

Validity and Reliability of the Non-Suicidal Self-Injury Assessment Tool (NSSI-AT): Why Use the NSSI-AT?

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Background

Most studies of NSSI in community populations of youth and adults rely on one of two measures for which at least some psychometric data are available: the Deliberate Self-Harm Inventory (DSHI; Gratz, 2001) and the Functional Assessment of Self-Mutilation (FASM; Lloyd et al., 1997). Measures intended to assess NSSI as part of a continuum of self-injurious and suicidal behavior (SITBI; Nock et al., 2007; SHBQ; Gutierrez, et al., 2001) are also used but contain a small number of items specific to NSSI. Both the DSHI and the FASM include measures intended to assess basic NSSI characteristics (specific NSSI behaviors, frequency, and severity) with the FASM assessing additional characteristics, importantly including NSSI function. These surveys have been immensely useful in establishing the presence of NSSI and in documenting basic epidemiological characteristics such as form, frequency, and function, but they provide a limited picture of the phenomenology of NSSI.

The aim of the current study is to examine the validity and reliability of the Non-Suicidal Self-Injury Assessment Tool (NSSI-AT), a web-based measure of non-suicidal self-injury for use in general, community populations for research purposes. The NSSI-AT was developed to assess basic NSSI characteristics (such as form, frequency, and function) as well as secondary characteristics (including but not limited to motivations for initiating NSSI, addictive qualities of NSSI, the contexts in which NSSI is practiced, NSSI severity, disclosure, and help-seeking). The NSSI-AT has been used in several large scale surveys (Cheng et al., 2010; Whitlock, Eckenrode & Silverman, 2006; Whitlock et al., in press), including a longitudinal study collecting data over a three year period. An examination of content, construct, convergent, and discriminant validity, as well as test-retest reliability of the NSSI-AT, is presented here.

Tool Development

The NSSI-AT was developed using a thorough review of existing academic literature, exploratory interviews with 27 young adults with NSSI experience, and 9 interviews with mental health practitioners (e.g., a pediatrician, secondary school counselor, psychiatrist, psychologist) with extensive experience working with young people who self-injure. These interviews explored NSSI onset, triggers, function, related contextual factors, co-morbidity, therapeutic experiences, and cessation. Information gleaned from these interviews helped further refine the questions and response options which comprise the NSSI-AT. The tool was piloted in a 2 college study (Whitlock et al., 2006) and refined for use in an 8 college study (Whitlock et al., in press) and related longitudinal study.

NSSI-AT Modules

| Behavior based screening question | Severity (frequency of unintended severity, medical treatment for wounds, role of drugs & alcohol) |
|---|--|
| Function (social & automatic response options) | Contexts and practice patterns (patterns in time, place, social involvement, etc.) |
| Frequency and recency (lifetime, last incident, likelihood of future incidents) | NSSI habituation & perceived life interference |
| Age of onset and cessation | NSSI disclosure (who knows, suspects, has had conversation) |
| Wound locations | NSSI treatment (formal treatment experience & efficacy) |
| Initial motivation (social, automatic, accidental response options) | Personal reflections and advice |

Method

Data collection: The *Survey of Student Wellbeing* (SSWB) was administered to a randomly selected population from 8 universities in 2006-2007 as well as to a longitudinal sample of five of these schools from 2006-2009.

Test-retest data: A random subgroup of 300 students from one of the universities was invited to participate in a follow-up administration of the SSWB (including the NSSI-AT) 4-6 weeks after the initial survey.

Measures comparison: Data comparing the NSSI-AT to basic screening items of other NSSI measures (the FASM and the DSHI) were collected from 300 individuals in the second wave of longitudinal data collection. Alternative NSSI measures were randomized in appearance before or after the NSSI-AT. Behavior-based response options in the NSSI-AT and the FASM were also randomized in hierarchy of appearance in the response option list.

Convergent & discriminant validity: In addition to NSSI items, the SSWB includes measures such as suicide-related behavior (Furukawa, Kessler, Slade, & Andrews, 2003), disordered eating (Stice, Telch, & Rizvi, 2000), trauma history, sexual partner history, use of non-medical prescription drugs, and binge drinking.

Results

Content validity. Content validity refers to the systematic examination of the test content to determine whether it covers a representative sample of the behavior domain to be measured and is deemed to possess content validity through careful selection of which items to include (Anastasi & Urbina, 1997, p. 114). Several steps were taken to assure NSSI-AT content validity including tool construction grounded in thorough review of extant theory, existing measures, and in-depth interviews with individuals with varied backgrounds and experience. The tool has been piloted with representatives of the target population willing to provide detailed feedback on content wording, representativeness, and ordering, and has found to describe NSSI experiences well.

Construct, convergent, and discriminant validity. Existing literature suggests that NSSI would be much more strongly correlated with mental health (MH) variables than with other risk taking behavior variables. Tool validity was tested by assessing the strength of a dichotomously coded version of the NSSI screening variable with a) a set of MH variables with which we would expect NSSI to be highly correlated (suicide-related behavior, disordered eating, and number of lifetime traumas), b) a set of risk taking variables with which we would expect low or no significant correlation (non-medical prescription drug use, number of sexual partners in the last year, and binge drinking), and c) other measures of NSSI (the FASM and the DSHI). Results of these associations are shown below.

| | Dichotomous NSSI | NSSI lifetime frequency |
|--|------------------|-------------------------|
| Any suicidality | .369*** | .400*** |
| Suicide ideation | .182*** | .177*** |
| Suicide attempt | .164*** | .199*** |
| Disordered eating | .226*** | .242*** |
| Number of lifetime traumas reported | .233*** | .246*** |
| Non-medical prescription drug use | .104** | .086* |
| Number of sexual partners in past year | -.004 | -.007 |
| Binge drinking | .001 | .001 |
| FASM: Dichotomous measure of NSSI† | .523*** | .548*** |
| DSHI (screening question) | .848*** | .672*** |

†This excludes three original FASM indicators (tattooing, picking at a wound, and picking at skin) since these either violated current definition of NSSI or were overly broad.

*p<.05 **p<.01 ***p<.001

More detailed analysis showed that the moderate correlation between the NSSI-AT and the FASM is due to the moderate overlap in behavior assessed by each tool. More specifically, the FASM assesses a wider array of low severity behaviors than the NSSI-AT and the NSSI-AT includes a wider array of higher severity behaviors. Correlation between the two tools when "cutting," one of the behaviors common to both and asked in a similar way, is .75; which is more in line with expectations.

Reliability. Reliability is the measure of item and tool consistency over time. As shown below, test-retest data showed strong reliability between key item measures.

| | |
|--|---------|
| Presence of NSSI† | .80*** |
| NSSI lifetime frequency | .84*** |
| Number of NSSI forms used | .84*** |
| Ever injured more severely than expected | .65** |
| Number of NSSI functions | .73*** |
| SI habituation scale | .713*** |

†Considering this was administered 4-6 weeks after baseline, we may expect a small number of new cases. Examination of the 5 discriminate cases shows 2 true new cases, 1 case of low lethality NSSI where the respondent decided to disclose in one instance and not the other, and 2 cases of true NSSI positives not disclosed at time two. Unwillingness to answer all of the NSSI questions twice may account for dishonest disclosure at time 2.

Discussion

The development of the NSSI-AT fills a void in the academic research regarding NSSI. First, NSSI and behaviors with a suicidal intent are clearly delimited with this assessment tool. The NSSI-AT is grounded on a definition of NSSI also accepted and promoted by the International Society for the Study of Self-Injury (2007), resolving much of the lack of clarity in definition that makes comparisons of findings from other tools, even regarding simple prevalence, challenging. The focus of the NSSI-AT on NON-suicidal behaviors means this tool first and foremost assesses NSSI and not suicidality; the sophistication of this tool allows researchers to screen out false positives due to conflation with suicidality while still allowing researchers to explore the relationship between NSSI and suicide. Additionally, this tool not only has modules related to basic NSSI epidemiological information, such as form, function, and frequency (which can be assessed with other NSSI measures) but is more nuanced. Thus, the NSSI-AT is able to assess NSSI characteristics lacking on other measures of NSSI, including motivations for initiating NSSI, the contexts within which NSSI is practiced, variation in NSSI severity, disclosure, and help-seeking. Finally, the breadth and depth of the NSSI-AT provide researchers with a unique opportunity to gather greatly detailed information (such as one might expect to obtain via a structured interview tool) from a large sample of individuals. This is because the web-based delivery of the NSSI-AT allows for some customization of questions and response options as a result of previous responses; display and skip logic embedded in the NSSI-AT mean detailed, nuanced questions are asked of those with pertinent experiences and are not seen by others.

Perhaps both a strength and a limitation of the NSSI-AT is its mode of delivery; this survey must be completed on-line. The skip patterns (which allow for detailed, nuanced questions and response options to be presented based on previous responses) embedded in this survey would make it cumbersome to complete in a paper-and-pencil format. However, on-line surveys represent an increasingly utilized mode of research data collection, one with which young people in particular may be comfortable sharing honest, personal information.

Due to the behavior-based items and the tool length, the NSSI-AT is not an ideal tool for use with younger populations (i.e., under high school age), nor has it been tested for use in clinical settings as a screening tool, though it may have use in this area.

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