254]. Cohen’s $d$ is estimated at .32, which is a small effect based on Cohen’s (1992) guidelines. Therefore, participants in the NSSI group think differently than their counterparts in the non-NSSI group in terms of intrapersonal reasons for others. Even though this difference was statistically significant, it was a small effect, so it should be interpreted with caution.

**Supplementary analysis.** In order to have more information for whether or not the NSSI group differs in terms of functions for self and others, a repeated measures one-way ANOVA was conducted.

The Maunchly test results yielded significant results, $(X^2 (5) = 2.42, p < 0.5)$ which indicated the assumption for sphericity was not met. It can be said that there were significant differences between the variance of difference. Thus, the Greenhouse-Geisser was utilized in order to correct degrees of freedom. The results revealed that there was a statistically significant effect for functions $F (1.94, 135.8) = 32.25, p < .05$.

According to the repeated measures ANOVA test results, the mean scores for NSSI functions (interother, intraother, interself, intraself) were statistically significant for NSSI group. Post-hoc test with a Bonferonni adjustment revealed that the NSSI group had higher scores on interpersonal functions for others ($M = 22.7, SD = 11.0$), while having higher scores on intrapersonal functions for self ($M = 13.4, SD = 7.9$). Similarly, they had lower scores on interpersonal functions for self ($M = 12.2, SD = 11.1$) but higher scores on intrapersonal functions for others ($M = 19.9, SD = 6.1$).

Therefore, it can be concluded that there was a significant difference between NSSI functions. Thus, a post-hoc test was conducted in order to investigate which of
these functions differ among each other. A pairwise comparison test is presented in Table 14.

Table 14.

Results of Pairwise Difference on NSSI Functions for NSSI Group

<table>
<thead>
<tr>
<th>(I) factor</th>
<th>(J) factor</th>
<th>Mean Diff (I-J)</th>
<th>SE</th>
<th>Sig.</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>2.83*</td>
<td>.97</td>
<td>.030</td>
<td>.17</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>10.45*</td>
<td>1.55</td>
<td>.000</td>
<td>6.24</td>
</tr>
<tr>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>9.32*</td>
<td>1.48</td>
<td>.000</td>
<td>5.29</td>
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<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>-2.83*</td>
<td>.97</td>
<td>.030</td>
<td>-5.48</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>-10.45*</td>
<td>1.55</td>
<td>.000</td>
<td>-14.65</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>-9.32*</td>
<td>1.48</td>
<td>.000</td>
<td>-13.35</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>-7.62*</td>
<td>1.44</td>
<td>.000</td>
<td>-11.55</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>-7.62*</td>
<td>1.44</td>
<td>.000</td>
<td>-11.55</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>-1.12</td>
<td>.97</td>
<td>1.00</td>
<td>-3.76</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>6.49*</td>
<td>.93</td>
<td>.000</td>
<td>3.95</td>
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<tr>
<td>3</td>
<td>4</td>
<td>1.12</td>
<td>.97</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: 1= interpersonal function for other, 2= intrapersonal function for others, 3= interpersonal functions for self, 4= intrapersonal function for self
Adjustment for multiple comparisons: Bonferroni.

* * p = .05
According to the Table 14, interpersonal functions for others were statistically significantly different than intrapersonal functions for others, interpersonal functions for self, and intrapersonal functions for self. Additionally, the highest mean difference was observed between interpersonal functions for self followed by intrapersonal functions for self.

Similarly, intrapersonal functions for others was significantly different than interpersonal functions for others, interpersonal functions for self, and intrapersonal functions for self. The highest mean differences was observed with interpersonal functions with self followed by intrapersonal functions for self. In contrast interpersonal functions for self and intrapersonal functions for self did not significantly differ from each other. Visual plots were presented in Figure 3.

![Figure 3: NSSI Functions Mean Distribution for NSSI and nonNSSI Group](image)
The NSSI functions for self is related to intrapersonal reasons, while for others these functions were related to interpersonal reasons. Due to the magnitude of the mean differences, it can be said that participants in NSSI group believe that their reasons for NSSI engagement is personal while social for others.

Summary

In this chapter, results of the analyses for statistical assumptions and research questions were presented. Results from the first research question indicated that nearly one-third of the participants reported NSSI engagement. Moreover, NSSI engagement was higher before starting college than after commencing college.

Results from the second research question showed that more than half of the participants knew someone or had a friend who engaged in NSSI throughout their lives. In terms of before and after commencing college, results yielded that there were more people who engaged in NSSI before commencing college than after commencing college.

Research question three and four investigated the predictive relationship of anxiety (SA), trait anxiety (TA), self-esteem (SE) and biological sex on the existence or absence of lifetime and current NSSI. Results from the third research question revealed SA, TA, SE and biological sex were not significant predictor of NSSI occurrence during college. However, when variables were investigated one by one, TA scores showed significant results. This was indicative of higher scores of TA was associated with current NSSI occurrence. According to the fourth research question results, TA, SE, and biological sex did not significantly explain the predictive relationship in lifetime NSSI occurrence. Further analysis indicated that among all other variables only SE scores were
negatively related to lifetime NSSI occurrence. That means higher scores of SE decreased the likelihood of lifetime NSSI occurrence.

Concerning the fifth research question, there were statistically significant correlations between TA, SA, and SE; however, none of these variables statistically significantly correlated with either lifetime NSSI frequency or current NSSI frequency.

The sixth research question investigation indicated that affect regulation, self-punishment, and anti-distress/ feeling generation were the leading NSSI functions among the NSSI and non-NSSI engaging groups. Results from the seventh question showed no differences related to NSSI functions for others between the NSSI group and non-NSSI group. However, participants in the NSSI group reported different NSSI function preferences for themselves and for others. For self, intrapersonal functions were leading while for others, interpersonal functions were preferred by individuals who engage in NSSI.

A discussion of these results is presented in the following chapter. Moreover, implications, limitations, and suggestions for future research will be discussed.
Chapter 5: Summary, Discussion, and Conclusions

Introduction

In the following chapter, the results of the data analyses for the study’s research questions will be presented. The outline of this chapter is the summary of the study, a discussion of the findings, implications, limitations, and future research recommendations. The study’s findings will be expanded to further the understanding of NSSI behavior among undergraduate college students. Based on the research findings, theoretical, practical, and clinical implications will be presented. Limitations of the study as well as future research ideas will be discussed.

Summary of the Study

For this study, a purposeful sample was used; participants were selected from general education courses in a university in the Midwest. The final sample of two hundred and twenty one undergraduate students with different majors provided usable data for this study.

For this study, seven research questions were developed:

Question 1: What is the prevalence of NSSI reported by undergraduate college students about themselves a) before commencing college, b) while in college?

Question 2: What is the prevalence of NSSI reported by undergraduate college students about their friends or acquaintances a) before commencing college, b) while in college?

Question 3: Do self-esteem, state anxiety, trait anxiety, and biological sex explain the predictive relationship in current NSSI occurrence among undergraduate college students?
**Question 4:** Do self-esteem, trait anxiety, and biological sex explain predictive relationship in lifetime NSSI occurrence among undergraduate college students?

**Question 5:** What is the correlation between lifetime NSSI frequency, current NSSI frequency, self-esteem, state anxiety, trait anxiety, interpersonal NSSI functions, and intrapersonal NSSI functions among undergraduate college students who engage in NSSI?

**Question 6:** What are common functions of NSSI endorsed by undergraduate college students who do not engage in NSSI?

**Question 7:** Are there differences between what functions are endorsed by two groups: (1) undergraduate college students who engage in NSSI and (2) undergraduate college students who do not engage in NSSI?

Questions one and two were answered utilizing the results from descriptive analysis. In order to answer question one, a 2x2 cross tab was created with NSSI before commencing college and NSSI after commencing college categorical variables. A similar procedure was used to answer question two by generating a 2x2 cross tab for number of friends known before and after commencing college categorical variables.

Questions three and four were answered by using the results from logistic regression analysis. To answer question three, trait anxiety (TA), state anxiety (SA), self-esteem (SE), and biological sex were entered as covariates in a binary logistic regression model. The aim was to investigate whether these variables could explain the predictive relationship in current NSSI occurrence. The same procedure was followed to answer question four, eliminating SA from the model. In order to answer question four, TA, SE,
and biological sex were used as covariates in a binary logistic regression model to examine if these variables could explain the predictive relationship in lifetime NSSI occurrence.

Research question five was answered using results from a correlation analysis between lifetime NSSI frequency, current NSSI frequency, TA, SA, SE, interpersonal functions, and intrapersonal functions. The results from a descriptive analysis were used to answer question six. In order to accomplish this task, NSSI functions were counted in terms of their favorability by the participants. As a result of this frequency task, the leading perceived and actual reasons for NSSI were investigated.

Finally, to answer question seven, an independent samples $t$ test results was used. Groups were compared in terms of interpersonal and intrapersonal functions for others because participants in non-NSSI group lacked scores in interpersonal and intrapersonal functions for self. Once significant results were found between NSSI function, a repeated measures one-way ANOVA was performed to examine pairwise differences on NSSI functions in the NSSI group.

**Discussion of the Findings**

After the analyses were completed, it was found that the mean age for participants in the NSSI group was nearly 20 (ranged from 18 to 26), and this result was fairly consistent with previous research reporting on college students (Glenn & Klonsky, 2010). Furthermore, with regard to age, the findings of the current study indicated that the mean age of onset to engage in NSSI was 12. Even though this result was lower than previous research, it was still relatively close to the research findings indicating that the age of onset to engage in NSSI was thirteen (Glenn & Klonsky, 2009; 2010b; 2011), or fourteen
(Aizenman & Jensen, 2007; Klonsky, 2011; Muehlekmamp & Gutierrez, 2007; Weinberg & Klonsky, 2012), and fifteen (Nixon et al., 2008). This result expanded the understanding that individuals start engaging in NSSI at earlier ages, which is supportive of higher prevalence rates of NSSI in adolescents.

There is contradiction in the literature regarding biological sex and NSSI engagement. The current study did not find any differences between males and females in terms of NSSI engagement rate. It was congruent with some studies of college students that indicated that engaging in NSSI was not associated with being male or female (Aizenman & Jensen, 2007; Bjärred et al., 2012; Gollust et al., 2008; Gratz, 2001; Gratz et al., 2002; Gleen & Klonsky, 2010; Hasking et al., 2008; Klonsky, 2011; Whitlock et al., 2006). On the other hand, results from current study contradicted findings from other studies that showed that being female did correlate with engaging in NSSI (Hoff & Muehlenkamp, 2009; Muehlenkamp et al., 2013; Wilcox et al., 2012). The result was also consistent with other findings citing there is no biological sex difference in relation to NSSI engagement among adolescents (Hilt et al., 2008; Laye-Gindhu & Schonert-Reichl, 2005; Lundh, Karim & Quilisch, 2007). Taken together, it can be said that studies of college students and adolescents revealed that there are inconsistent research findings in literature as with regards to biological sex. These inconsistencies might be the result of using clinical versus nonclinical samples in the studies, having predominant biological sex representation in the studies, and different roles NSSI behaviors play between males and females. The current research reiterated that biological sex is not associated with NSSI engagement. However, absolute certainty is elusive, so further research is still needed for solid conclusions.
An interesting result was found in the current study with regards to common NSSI behaviors among undergraduate college students. In the literature, the majority of the research found that cutting was the most preferred NSSI method. In contrast, current research results revealed that the most common NSSI behavior was interfering with wound healing. This result was congruent with Gollust et al.’s (2008) and Andover et al.’s (2005) study findings of nonclinical college students; however, the current study showed a much higher percentage by approximately fifty percent. On the other hand, the result contradicted other research findings reporting cutting as a favored NSSI method (Cawood & Huprich, 2011; Glenn & Klonsky, 2010a; Glenn & Klonsky, 2011; Gratz, 2001; Gratz et al., 2002; Heath et al., 2008; Muehlenkamp et al., 2013; Victor, Glenn, & Klonsky, 2012). Additionally the results were not congruent with research finding reporting scratching (Whitlock et al., 2006), banging (Glenn & Klonsky, 2009; Glenn et al., 2011), hair pulling (Glenn & Klonsky, 2011), and picking skin (Aizenman & Jensen, 2007) as refereed NSSI methods among college students. Even though nearly half of the participants in the current study favored one NSSI method, banging, cutting hair pulling, starching, and burning were relatively highly endorsed by 38%, 36.6%, 33.8%, 21.2%, and 19.7% of the college students, respectively. This inconsistency might be attributable to instrumentation. Some of the instruments in previous studies did not provide variety of NSSI behaviors, but instead asked for the principle NSSI method. The current research provided the important information that cutting was not the most preferred NSSI method, unlike commonly-held beliefs and some prior research studies.

The results in the current study indicated that the majority of the participants engaged in NSSI while they were with others. This result contradicted the previous
research findings that participants engage in NSSI while alone (Glenn & Klonsky, 2009; Heath et al., 2008; Klonsky & Olino, 2008). This finding is important because it is the first known research result indicating that being alone is not a requirement to engage in NSSI. Previous research proposed that individuals do not disclose their NSSI behavior; on the other hand, current findings yielded that NSSI can be a social event that takes place with the presence of others. Based on research results, NSSI may be an imitable behavior, especially given that individuals engage in NSSI with others similar to them or to fit in. NSSI might be perceived as a help-seeking signal (Muehlenkamp, 2009).

Results in regards to pain indicated that majority of the participants sometimes feel pain but not all the time which is consistent with previous research (Nock & Prienstein, 2005; Nock et al., 2006). As for the time elapse between NSSI engagements, it was found that nearly half of the participants contemplate for a day before reengaging in NSSI. These results were not in line with previous research findings (Nock & Prienstein, 2005) indicating that individuals do not think for long periods of time before acting on NSSI. Previous research findings proposed that the more pain an individual feels during NSSI engagement, the longer the time required to reengage. The current study duplicated these results. Moreover, the results for whether participants wanted to stop engaging in NSSI were unique. Up to this point, there is no known research in the literature that has explored the desire for disengaging in NSSI; this result should have important clinical implications. According to the findings of the current study, the majority of the participants who engaged in NSSI wanted to stop this behavior, suggesting further research at this topic is needed. Taken together, these results indicated a classification criteria for individuals who engage in NSSI. These are people who engage
in NSSI behavior most of the time with others, sometimes feel pain, contemplate for longer times to engage in NSSI, and want to stop engaging in NSSI.

**Research question one.** What is the prevalence of NSSI reported by undergraduate college students about themselves a) before commencing college, b) while in college?

The aim of the current research was to examine the NSSI prevalence rate before and after commencing college among undergraduate college students.

Concerning the NSSI prevalence rate before college, it was found that approximately one-third of the participants (N = 71) reported engaging in NSSI before starting college. Dissimilar to the previous findings, the rate was higher, indicating a nearly 25% prevalence rate for nonclinical high school students (Hilt et al., 2008a; Hilt, et al., 2008b; Laye-Gindhu & Schonert-Reichl, 2005; Lundh et al., 2007; Muehlenkamp & Gutierrez, 2004, 2007; Ross & Heath, 2002) and 40% for clinical adolescents (Kumar, Pepe, & Steer, 2004). This may be due to having a small sample size, or attributable to life stage and/or age. At adolescence, individuals go through several developmental, physical, psychological, and emotional changes (Bjarehed et al., 2012). They might develop unhealthy coping strategies in order to deal with these changes.

Walsh (2012) indicated that individuals who engage in NSSI during adolescence maintain this behavior in their early adulthood. The current study supported this opinion, even though the NSSI prevalence rate after commencing college was lower than the rate before commencing college. The current study did not specify a time frame for after commencing college, unlike previous research. It asked participants whether or not they engage in NSSI after commencing college without being specific. There is no known
research in the literature that utilized this approach. Thus, the results were compared to the previous research investigating NSSI engagement among college students within the 12 months post-college. Similar rates were echoed in current study, showing NSSI engagement rates at 20% (Serras et al., 2010). On the other hand, the results were inconsistent with other research that reported a higher NSSI prevalence rate among college students in the post-collegiate 12 months (Hasking et al., 2008; Wilcox et al., 2012). This inconsistency might be due to definitional issues regarding time frame. The current research contributed data for post-collegiate NSSI rates by providing a longer time frame rather than limiting them for the twelve months after commencing college.

Taken before and after commencing college prevalence, this study found that the lifetime NSSI prevalence rate was 32%. This finding was higher in comparison to some studies (Gleen & Klonsky, 2009; Gleen & Klonsky, 2010; Glenn & Klonsky, 2011; Muehlenkamp et al., 2013; Whitlock, Eckenrode, Silverman, 2006); on the other hand, it was closer to other research findings (Cawood & Huprich, 2011; Gratz, 2001; Gratz, Conrad, Roemer, 2002) that sampled college students. The majority of the previous research focused either on high school or college students. There were no known studies that collected data about NSSI prevalence for both before and after commencing college. Thus, these results add to the body of literature for comparing before and after college behaviors related to NSSI.
**Research question two.** What is the prevalence of NSSI reported by undergraduate college students about their friends or acquaintances a) before commencing college, b) while in college?

According to the research findings, more than half of the participants either had a friend or knew someone who engaged in NSSI throughout their lives. This finding was important since there are a limited number of studies that examine these factors. The findings of the current study confirmed previous research that investigated the role of social learning on NSSI engagement among college students (Heath et al., 2009; Muehlenkamp et al., 2008); however, the current study found higher percentages of these social factors. Findings further revealed that the percentage for having a friend or knowing someone was higher before commencing college in comparison to after commencing college. It is expected that there would be a higher percentage before college due to high NSSI prevalence during adolescence. Results were in agreement with previous research indicating NSSI engagement and the number of known friends had an association among adolescents (Nock & Prienstein, 2005; Prinstein, Heilbron, Guerry, Franklin, Rancourt, Simon, Spirito, 2010).

It was further investigated whether having a friend or knowing someone has an association with lifetime NSSI engagement. The results were consistent with previous research but found higher rates for lifetime NSSI engagement for college students (Heath et al., 2009; Muehlenkamp et al., 2008). The results indicated participants who reported engaging in NSSI also reported having higher numbers of friends or acquaintances who engage in NSSI. Observation can be a leading factor for self-injury, and more specifically, social learning. If a behavior is rewarded and appraised or helps others to fit
in certain groups, it can be perpetuated. According to Walsh (2012), the chances of engaging in NSSI increases through role modeling and social learning. Moreover, being directly or indirectly exposed to NSSI engagement correlates to increased chances of engaging in NSSI among college students. It can also be concluded that individual who engage in NSSI might be more likely to select friends who also engage in NSSI and identify with them. Hence, having a friend or knowing someone who engages in NSSI may not only be indicative of higher NSSI engagement but also social grouping. Even so, it is possible that individuals who engage in NSSI might have perceptions, but not knowledge about others and their NSSI engagement. It also can be said that NSSI can be perceived as socially unacceptable behavior; this perception might lead individuals to hide their NSSI behavior. Thus, that perception may lead them to provide inaccurate information that interferes with the study results.

There was an association between NSSI engagement and having a friend or knowing someone who engages in NSSI for before and after commencing college, according to the current study. However, the rates of having a friend or knowing someone who engages in NSSI decreased after commencing college, along with NSSI prevalence. Thus, it can be said that NSSI could also be used as a coping mechanism, instead of a way to fit in with peer group. Conceivably, therefore, individuals may not share their NSSI behaviors with others. This study added to the body of literature arguing that there is a potential association between having knowledge about others’ NSSI behaviors and personal NSSI engagement among undergraduate college students.
**Research question three.** Do self-esteem, state anxiety, trait anxiety, and biological sex explain the predictive relationship in current NSSI occurrence among undergraduate college students?

Hypothesis three proposed that there will be no difference between SA, TA, SE, and biological sex in explaining the predictive relationship in current NSSI occurrence. This hypothesis was supported by the research results. For the current study, SA, TA, SE, and biological sex were not significant predictors in explaining the predictive relationship in current NSSI occurrence among undergraduate college students. However, results indicated that aggregated, these variables were able to explain a small amount of variation in current NSSI occurrence. This may be because these variables act as one predictor due to the high associations between them. Exploratory analysis results indicated that among other variables, TA was the only significant predictor in explaining the predictive relationship in current NSSI occurrence among undergraduate college students. SA, SE, and biological sex were not significant predictors for current NSSI occurrence. This may be the result of too small of a sample size to detect their impacts as well as not utilizing clinically sound instruments for TA, SA, and SE.

Taken together, these results yielded that anxiety, self-esteem, and biological sex can play a role in NSSI engagement. More specifically, having trait anxiety was related to the odds of NSSI engagement. Thus, undergraduate college students who tend to have anxious tendencies are more inclined to engage in NSSI. This finding was congruent with previous study results by Andover et al. (2005) and Hoff and Muehlenkamp (2009) that showed participants in the NSSI group had higher scores in trait anxiety. Any variability could be because state anxiety symptoms were not present at the time of taking the
survey. Furthermore, the results were consistent with other research findings indicating that nonclinical college students who engage in NSSI tend to have higher scores on anxiety assessments (Glenn & Klonsky, 2009; Golloust et al., 2008; Klonsky & Olino, 2008) as well as results from a clinical sample (Weinberg & Klonsky, 2012). On the other hand, the result contradicted some previous research reporting anxiety was not a predictor for NSSI engagement (Glenn & Klonsky, 2011) among college students. Even though current research sample was undergraduate college students, the results regarding anxiety and NSSI engagement was in agreement with nonclinical adolescents (Ross and Heath, 2002) and military recruits (Klonsky et al., 2003). In sum, even though clinically sound anxiety instrument was not utilized, the current study solidified the positive correlation between trait anxiety and NSSI engagement, in the midst of the existing literature’s inconsistent findings.

**Research question four.** Do self-esteem, trait anxiety, and biological sex explain predictive relationship in lifetime NSSI occurrence among undergraduate college students?

Hypothesis four proposed that there will be no difference between TA, SE, and biological sex in explaining the predictive relationship in lifetime NSSI occurrence. This hypothesis was supported by the research results. TA, SE, and biological sex were not significant predictors in explaining predictive relationship in lifetime NSSI occurrence among undergraduate college students. However, results further indicated that the together these variables were able to explain a small amount of variation in lifetime NSSI occurrence. Similarly to the previous analysis, this finding suggests that these variables act as one variable in explaining the variation due to having high associations between
them. The exploratory analysis results indicated that among other variables, SE was the only significant predictor in explaining predictive relationship in lifetime NSSI occurrence among undergraduate college students. On the other hand, TA and biological sex were not significant predictors for lifetime NSSI occurrence. This finding could be the result of too small of a sample size to detect their impacts.

Taken together, these results yielded that anxiety, self-esteem, and biological sex can play a role in lifetime NSSI engagement. More specifically, self-esteem was related to likelihood of NSSI engagement; lower self-esteem may increase the probability of being a member of the NSSI group. The current study found that having a higher self-esteem score decreases the chances of engaging in NSSI. The results were congruent with Aizenman et al.’s (2007) study findings, which found that self-esteem was a significant predictor of NSSI engagement among college students as well as Cawood et al.’s (2011) study results showed college students who engage in NSSI had lower self-esteem scores. Additionally, the results were congruent with previous research that sampled high school students (Laye-Gindhu et al., 2005; Lundh et al., 2007; Tattnel et al., 2013). Thus, it can be said that negative impacts of self-esteem had an influence on NSSI occurrence among undergraduate college students. Caution is needed when interpreting these results, however, since none of the studies concluded a negative association between self-esteem and NSSI.
Research question five. What is the correlation between lifetime NSSI frequency, current NSSI frequency, self-esteem, state anxiety, trait anxiety, interpersonal NSSI functions, and intrapersonal NSSI functions among undergraduate college students who engage in NSSI?

The correlation analysis results yielded several associations between study variables. There are a limited number of previous studies that investigated correlations between lifetime NSSI frequency, current NSSI frequency, TA, SA, SE, interpersonal functions, and intrapersonal functions among undergraduate college students. According to study results, lifetime NSSI frequency and current NSSI frequency were highly related with each other, such that an increase in one variable also corresponds to an increase in the other. This finding was similar to other research in which lifetime NSSI frequency was associated with current NSSI frequency (Glenn & Klonsky, 2011). The only difference between the current research and the previous research was the time frame to define current NSSI. Current research did not limit current NSSI to 12 months as in previous research, but instead provided a longer time frame.

Similar to previous research, the current study found that lifetime NSSI frequency was not associated with anxiety among undergraduate college students (Glenn & Klonsky, 2011). This result was important in that unlike the majority of the previous research, there was no association found between NSSI frequency and anxiety. Thus, future research should further investigate this correlation. Interpersonal and intrapersonal functions were found to positively correlate with each other, similar to other research findings conducted utilizing college students (Klonsky & Glenn, 2009). Caution is required since the research question utilized NSSI frequency not NSSI occurrence. The
results were also consistent with other research sampling nonclinical adolescents (Nock & Prinstein, 2004; Nock & Prinstein, 2005) and clinical adolescents (Lloyd-Richardson et al., 2007; Nock & Prinstein, 2004), in which interpersonal (social) and intrapersonal (automatic) functions were also correlated. Moreover, the data showed that lifetime NSSI frequency was not correlated with interpersonal NSSI functions, consistent with previous research findings (Glenn & Klonsky, 2011).

On the other hand, some findings were inconsistent with previous research in the relevant literature. For instance, the data indicated that lifetime NSSI frequency and self-esteem did not correlate with each other, which was dissimilar to Cawood and Huprick’s (2011) study results. Moreover, according to previous research, anxiety was found to be associated with interpersonal and intrapersonal functions (Klonsky & Glenn, 2009); however, the data indicated otherwise. Finally, unlike other research, the current study yielded no association between lifetime NSSI frequency and intrapersonal NSSI functions (Glenn & Klonsky, 2011).

State anxiety and trait anxiety had a positive linear relationship based on study findings, which was consistent with previous research that showed state and trait anxiety were positively correlated among college students (Spielberger, 1983). Individuals who encountered dangerous situations and perceived them as threatening tended to have increased state anxiety. This analysis suggests that answering a questionnaire related to NSSI could trigger negative emotions and increase anxious tendencies. According to the study results, state anxiety, trait anxiety and self-esteem were negatively associated, indicating that individuals who are high in self-esteem are less likely to have anxiety traits.
**Research question six.** What are common functions of NSSI endorsed by undergraduate college students who do not engage in NSSI?

The current study replicated previous research for common NSSI functions. Based on the findings, affect regulation was the leading reason to engage in NSSI, which corresponds to studies that investigated common NSSI functions among college students (Glenn et al., 2011; Klonsky, 2009; Klonsky & Glenn, 2009; Muehlenkamp et al., 2013). Additionally, even though the current study utilized undergraduate college students, the results were congruent with other research among clinical adolescents (Brown et al., 2002; Nock & Prienstein, 2004; Weinberg & Klonsky, 2012) and nonclinical adolescents (Laye-Gindhu & Schonert-Reichl, 2005; Scoliers et al., 2009) that showed that affect regulation was the most favored reason for individuals to engage in NSSI. Thus, participants might not have certain adaptive skills needed to deal with their negative emotions, so they engage in NSSI. It is plausible that individuals engage in NSSI impulsively when they have overwhelming feelings or when they are not able to regulate these emotions. The sensation individuals get from NSSI might be rewarding for them to engage it again.

Based on current study findings, the second leading reason for NSSI was self-punishment. This result corresponded to previous research (Hoff & Muehlenkamp, 2009; Klonsk, 2007; Klonsky & Glenn, 2009; Muehlenkamp et al., 2013) sampling college students. Similar findings were echoed utilized nonclinical adolescents (Laye-Gindhu & Schonert-Reichl, 2005; Scoliers et al., 2009; Turner et al., 2012) and clinical adolescents (Nixon et al., 2002; Nock & Prienstein, 2004). These results might be due to self-derogation, in which participants purposefully direct their negative emotions towards
themselves. Although current research did not explore risk factors for NSSI engagement, it is proposed by several researchers that aversive childhood experiences may lead individuals to engage in NSSI to get revenge and punish themselves for what happened to them (Ferrara, Terrinoni, & Williams, 2012; Walsh, 2012). It was further found that the third preferred reason for NSSI engagement was anti-dissociation, which was consistent with Klonsky’s (2007) proposal, that generating feeling was the third most common NSSI function. This NSSI function was also preferred by both nonclinical adolescents (Laye-Gindhu & Schonert-Reichl, 2005) and clinical adolescents (Nock & Prienestein, 2004). On the other hand, this finding contradicted some previous research of clinical female clients that argued feeling generation was the leading reason for NSSI engagement (Brown et al., 2002). In sum, the results of current study confirmed the majority of previous research for the most leading NSSI functions in literature.

**Research question seven.** Are there differences between what functions are endorsed by two groups: (1) undergraduate college students who engage in NSSI and (2) undergraduate college students who do not engage in NSSI?

The research hypothesis for question seven was that there were no differences between the NSSI group and the non-NSSI group in terms of NSSI functions. The two groups were compared on perceived functions for others, since participants in non-NSSI did not engage in self-injurious behaviors. Thus, the research hypothesis was partially supported with results showing that groups differed in intrapersonal functions but not interpersonal functions for others. Participants in NSSI and non-NSSI groups thought that the function of NSSI was social, rather than personal. Based on these results, NSSI is perceived as socially reinforced behavior by both individuals who engage in NSSI and
those who do not engage in NSSI. This result is important, since there is no known study in the relevant literature that explores perceived reasons for people who engage in NSSI. Current research added to the body of knowledge, even though further investigation is required.

Within the supplementary analysis, NSSI group differed in terms of NSSI functions for self and others. Previous research has only addressed functions for self, with no known research on NSSI functions for others. Even though current results were supported by some studies, other findings were inconsistent. The current study found that intrapersonal functions were preferred for self by undergraduate college students who engage in NSSI. This is congruent with other research findings, (Nock & Prinstein, 2004) even though the participants were high school students. However, the results contradicted other research that found college students preferred interpersonal functions (Heath et al., 2009; Glenn & Klonsky, 2011; Muehlenkamp et al., 2013) for their NSSI engagement. Other conflicting research sampled nonclinical adolescents (Laye-Gindhu & Schonert-Reichl, 2005; Lloyd-Richardson et al., 2007; Scoliers et al., 2009), clinical adolescents (Nock & Prinstein, 2004) and adults (Brown, et al., 2002).

Interpersonal function data may have resulted from the assumption that NSSI behaviors were reinforced by others, sustaining engagement. However, individuals who engage in NSSI think that their behaviors are personally reinforced. Intrapersonal functions perhaps alleviate negative emotions or create an emotion. Even though research found that individuals who engage in NSSI due to intrapersonal functions do so while they are alone (Klonsky & Glenn, 2009), the current study found that the majority of the participants engaged in NSSI when others are around, citing intrapersonal functions.
Even though intrapersonal functions were reinforced by external sources, individuals who have personal reasons engage in NSSI while others are present. This result supported the proposal that individual who engage in NSSI are not generally alone, and use intrapersonal functions. Moreover, it was proposed that individuals who contemplate between NSSI acts tend to prefer interpersonal functions (Nock & Priensteins, 2005). However, the current study result indicated otherwise, reporting that more participants in the NSSI group had longer elapse time and preferred intrapersonal functions.

Further, the results yielded that participants who engage in NSSI had different opinions about their personal reasons and others’ reasons. According to the results, participants thought that other individuals engage in NSSI due to social reasons; on the other hand, theirs were derived from personal reasons. This result is intriguing insofar as the leading reasons to engage in NSSI were related to intrapersonal issues, i.e. affect regulation or self-punishment. On the other hand, based on their perceptions, others engage in NSSI for interpersonal reasons. They may think that for others, gathering reinforcement from others is more important. The difference between their perceptions might be attributable to social norms theory. According to this theory, individuals perceive their behaviors/attitudes different than others (Perkins, Meilman, Leichliter, Cashin, & Presley, 1999). It can be due to the fact that individual who engage in NSSI want to justify their behavior by underestimating others’ behaviors as such for them others do not engage in NSSI as a result of personal reasons. According to them, it might be reasonable for them to engage because they have intrapersonal reasons to do so. On the other hand, others engage in NSSI just to influence others or to be accepted by others.
It is interesting that the individuals in NSSI group reported different functions for self and others even though the sequence of NSSI functions were similar in both groups.

Implications

**Theoretical implications.** The results of current study have some important theoretical implications, which should help us better understand the phenomenon, especially given the lack of a cohesive theoretical approach to NSSI. There is not one theory can explain the etiology, course, and continuity of NSSI. However, there are several models that attempt to clarify NSSI from biological, psychological, and social perspectives. For instance, Walsh’s (2012) “biopsychosocial” model offers environmental, biological, cognitive, affective, and behavioral perspectives (p.59) while Nock and Prinstein (2004) and Klonsky and Glenn (2009) offered a functional model for NSSI which includes automatic/intrapersonal and social/interpersonal.

Biological aspects of the model include neurobiology and the pain threshold (Walsh, 2012). The current study did not investigate biochemistry or hormonal differences in individuals who engage in NSSI versus those who do not. An important contribution of the current study is that it extends the current knowledge regarding pain and NSSI association. There are limited studies concerning the relationship between pain level and NSSI. According to a comprehensive review done by Osuch and Payne (2009), individuals who engage in NSSI tend to have diminished pain thresholds, and they do not feel pain during the act. The current study partially supported this proposal that participants in NSSI group reported not always feeling the pain during the act. Hence, it can be said that the current research provided intriguing evidence in relation to pain perception and NSSI association among nonclinical population.
Cognitive aspects of NSSI were explored by the current research. According to Walsh (2012), cognitive dimensions include the interpretation of an event and self-created thoughts. Based on current research, the second leading function endorsed by participants was self-punishment. Self-punishment can be seen as a way to deal with aversive thoughts by engaging in self-destructive behaviors. Ferrara, Terrinoni, and Williams, (2012) and Walsh (2012) said that self-punishment might derive from aversive childhood experiences as a result of self-hatred and irrational thought about self. Furthermore, authors indicated that individuals may utilize any destructive behaviors as a way to punish themselves. Thus, the current research supported the idea that NSSI can be related to cognitive distortions. Additionally, the current research investigated the notion of self-esteem and added to the existing body of knowledge that self-derogation might related to self-esteem and self-criticism.

Findings in this study also lend support to affective dimensions of an NSSI model as well as functional model. The affective dimensions of NSSI are closely related to cognition (Walsh, 2012). The instrument used in this study provided evidence that NSSI is associated with negative emotions that participants reported emotion regulation was their primary function. In addition, generating emotions were supported by study results. Hence, the current study also lends support to automatic/intrapersonal functions, such as regulating and creating emotions (Klonsky & Glenn, 2009; Nock & Prinstein, 2004). Furthermore, interpersonal functions of functional model was supported that participants think others engage in NSSI due to social reasons. Even though the study yielded significant results, further research is needed to enumerate the role of social learning on NSSI engagement among adolescents and college students. Although current study
provided sufficient evidence to support theoretical models of NSSI, future research is required to explore different dimensions of these models.

**Clinical implications.** Based on the findings, this study can further provide important clinical implications for counselors while counseling college students who engage in NSSI.

The current study did not find any gender differences in terms of NSSI engagement among undergraduate college students. This result contradicted the majority of previous research, with significant implications. NSSI, specifically cutting, has historically been proposed as a female coping strategy. In contrast, results showed NSSI engagement is not anticipated in females. Thus, counselors who work with females who engage in NSSI should take care not to make such assumptions, and they need to be intentional about asking male clients regarding NSSI engagement. Additionally, clients should not be treated based on Borderline Personality Disorder (BPD) perspective (Klonsky & Olino, 2008; Selby et al., 2012). Even though NSSI is one of the symptoms of this disorder, some of the clients do not meet the necessary criteria. According to some authors, NSSI is, however, associated with other co-occurring psychological disorders, for instance eating disorder, depression, and anxiety (Craigen & Milliken, 2010; Selby et al., 2012; Trepal, 2010). According to the findings, anxiety—more specifically, trait anxiety—was a significant predictor for engaging in NSSI. Individuals who tended to have anxiety traits had a high probability to maintain NSSI engagement. Thus, counselors should be cautious when working with clients who engage in NSSI, focusing treatment approaches on decreasing anxiety symptoms. Moreover, anxiety may also be predictive of how individuals perceive their self-injurious behaviors. Hence, implementing
cognitive interventions into treatment to reverse distorted self-loathing thoughts with respect to the self and NSSI behavior may be beneficial. This approach may also increase self-esteem, thereby decreasing the likelihood of NSSI engagement.

Affect regulation, self-punishment, and anti-dissociation were the leading functions for NSSI engagement. Individuals might utilize NSSI in order to regulate their emotions if they lack healthy coping strategies. They might also channelize exuberated negative emotions toward the self to punish themselves for early experiences. Moreover, NSSI can be used as a way to generate emotions, even if the behavior results in pain. Counselors can help clients to learn skills to recognize, define, and label their feelings as an alternative. The inability to express elevated negative emotions might lead to overt behavioral expression. Additionally, self-hatred might lead individuals to engage in NSSI as well as numbness. They need to be taught coping strategies; for instance, using verbal expressions instead of behavioral ones. Clients may benefit from evidence-based treatment approaches that can be implemented in order to teach them healthy emotion regulation strategies. Further, individuals who engage in NSSI might lack skills to address the issues they encounter. When working with these clients, problem-solving approaches should be utilized in order to teach them constructive ways to address their problems.

Counselors should pay close attention to the role of NSSI behaviors in an individual’s life as opposed to focusing on clinical diagnosis or assessing risk factors. NSSI functions need to be evaluated thoroughly in order to garner insight into the role of NSSI in an individual’s life. This assessment would be the most crucial element of conceptualizing a treatment plan.
It is argued that if a behavior is learned within the society, it is maintained via environmental reinforcement (Kamen, 2009). According to the results of the current study, individuals engage in NSSI in the presence of others. The social context of the behavior needs to be assessed in order to rule out pervasive effects of social environment and peer influence. Counselors ought to be aware of social learning while conducting group counseling for individuals who engage in NSSI.

**Limitations and Recommendations for Future Research**

**Limitations.** Despite significant results, there are several limitations of the current study in relation to research design, instrumentation, and sampling. Due to lack of randomization and the exploratory nature of the research, it cannot be said that there is a causal relationship between independent and dependent variables. Additionally, even though there are associations between anxiety, self-esteem, and NSSI, there is no causality. The relation between variables may be due to unseen moderating or mediating variables. Also, several covariates in this study were not included (i.e. emotional regulation, childhood maltreatment, depression), each of which might be related to NSSI engagement.

Another limitation of the study was related to the logistic regression assumptions. One assumption of the logistic regression was that the observations needed to be independent. However, this assumption was not controlled for, due to the data collection procedure.

There are several sampling limitations for this study. Even though logistic regression was utilized in current study, sample size was determined by following multiple regression procedure. Participants were selected from one Midwestern
university. Although it was necessary to conduct the NSSI research on college students, the sampling was limited by the convenience of surveying a relatively uniform population. Thus, results cannot be generalized to a universal college student body. Further, participation in the study might have been impacted by bias, either positively or negatively.

Concerning instrumentation limitation, the instrument contained ambiguous language which may have obscured the difference between friends and acquaintances. ‘Knowing someone’ could have been interpreted differently by participants, as meaning ‘having a close relationship’ or as ‘being familiar with someone,’ as in public figures in the media or celebrities. The results might be inflated as a result of this shortcoming. Moreover, the data was collected based on self-report, and relied on retrospective experiences for some individuals. The NSSI incidents might be under or over reported as a result of the self-report. Even though interfering wound from healing was the preferred NSSI method in this study, participants may have interpreted the behavior differently. It may have been that participants did not think of wound interference as a way to regulate emotions or to punish oneself, but instead a habitual ‘harmless’ behavior. Finally, some questions used NSSI frequency, but others used dichotomous NSSI variable. As a result, there might be a loss of information on questions that used the dichotomous variable; for instance, in some research questions, “not true” and “not sure” as well as “relevant” and “somewhat relevant” were combined.

Despite these aforementioned limitations, the results of current study had important implications for understanding and prevention of NSSI among college students. The following section will address future research recommendations.
Recommendations for future research. The current research aimed at exploring the prevalence of NSSI, and the predictive roles of anxiety, self-esteem, and biological sex on current and lifetime NSSI occurrence among undergraduate college students. Thus, some psychological and social risk factors were not included in this study. Many previous studies have investigated the predictive relationship between childhood aversive experiences, emotions regulation, impulsivity, and BPD; however, in this study, these variables were not tested. It is possible that there were moderating or mediating effects of these relevant variables, even though they were not assessed. Thus, it would be beneficial to explore the association between these variables and study variables in greater depth. Further, longitudinal studies are required in order to investigate the etiology and associated risk factors of NSSI, especially in different cultures. Additional research is required in order to investigate the common characteristics of NSSI across various cultures.

In this study, only anxiety was assessed over other diagnostics. Future research is needed that includes additional diagnoses correlates, i.e. depression, obsessive-compulsive disorders, and personality disorders. Additionally, even though anxiety and self-esteem were found to be associated with NSSI occurrence, these variables explained a small variation. With respect to small variation, it is plausible that anxiety and self-esteem is required to be assessed using clinically sounded instruments. Thus, continuing research should include a larger sample size, examining the predictive natures of these variables on NSSI occurrence.

Moreover, individuals might know the reasons why they engage in NSSI; however, they might not be aware of the role it plays in their lives. For example, they
may engage in NSSI to regulate elevated negative emotions without realizing their behavior may help them get closer to others. Future research is required to distinguish between reasons and functions for starting to engage and maintain NSSI behaviors. In order to accomplish this, individuals who currently engage in NSSI could be utilized as a sample to obtain accurate information regarding their reasons. Additionally, future research may employ interviews in order to collect data on clinical variables, as well as daily logs used to track emotional states of self-injurers. Future research can include a social desirability scale, in order to examine whether participants responded in a socially acceptable manner. It can also help discover under- and over-representation, preventing research bias.

Finally, it was found that some of the individuals either stopped or started engaging in NSSI after they commenced college. Further research is needed to distinguish whether there are differences between individuals who stopped NSSI versus those who maintained NSSI for an extended period of time according to different variables, i.e. risk factors, and help-seeking behaviors. Moreover, cultural characteristics of individuals might play role in NSSI engagement; hence, cultural context and common characteristics across cultures need to be explored. Additionally, the social context of NSSI needs to be further explored. The results indicated that being with others was prevalent among self-injurers while engaging in NSSI, though the characteristics of people present for NSSI behavior could be investigated in future research.

**Conclusions**

This exploratory study aimed at investigating NSSI prevalence among undergraduate college students as well as the perceived functions of NSSI on their lives.
Contrary to expectations, being female was not associated with NSSI engagement. It was found that NSSI was more common before college than after commencing college among undergraduate college students. Further, among other variables only TA was a significant predictor on current NSSI occurrence. That means having higher TA scores increase odds of current NSSI occurrence. Additionally, having lower SE scores increase chances of lifetime NSSI occurrence. Concerning NSSI functions for others, intrapersonal functions were preferred by both individuals who engage in NSSI and those who do not engage in NSSI. The findings of this study lend support to biological, psychological, cognitive, environmental, affective, and functional models of NSSI. Accordingly, the findings of current study added to the current body of knowledge with regard to NSSI and provided important implications for counseling undergraduate college students who engage in NSSI.
References


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Appendix A: Inventory of Statements about Self-Injury (ISAS)

Inventory of Statements about Self-Injury (ISAS) – Section I. Behaviors

This questionnaire asks about a variety of self-injurious behaviors. Self-injury has been defined as deliberately causing harm to one’s own body or bodily tissues. Please only endorse a behavior if you have done it intentionally (i.e., on purpose) and without suicidal intent (i.e., not for suicidal reasons).

1. Please **ESTIMATE** the number of times you have intentionally (i.e., on purpose) and without suicidal intent (i.e., not for suicidal reasons) performed each type of the following behaviors **BEFORE** you started college:

   Cutting ____     Severe Scratching ____
   Banging or Hitting Self ____     Burning ____
   ..........

2. Please **ESTIMATE** the number of people (friend or acquaintances) you knew who engage in self-injurious behaviors **BEFORE** you started college

___________________________
3. Please **ESTIMATE** the number of times you have intentionally (i.e., on purpose) and without suicidal intent (i.e., not for suicidal reasons) performed each type of the following behaviors **AFTER** you started college:

   Cutting ____  Severe Scratching ____
   Banging or Hitting Self ____  Burning ____
   ........

4. Please **ESTIMATE** the number of people (friend or acquaintances) you knew who engage in self-injurious behaviors **AFTER** you started college

____________________________

*************************************************************************

* If **YOU HAVE PERFORMED** one or more of the behaviors listed above, please continue with the questionnaire. If **YOU HAVE NOT PERFORMED** any of the behaviors listed above, please go to page 7.
5. At what age did you:

First harm yourself? ______________ Most recently harm yourself? ______________

6. ..... 

7. ..... 

8. ..... 

9. .....
Instructions

This inventory was written to help us better understand the experience of non-suicidal self-injury. Below is a list of statements that may or may not be relevant to your experience of self-injury. Please identify the statements that are most relevant for you:

- Circle 0 if the statement not relevant for you at all
- Circle 1 if the statement is somewhat relevant for you
- Circle 2 if the statement is very relevant for you

**“When I self-injure, I am …”**

<table>
<thead>
<tr>
<th>Description</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. … calming myself down</td>
<td>0 1 2</td>
</tr>
<tr>
<td>2. … creating a boundary between myself and others</td>
<td>0 1 2</td>
</tr>
<tr>
<td>3. … punishing myself</td>
<td>0 1 2</td>
</tr>
<tr>
<td>4. … giving myself a way to care for myself (by attending to the wound)</td>
<td>0 1 2</td>
</tr>
<tr>
<td>5. … causing pain so I will stop feeling numb</td>
<td>0 1 2</td>
</tr>
<tr>
<td>6. …</td>
<td></td>
</tr>
<tr>
<td>7. …</td>
<td></td>
</tr>
</tbody>
</table>

39. …
Inventory of Statements about Self-Injury (ISAS) – Section II-B. Functions

Instructions

This inventory was written to help us better understand the experience of non-suicidal self-injury. Below is a list of statements to examine perceptions of why people may engage in self-injury.

• Circle 0 if you think the statement is not true
• Circle 1 if you are not sure
• Circle 2 if you think the statement is true

“When people self-injure, they are…”

1. … calming themselves down
2. … creating a boundary between themselves and others
3. … punishing themselves
4. … giving themselves a way to care (by attending to the wound)
5. … causing pain so they will stop feeling numb
6. …
7. …

Response

0 1 2
0 1 2
0 1 2
0 1 2
0 1 2
0 1 2
0 1 2
0 1 2
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0 1 2
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0 1 2
0 1 2
0 1 2
(Optional) In the space below, please list any statements that you feel would be more accurate for you than the ones listed above:

(Optional) In the space below, please list any statements you feel should be added to the above list, even if they do not necessarily apply to you:
Items Comprising Each of 13 Functions Scales

Affect Regulation – 1, 14, 27
Interpersonal Boundaries – 2, 15, 28
Self-Punishment – 3, 16, 29
Self-Care – 4, 17, 30
Anti-Dissociation/Feeling-Generation – 5, 18, 31
Anti-Suicide – 6, 19, 32
Sensation-Seeking – 7, 20, 33
Peer-Bonding – 8, 21, 34
Interpersonal Influence – 9, 22, 35
Toughness – 10, 23, 36
Marking Distress – 11, 24, 37
Revenge – 12, 25, 38
Autonomy – 13, 26, 39

Scores for each of the 13 functions range from 0 to 6.
Appendix B: Rosenberg Self-Esteem Scale (RSES)

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle SA. If you agree with the statement, circle A. If you disagree, circle D. If you strongly disagree, circle SD.

1. On the whole, I am satisfied with myself. SA A D SD
2. At times, I think I am no good at all. SA A D SD
3. I feel that I have a number of good qualities. SA A D SD
4. I am able to do things as well as most other people. SA A D SD
5. I feel I do not have much to be proud of. SA A D SD
6. I certainly feel useless at times. SA A D SD
7. I feel that I’m a person of worth, at least on an equal plane with others. SA A D SD
8. I wish I could have more respect for myself. SA A D SD
9. All in all, I am inclined to feel that I am a failure. SA A D SD
10. I take a positive attitude toward myself. SA A D SD
### Appendix C: State-Trait Anxiety Instrument (STAI)

#### Form Y-1

<table>
<thead>
<tr>
<th></th>
<th>1. I feel calm</th>
<th>2. I feel secure</th>
<th>3. I am tense</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1: Not at all</td>
<td>1: Not at all</td>
<td>1: Not at all</td>
</tr>
<tr>
<td></td>
<td>2: Slightly</td>
<td>2: Slightly</td>
<td>2: Slightly</td>
</tr>
<tr>
<td></td>
<td>3: Moderately</td>
<td>3: Moderately</td>
<td>3: Moderately</td>
</tr>
<tr>
<td></td>
<td>4: Very much</td>
<td>4: Very much</td>
<td>4: Very much</td>
</tr>
</tbody>
</table>

1. I feel calm
2. I feel secure
3. I am tense
4. 
5. 
6. 
7. 
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### Form Y-2

<table>
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<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td>21. I feel pleasant</td>
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<td>22. I feel nervous and restless</td>
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<td>40.</td>
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<td></td>
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</tbody>
</table>
Appendix D: Demographics Questionnaire

Please provide basic demographic information about yourself.

Age:

Major:

Biological Sex:

_____ Female  _____ Male

Sexual Orientation:

_____ Heterosexual  _____ Gay

_____ Lesbian  _____ Bisexual

_____ Questioning  _____ Other, please specify: ________________________

Current Relationship Status:

_____ Single, Never married  _____ Married or Partnered

_____ Separated  _____ Divorced

_____ Widowed

Racial Background:

_____ White, non-Hispanic  _____ African American

_____ Asian American  _____ Hispanic

_____ International  _____ Native American

_____ Pacific Islander  _____ Multiracial

_____ Other, please specify: __________________________________________
Appendix E: Permission Letter for STAI

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To whom it may concern,

This letter is to grant permission for the above named person to use the following copyright material for his/her thesis or dissertation research.

Instrument: **State-Trait Anxiety Inventory for Adults**

Authors: **Charles D. Spielberger, in collaboration with R.L. Gorsuch, G.A. Jacobs, R. Lushene, and P.R. Vagg**

Copyright: **1968, 1977 by Charles D. Spielberger**

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Sincerely,

Robert Most

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