Improving Risk Assessment with Suicidal Patients: A Preliminary Evaluation of the Clinical Utility of The Scale for Impact of Suicidality - Management, Assessment and Planning of Care (SIS-MAP)

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ABSTRACT

Although a number of suicide risk assessment tools are available to clinicians, the high levels of suicide still evident in society suggest a clear need for new strategies in order to facilitate the prevention of suicidal behaviors. The present study examined the utilization of a new structured clinical interview called the Scale for Impact of Suicidality Management, Assessment and Planning of Care (SIS-MAP). SIS-MAP ratings were obtained from a group of incoming psychiatric patients over a 6-month period at Regional Mental Health Care, St. Thomas, Ontario. A canonical discriminant function analysis resulted in a total 74.0% of original grouped cases correctly classified based on admission status (admitted or not; Wilks Lambda = .749, p< 0.001). The specificity of the scale was 78.1% while the sensitivity of the scale was 66.7%. Additionally, mean total scores on the scale were used to establish clinical cut-offs to facilitate future level of care decisions. Preliminary analysis suggests the SIS-MAP is a valid and reliable tool in determining the level of psychiatric care needed for adults with suicidal ideation.

KEYWORDS: Suicide, suicide risk, assessment, and prevention, SIS-MAP

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Suicide is a global health problem which affects more than a million people worldwide. In Canada, specifically, the suicide rate is around 11.5 per 100,000 residents, a rate equal to that of many developing countries (Statistics Canada, 2004), and the rate is even higher in the United States, an estimated 12.9 per 100,000 (Flavin & Radcliff, 2009). Worldwide, suicide is already one of the leading causes of death and the World Health Organization projects that over the coming decades suicide will become an even greater contributor to the global burden of disease (Murray & Lopez, 1996). The prevalence of suicide has many societal consequences, including lost productivity (estimated to be $11.8 billion per year in the United States; Goldsmith, Pellmar, Kleinman, & Bunney, 2002).

Kessler, Borges, and Walters (1999) report that 34 percent of individuals considered “lifetime suicide ideators” go on to make a suicide plan and that 72 percent of individuals with a suicide plan go on to make a suicide attempt. Additionally, 26 percent of people who have suicidal ideations but do not have a plan will make an unplanned attempt. These findings suggest that clear indicators do exist to aid in the detection of individuals at high-risk for suicidal behavior, and ultimately the prevention of this behavior. Although there are a good number of suicide risk assessment tools available, the high levels of suicide still evident suggest a clear need for new strategies in order to facilitate the prevention of suicidal behaviors. An important part of this process is developing assessment instruments which can successfully differentiate between individuals presenting symptoms who are at serious risk for attempting suicide and those who are not.

Current suicide risk assessment methods include measurement of suicidal intent, assessment of suicide potential and prediction of possible attempt, and assessment of suicide potential in certain disorders such as personality disorder and substance abuse (Jobes, Eyman, & Yufit, 1995). The Suicide Status Form (SSF), a prominent suicide risk assessment scale, evaluates an individual’s qualitative responses to questions regarding five main constructs: psychological pain, stress, perturbation, hopelessness, and self-hate (Jobes et al., 2004). While the SSF has proven to be a reliable and valid measure, a limitation of this scale is its narrow focus on only five constructs. Suicidality is a complex issue which has its roots in a large number of factors, internal and external to the individual. The SSF, along with most other suicide risk assessment scales, fail to capture the vast range of influences on suicide risk. Many assessment tools used to predict suicide risk focus on depressive symptoms, while ignoring the many other contributors to suicide beyond depression (e.g. Beck Hopelessness Scale; Beck & Steer, 1988).

Importantly, it has been recognized that consideration of protective factors is a necessary component of any suicide risk assessment in order to identify potential buffers against suicidal behaviors (Sanchez, 2001). The risk factors which make individuals vulnerable to suicidal behaviors may be counteracted by aspects in their lives, such as close connections with others or effective coping strategies, which produce a resilience to this potential behavior. An assessment tool that does not consider resilience factors in addition to risk factors will be missing a large part of the picture, and thus, will result in less accurate predictions.

A second problem with the suicide assessment tools currently available is the reluctance of clinicians to use them. An investigation into the current suicide risk assessment procedures among practicing clinicians found that assessment instruments were used infrequently and clinicians rated these instruments as having limited usefulness (Sanchez, 2001). This finding is unfortunate, as objective rating scales have proven to be more accurate predictors of future behavior than traditional clinical assessments, highlighting the need for objective scales that clinicians are not averse to using (Dawes, Faust, & Meehl, 1989). One reason for the current reluctance to use existing assessment scales may be the fact that existing tools do not provide clinicians with treatment meaning. An individual’s score on these assessments does not have any real implications for future treatment (Jobes et al., 2004). For a suicide risk assessment to be of value, it must provide the clinician with not just the individual’s level of risk, but also the level of care that he or she requires in order to prevent a future suicide attempt.

In order to improve current suicide risk
assessment tools by widening the focus of assessment to all aspects of an individual’s life, a new scale has been developed called the Scale for Impact of Suicidality - Management, Assessment and Planning of Care (SIS-MAP; Srivastava & Nelson, 2008). This scale is based on the idea of a balance between risk and resilience factors and incorporates factors which contribute to suicide from a wide variety of domains. A stress-diathesis model forms the theoretical context from which the scale was developed. Essentially, suicidal ideation or attempts occurs when an individual’s resilience is compromised by various risk factors, making an individual vulnerable; additionally, recent events and stressors will determine the intensity and severity of the ideation. In support of this idea, the use of a stress-diathesis model has proven useful when predicting suicidality in previous research (e.g. Hewitt, Flett, & Turnbull-Donovan, 1992).

Following from this model, the SIS-MAP was developed with consideration of the most prominent risk and resilience factors identified by 16 experts in the field (Pope & Vasquez, 2007). Sixteen experts were interviewed and asked to report the most common indicators of suicide risk they have extrapolated from their personal experience. Twenty one commonly mentioned indicators, such as previous suicide attempts, hopelessness, and clinical syndromes, were then compiled, and it was this list that was used as a base for constructing the SIS-MAP. The SIS-MAP measures an individual’s current level of risk in five different domains: biological, psychological, spiritual, social, and environmental and also includes an assessment of protective factors such as self-esteem and stability of the home environment. In this way, the SIS-MAP goes beyond the assessment tools which focus narrowly on depressive symptoms or on five main constructs to consider all of the influencing factors which converge to create suicide risk.

The domains considered in the SIS-MAP include those typically assessed in suicide risk assessment tools and are also consistent with the standards of assessment used by the National Suicide Prevention Lifeline. These include the components of suicidal desire, suicidal capability, suicidal intention, and buffers (Joiner et al., 2007). The SIS-MAP assesses all four of these components through its various subscales. Thus, the SIS-MAP is consistent with current, accepted standards of assessment as well as the opinions of experts in this field, supporting the validity of this tool. Clearly, further research will be required to assess the true validity of this measure, but the grounding of this scale in existing theory and empirical work are important steps towards creating a valid measure.

Essentially, the scale was designed as a comprehensive clinical scale for assessment of suicidality in order to better predict level of risk as well as to guide the development of a care and management plan. The current research was designed to evaluate the ability of the SIS-MAP to meet these goals. That is, the precision of the SIS-MAP in differentiating between individuals at risk for suicide and those not at risk was assessed. Suicide risk was operationalized in this study as the degree of care an individual required to prevent suicidal behaviors (i.e. inpatient hospitalization vs. outpatient care).

At the same time, the inter-rater reliability of the scale was measured to determine whether the SIS-MAP represents a consistent measure of suicidality, as opposed to current methods of observation and personal judgment. Finally, clinical cut-offs were determined using the current set of cases in order to facilitate decision-making based on the scale. To achieve these goals, fifty individuals presenting to crisis services were given the SIS-MAP and scores on the scale were compared with whether the individuals were then admitted or not. It was anticipated that the results of this research would highlight the validity and reliability of the SIS-MAP in predicting psychiatric admission, and thus would suggest its utility in suicide risk assessment and care planning.

**Method**

Individuals with suicidal ideation presenting to an outpatient crisis center were given the SIS-MAP interview as part of the triage process. The triage process involves prioritizing patients based on the severity of their condition which facilitates the ability to treat as many patients as possible based on the
resources available. Clinicians who were involved in this process for the present research included social workers, nurses, psychometrists, and psychologists. All of these individuals were trained to conduct the structured SIS-MAP interview. Using traditional assessment techniques (e.g. clinical interview), a determination was made as to whether additional follow-up was required with outpatient services or whether inpatient hospitalization was necessary. The SIS-MAP was administered by the clinicians during the triage process but was not the basis of decision-making. It should be noted that the SIS-MAP interviewers were separate from the psychiatrists who made the decisions regarding the participants’ required level of care (decisions regarding admission); in this way, information from the SIS-MAP and the outcome of interest was not contaminated by the particular administrator. After clinicians had determined the level of patient care needed, based on clinical judgment, scores on the SIS-MAP were compared to this outcome measure to determine its ability to predict risk. If accurately predictive, the SIS-MAP would represent a standardized alternative to clinical judgment as part of the triage process.

Setting

Regional Mental Health Care in St. Thomas, Ontario is a general adult mental health program in a regional psychiatric hospital serving Southwestern Ontario. It consists of 4 inpatient wards comprised of one acute care ward, and three longer-term wards dedicated to tertiary care for persistent and recurrent psychiatric illness, including schizoaffective/mood disorders, schizophrenia, and other major mental illness necessitating comprehensive and multidisciplinary treatment. Inpatients range in age from 16 to 65 years, but geriatric patients with a history of involvement with psychiatric care predating the age of 65 years are also considered for admission. Forensic services were excluded from the study due to the specialized legal criteria for hospitalization.

Participants

Participants ranged in age from 16 to 69 years old; the average age being 41 years old. There were 28 male and 22 female participants considered. The majority of patients were Caucasian and ethnocultural data was not obtained. It is estimated that the patient population likely reflects the catchment area of Ontario. Provincially, there are less than 20% visible minorities in Ontario (Statistics Canada, 2001).

Scale

The Scale for Impact of Suicidality - Management, Assessment and Planning of Care (SIS-MAP; Srivastava & Nelson, 2008) is a recently developed scale composed of 108 items. Item selection was achieved through expert criterion methodology. Sixteen experts were interviewed and asked to report the most common indicators of suicide risk they have extrapolated from their personal experience. The risk factors reported, as well as the resilience factors stated, were then compiled and it was this list that was used as a base for constructing the SIS-MAP. By including all aspects that factor into an expert clinician’s decision-making process, the SIS-MAP was intended to provide a simple, reliable way for clinicians to enhance their suicide risk assessment.

The overall scale includes 8 subscales representing the key domains for risk factors (demographics, psychological, comorbidities, family history, biological, protective factors, clinical ratings/observations, and psychosocial and environmental problems). The psychological subscale is further broken down into items assessing: ideation, management of ideation, current state of suicidality, and planning. The majority of items require checking ‘yes’ or ‘no’ based on the presence of absence of the item, with most items scored as a ‘yes’ receiving a score of 1 and items scored as a ‘no’ receiving a score of 0. Examples from the psychological domain include “Do you get ideas to hurt yourself?” and “Do you believe in seeking help for suicidal thoughts?” An example from the protective factors domain is “Have you succeeded when faced with similar life challenges?” Despite the number of items, the SIS-MAP can be administered in a relatively short period of time, usually taking approximately 20 minutes to complete.
The inter-rater reliability of the scale was assessed by videotaping a case vignette in which a therapist administers the structured interview to a mock client. Twenty clinicians were then familiarized with the SIS-MAP and were asked to score the mock client using this scale according to what they observed in the videotaped interview. The twenty clinicians included registered nurses, social workers, occupational therapists, and psychometrists. The scale was found to have moderately high inter-rater reliability, with reliability scores between 0.70 and 0.81.

After administering the SIS-MAP, an overall score can be determined by summing the subtotals for each domain. The total score is calculated by summing the subtotals for all domains except the protective factors domain, and then subtracting the subtotal for protective factors from this initial sum. Thus, the final score represents the level of risk facing an individual across their key life domains after taking into account the protective factors which work against their level of risk. It was anticipated that the use of this scoring system would allow for the collection of data in order to describe the level of symptoms in the current sample and estimate clinical cut-offs to guide admission decisions. That is, SIS-MAP scores from the individuals in the present sample who were hospitalized or who received outpatient care can be used in the future to help make level of patient care decisions.

**RESULTS**

**Correlations among Variables and Admission Status**

Whether individuals were admitted or not (admission status) was used as the outcome measure and was correlated with various predictor variables. Analyses demonstrated that admission status was correlated with subtotals in the protective domain \( r = -.333, p < .05 \), suggesting that individuals with higher levels of resilience factors were less likely to be admitted, a key assumption of the SIS-MAP. Additionally, the individual items of previous suicide attempts and the presence of psychosis were correlated with admission status \( r = .368, p < .05 \), and \( r = .321, p < .05 \) respectively. Interestingly, the domain of family history was not associated with admission status or previous suicide attempts, despite previous research that has suggested otherwise (e.g. Mittendorfer-Rutz, Rasmussen, & Wasserman, 2008).

**Classifying Individuals Using the SIS-MAP**

A canonical discriminant function analysis was conducted in order to evaluate whether SIS-MAP total scores were predictive of whether participants were admitted following a clinical interview assessing suicidal risk. The analysis resulted in a total 74.0% of original grouped cases were correctly classified (Wilks Lambda = .749, \( p < 0.001 \)). The specificity of the scale (correctly identifying individuals who did not require admission) was 78.1% while the sensitivity of the scale (correctly identifying individuals who required admission) was 66.7%. The false positive rate was 33.3% while 21.9% of cases resulted in a false negative.

Bisconer and Gross (2007) conducted an evaluation of well-known suicide risk assessment scales and a comparison of the SIS-MAP to these scales is provided in Table 1. The scales are compared based on their specificity, sensitivity, and ability to correctly classify individuals. The other scales considered are the Suicide Probability Scale (SRS) and Suicide Probability Scale – Clinical Scales (SRS-Clinical Scales; Cull & McGill, 1988), the Adult Suicidal Ideation Questionnaire (ASIQ; Reynolds, 1991), and the Beck Depression Inventory II (BDI-II; Beck, Steer, & Brown, 1996).

**Clinical Cut-Offs for Level of Care Needed**

The mean total scores on the SIS-MAP for individuals who were admitted \( (M = 23, SD = 9) \) vs. not admitted \( (M = 33, SD = 14) \) and their respective standard deviations were used to establish clinical cut-offs. Thus, it was determined that scores falling between 13 and 23 represent individuals who require outpatient follow-up but do not require admission (individuals who score less than 13 likely require no follow-up). Individuals who score above 33 on the SIS-MAP are at a serious risk of suicide and should be admitted to a psychiatric facility. Scores between 23 and 33 require clinical judgment...
to determine the level of care required.

**DISCUSSION**

The SIS-MAP was designed as a comprehensive clinical scale for assessment of suicidality in order to better predict level of risk as well as to guide the development of a care and management plan. The intent was to create a scale that clinicians would be willing to utilize in their practice by addressing the various shortcomings of existing instruments. The current research was designed to evaluate the ability of the SIS-MAP to meet these goals and the findings suggest that this tool represents a reliable and valid instrument for suicide risk assessment.

To begin with, it was determined that the scale is able to correctly classify individuals to the level of care needed in 74% of cases and has a high level of both specificity and sensitivity. An evaluation of well-known suicide risk assessment scales by Bisconer and Gross (2007) found that no single instrument predicted suicide risk without a significant amount of error. When compared to the instruments evaluated by Bisconer and Gross (2007), the SIS-MAP appears to be just as accurate as other assessment tools in the field and, importantly, has also provided Canadian norms for the scale. In the present study, level of care decision were made on the basis of clinical judgment, and the ability of the SIS-MAP to predict these decisions suggests its ability to be used as a standardized alternative to more traditional techniques.

The SIS-MAP may represent a more accurate instrument in predicting suicide risk due to the larger scope of the items as compared to many assessment tools. By including protective factors and examining risk factors across many life domains, the SIS-MAP stands to provide a more precise prediction of outcomes. Additionally, the inter-rater reliability of the scale was also demonstrated, and found to be moderate to high when comparing the scores of clinicians familiar with the SIS-MAP. The predictive ability and reliability of the SIS-MAP highlight its usefulness to the triage process. Clinicians will be able to compare an individual’s score to pre-determined norms to come to a more standardized, reliable decision. Hopefully, this would result in more individuals receiving the level of care that they require.

Importantly, feedback from these clinicians regarding use of the SIS-MAP was positive. One of the primary drawbacks of existing suicide risk assessment tools is their infrequent use by clinicians. Despite the number of items included in the SIS-MAP, the assessment can be completed in a relatively short period of time (approximately 20 minutes) and can provide clinicians with accurate predictions regarding an individual’s risk and also the level of treatment that will be required.

Unlike existing instruments which provide

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<th>SIS-MAP</th>
<th>SPS</th>
<th>SPS Clinical Scales</th>
<th>ASIQ</th>
<th>BDI-II</th>
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<td>Specificity</td>
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<td>Sensitivity</td>
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<td>Correctly Classified</td>
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<td>63.1</td>
<td>74.1</td>
<td>71.0</td>
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*Note: Comparison scale data from Bisconer and Gross (2007). Cell data in percentages.*
clinicians with a risk score but little in the way of
treatment implications, the current research has
provided clinical cut-offs in order to facilitate the
level of care decision based on SIS-MAP scores. It
was determined that individuals scoring between 13
and 23 likely require outpatient treatment and do not
require admission to a psychiatric facility. Scores
above 33, however, indicate that admission is
necessary, as the individual is at a high risk for
attempting suicide. Scores between 23 and 33 require
clinical judgment in order to determine the best
treatment option for the individual. To aid in this
process, the present research has highlighted a few
domains that are associated with admission and, thus,
may be used to inform decisions regarding level of
care.

For example, it was shown that the presence of
psychotic symptoms correlated with admission status
as well as whether the individual had attempted
suicide in the past. Thus, the clinician may consider
these variables when attempting to determine the
level of care required. Additionally, the domain of
protective factors was negatively correlated with
admission to a psychiatric facility, suggesting that
this is an important consideration when making level
of care decisions. If an individual scores highly on
the protective factors subscale then outpatient
treatment may be the most appropriate option for this
person.

Although the present results are promising, they
represent only the preliminary evaluation of this new
measure. While the SIS-MAP items were derived
using expert criterion methodology, further research
(e.g. factor analyses) could help with item analysis
and with strengthening the validity of the scale.
Additionally, further research is required to
determine the generalizability of the current findings.
The present research was limited by a small sample
size; thus, replications will be required to confirm
these results as well as to examine the cross-cultural
validity of the scale. Follow-up studies will also be
required in order to determine the ability of the SIS-
MAP to prevent suicide and to help guide care
planning. Clearly, the results of the present research
using the SIS-MAP suggest the potential utility of
this scale in a variety of contexts. Suicide risk
assessment is a wide-spread issue which extends
beyond individuals in psychiatric care. Presently,
field trials using the SIS-MAP with the Canadian
military and with an acquired brain injury population
are underway. Results from these trials, along with
further replications and applications to diverse
populations, will be able to determine the
generalizability of the SIS-MAP as well as to further
elucidate its practical and clinical validity and utility.

The SIS-MAP, and other assessment scales in
this field, are limited by the fact that most items are
answered ‘yes’ or ‘no,’ when a full picture of the
individual might require a more in-depth description
of the issues included in the assessment. In crisis
services, however, it is important to be able to make
informed decisions in a short period of time. The
SIS-MAP allows for clinicians to make quick,
informed decisions regarding admission and then,
unlike many instruments in this field, provides
clinicians with direction in terms of treatment. This
measure covers most aspects of an individual’s life,
and is in this way able to highlight the domains in
which a person requires the most care and also the
domains that may be able to provide them with
support to enhance the treatment process.

Admittedly, standardized assessments may not be
useful in all situations. There will always be
individuals for whom the standard does not fit; but
the wide range of factors considered by the SIS-MAP
provides clinicians with the ability to use their own
clinical judgment after obtaining a picture of the risk
and resilience factors an individual is faced with. The
clinical cut-off scores do not need to be used as hard
and fast rules, merely standards that guide decision-
making and may not apply to every unique
individual.

In sum, this exploratory and preliminary analysis
shows the exciting promise of the SIS-MAP as a
valid, sensitive, and specific tool for assessing
suicide risk. In addition to accurate prediction of
level of care required, it can easily be administered
by mental health clinicians and can facilitate the level
of care decision through consideration of all relevant
domains as well as through the provision of clinical
cut-offs. Importantly, it considers a wider range of
risk and protective factors than previous instruments,
providing clinicians with much more direction in
terms of treatment and care management. Clearly,
the SIS-MAP is able to distinguish amongst various clinical dispositions in suicidal patients, however, further research is required to strengthen these findings.

**References**


