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Assessment of Suicidal Risk through Clinical Scales: A Comparative Analysis of Measurement Tools and Their Effectiveness in Psychiatric Practice

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Abstract: *Suicide risk assessment is one of the critical components of mental health care, necessitating accurate, reliable, and sensitive tools to identify at-risk individuals and guide interventions. This article provides a comprehensive analysis of various clinical scales used to assess suicidal risk, exploring their psychometric properties, target populations, and practical applications. Key scales discussed include BSS, C-SSRS, SBQ-R, and SS.*

The analysis highlights the importance of integrating these tools into clinical practice to enhance early detection and management of suicidal behaviors, particularly among high-risk groups such as individuals with depression, mood disorders, adolescents, and so on.

The effective application of these assessment scales is crucial in improving mental health outcomes, emphasizing a multifaceted approach that includes mental health support, community engagement, and targeted interventions for high-risk groups. The article underscores the need for ongoing research and refinement of these tools to adapt to the evolving understanding of suicidal behavior and prevention strategies.

Keywords: *suicide risk assessment; suicidality scale; suicidal behavior prevention; suicide risk evaluation.*

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1. Introduction

Suicide risk is a multifaceted issue influenced by a combination of individual, environmental, and contextual factors. Primary risk factors are intrinsic to the individual, such as mental illnesses, which are major contributors to suicidal behavior (Patoz & Samalin, 2022). For instance, patients with major mood disorders, including depression and bipolar disorder, exhibit a higher propensity for suicide, particularly during severe depressive episodes (Rihmer et al., 2018). The COVID-19 pandemic has exacerbated physical health issues, a reason why there were many ways of relieving them through modern technologies. (Andritoi et al., 2022).

Also, the pandemic generated many mental issues, leading to increased suicide rates, especially among vulnerable groups like individuals with psychiatric disorders, the elderly, and healthcare workers (Schuck et al., 2020). Sociocultural and familial factors also play a crucial role, as the erosion of religious values and the sociological and psychoanalytical perspectives on suicide have shifted the understanding and management of suicidal behavior (García de Jalón & Peralta, 2002).

Additionally, sociodemographic, psychological, and biological factors are critical in assessing autolytic behavior, emphasising the need for comprehensive risk evaluation to prevent suicide. Specific risk indicators for suicide attempts, such as financial dependency, childhood trauma, and psychiatric comorbidities, have been identified, with poisoning being a common method among those attempting suicide (Pires et al., 2015). The phenomenon of suicide is particularly concerning among adolescents, where factors like substance abuse, psychiatric disorders, family problems, school difficulties, cognitive issues, eating disorders, and bullying are prevalent (Sousa et al., 2018). Despite a general decline in suicide rates in some regions, it remains a leading cause of death among young adults, underscoring the need for targeted prevention strategies (Gradell Brandström, Kristensson, & Olausson, 2009). Bipolar disorder patients are at a heightened risk of suicide compared to the general population and other psychiatric conditions, with neuroimaging studies suggesting structural and functional abnormalities in the prefrontal cortex as potential contributors (Nery-Fernandes & Miranda-Scippa, 2013). Overall, understanding the complex interplay of these factors is essential for effective suicide prevention, necessitating a multifaceted approach that includes mental health support, community engagement, and targeted interventions for high-risk groups.

The conceptualisation of suicide as a brain disorder has significant implications for treatment and prevention strategies. Recent research highlights the neurobiological underpinnings of suicidal behavior, suggesting that structural and functional brain alterations play a crucial role. This perspective shifts the focus from purely psychological or social explanations to include biological factors, potentially leading to more targeted interventions. The integration of neuroimaging findings with clinical approaches could enhance the effectiveness of suicide prevention efforts. Below, key aspects of this topic are explored, drawing on insights from the provided research papers.

Neuroimaging studies have identified specific brain networks associated with suicide, including the dorsal default mode, basal ganglia, and anterior salience networks. These networks are implicated in the regulation of emotions and impulse control, which are often disrupted in individuals with suicidal tendencies (Schmaal et al., 2020; Zhang et al., 2024).

Research from the ENIGMA consortium indicates that a lower surface area of the frontal pole is associated with a history of suicide attempts in young people with mood disorders. This finding suggests a potential biomarker for suicide risk, although further research is needed to fully understand its implications (Velzen, 2022; Velzen et al., 2021).

Functional MRI studies reveal that suicidal activity in mood disorder patients may be linked to cognitive-emotional deficits, particularly involving the default mode and basal ganglia networks. These deficits could underlie the impaired decision-making and emotional regulation observed in suicidal individuals (Malhi et al., 2019).

Traditional antidepressants may not be sufficient for treating suicidal depression, which may require specific interventions. Emerging treatments such as lithium, clozapine, and ketamine show promise in reducing suicide risk by targeting specific neurobiological pathways (Ballard et al., 2022).

Techniques like transcranial magnetic stimulation (TMS) and cognitive-behavioral therapies that focus on modifying brain activity and cognitive patterns are being explored as potential treatments for suicidal behavior (Ballard et al., 2022).

Understanding the neurobiological basis of suicide could lead to personalised treatment plans that consider individual brain structure and function, potentially improving outcomes for at-risk individuals (Kamimura et al., 2022).

Identifying neurobiological markers of suicide risk can facilitate early intervention, particularly in young people. This approach could prevent the progression from suicidal thoughts to behaviors (Velzen, 2022; Velzen et al., 2021).

Population-level strategies, such as limiting access to means of suicide and promoting mental health awareness, remain crucial. However, integrating neurobiological insights into these strategies could enhance their effectiveness (Menon et al., 2024).

While the neurobiological perspective on suicide offers promising avenues for treatment and prevention, it is essential to consider the complex interplay of biological, psychological, and social factors. Integrating neuroimaging findings with traditional approaches could lead to more comprehensive and effective strategies. However, challenges remain, including the need for larger, more diverse study samples and the development of interventions that are accessible and acceptable to diverse populations. As research progresses, a multidisciplinary approach that combines neurobiological insights with psychosocial interventions may offer the best hope for reducing suicide rates globally.

Suicidal risk assessment is a critical component in mental health care, requiring accurate, reliable, and sensitive tools to identify individuals at risk and to guide interventions. Various instruments and methodologies have been developed and validated to address this need. For instance, the Suicidality Scale (SS) is a robust tool created through a sustainable scale development approach, involving community input and rigorous psychometric testing, resulting in a unidimensional eight-item scale with high reliability and validity across diverse populations (Harris et al., 2023). Communication techniques also play a vital role in assessing suicide risk, with research highlighting the importance of using normalisation statements and expressions of care to facilitate discussions about suicidal ideation in clinical settings (Paulus et al., 2013). The WHO highlights the global impact of suicide, which represents 1.4% of all deaths, and emphasises the need for standardised procedures such as the PORS (Pathways of Recovery and Survival) model that systematically assesses risk factors and protective factors in psychiatric settings (Lubas & Rode, 2022). However, the ethical implications of using standardised risk assessments and the paternalistic approach of "zero-suicide" policies have been criticised, suggesting that these methods can sometimes override patient autonomy and the ethical principles of screening (Smith, 2022). Suicidal risk assessment scales are critical tools in clinical and research settings to identify individuals at risk for suicide and guide appropriate interventions. Various scales have been developed and validated to meet this need, each with unique strengths and applications.

This study aims to make a significant contribution to the field of mental health by conducting a comprehensive and comparative analysis of different clinical rating scales used in suicide risk assessment. By incorporating these validated tools into clinical practice, mental health professionals can improve the early detection and management of suicidal behavior, thereby contributing to reduced suicide rates and improved mental health outcomes. The article also emphasises the need for continued research to validate and refine the tools used for assessing suicidal risk. In a dynamic field like mental health, where the understanding of suicidal behavior is constantly evolving, the tools used must be regularly updated and validated. Ongoing research

allows for the identification of new risk factors, the improvement of existing instruments, and the development of innovative approaches to suicide prevention.

2. Methodology

This section describes the rigorous process by which different suicide risk assessment scales were selected and compared. The methodology aims to identify the most appropriate tools for assessing suicide risk to ensure effective and personalised interventions in the context of mental health. The methodology includes evaluating the psychometric properties of each scale, the target population, and clinical applicability to support informed decision-making in the choice of clinical instruments.

The rating scales were selected based on the following fundamental criteria: (1) clinical relevance. Priority has been given to scales commonly used in clinical practice. (2) Validity and reliability. Scales that demonstrated high validity and reliability were selected, as confirmed by clinical trials. In particular, Cronbach's alpha coefficient (α) was used to assess internal consistency, and only scales with values $\alpha > 0.80$ were included in the analysis. (3) Target population. Scales that apply to a broad spectrum of populations, including adolescents, adults, and patients with specific mental disorders (e.g. schizophrenia), have been included to ensure the usefulness and flexibility of the tools in various contexts. (4) Practicality of use. Each scale was evaluated according to the time it took to apply, its format (self-report or clinician administration), and its accessibility in various languages. Practicality is essential for everyday use in clinical settings with limited resources. It is important to note that the selection and comparison methodology may be limited by the availability of empirical data for some less-used scales and by cultural variability in their application.

3. Results

Various clinical scales were analysed for their effectiveness in assessing suicide risk. These scales vary in psychometric properties, target populations, and practical application. They provide clinicians with reliable methods for evaluating both the severity and frequency of suicidal ideation and behavior, thereby enabling targeted interventions.

1. The Beck Scale for Suicide Ideation – BSI (Beck et al., 1988) is a “self - self-administered questionnaire with 19 items, designed to assess the intensity of suicidal ideation. Responses for each item are scored on a scale from 0 to 2, where 0 denotes the absence of suicidal thoughts, 1 represents mild ideation, and 2 reflects severe ideation”. The total score ranges from 0 to 38, with higher scores indicating more severe suicidal ideation. BSI is widely utilised by clinicians to evaluate suicide risk and to track fluctuations in patients' suicidal thoughts throughout treatment. It is a well-validated tool, but its application requires a high level of collaboration and honesty from the patient. If patients are reluctant to express their suicidal thoughts due to stigma, the validity of the results may be compromised. The scale can also be influenced by cultural factors that affect how suicidal thoughts are expressed.

2. The Columbia-Suicide Severity Rating Scale - C-SSRS (Posner et al., 2011) is “a comprehensive assessment tool that assesses the severity and intensity of suicidal thoughts and behaviors”. This scale includes questions about the frequency, duration, and intensity of suicidal thoughts, as well as related behaviors such as suicidal plans, preparations, and attempts. “The Columbia-Suicide Severity Rating Scale (C-SSRS) has several versions, ranging from brief interviews to detailed assessments, and is widely used in research and clinical practice to identify individuals at high risk of suicide.” Although praised for its predictive validity and extensive coverage of suicidal behaviors, C-SSRS has been criticised for its tendency to overestimate suicide risk in certain populations, particularly among those who exhibit non-psychiatric symptoms or who live in

different socio-cultural contexts. Overestimating the risk can lead to unwarranted interventions or additional stress for the patient.

3. The Suicide Behaviors Questionnaire-Revised - SBQ-R (Osman et al., 2001) is “a brief instrument consisting of 4 items that assess different dimensions of suicidal behavior. Items address the frequency of suicidal thoughts, intention to act on those thoughts, threats of suicide, and the likelihood of a future suicide attempt”. The Suicide Behaviors Questionnaire-Revised (SBQ-R) is used in both general and clinical populations to identify individuals at increased risk for suicide. In addition, it serves as a tool for monitoring changes in suicidal behavior over time and provides valuable insights into risk assessment and intervention needs. It is effective for quick assessments but has been criticised for the lack of a detailed assessment of the severity of suicidal ideation. In addition, some items are formulated in a complex way, which may require further clarification, especially for people with low levels of education or cognitive impairments.

4. Beck's Hopelessness Scale - BHS (Beck et al., 1974) is a “brief instrument with a 20-item true/false questionnaire designed to assess an individual's sense of hopelessness. This scale is a key indicator of suicide risk, measuring hopelessness through three aspects: perception of the future, motivational loss, and negative expectations”. Scores on the BHS range from 0 to 20, with higher scores indicating greater hopelessness. It is widely used in both research and clinical settings to identify individuals at higher risk of suicide and to assess the impact of therapeutic interventions. Although BHS has good predictive validity, it is highly dependent on the individual's fluctuating emotional state at the time of assessment. This can lead to large variations in scores depending on the time of application, without necessarily reflecting a real change in suicide risk.

5. The Scale for Suicide Ideation – SSI (Beck et al., 1979) is an instrument developed by Aaron T. Beck to assess suicidal intentions and plans. The scale consists of 19 items, each rated on a scale from 0 to 2, where 0 indicates the absence of suicidal thoughts or intentions, 1 indicates moderate thoughts or intentions, and 2 indicates severe thoughts or intentions. SSI is primarily used in research to study factors associated with suicide risk and to monitor changes in patients' suicidal intentions throughout treatment”.

6. The Patient Health Questionnaire - 9 (PHQ-9), developed by Kroenke et al. (2001) is “an instrument used to assess depression that contains nine items, one of which specifically targets suicidal ideation. The PHQ-9, commonly used by primary care physicians, helps screen for depression, assess its severity, and track changes in symptoms over time. Patients in the primary care setting are typically administered the PHQ-9 to identify depressive symptoms and assess their intensity. Each item on the questionnaire is rated on a scale from 0 (not at all) to 3 (almost every day), giving a total score ranging from 0 to 27. Higher scores indicate more severe depression and a greater likelihood of suicidal thoughts and behaviors. Includes only one item related to suicidal ideation, which limits its ability to assess suicide risk in depth. Also, being used mostly in primary care, it may not be sensitive enough to detect suicide risk in complex cases.

7. The Reasons for Living Inventory (RFL), introduced by Linehan et al. (1983) to examine the reasons why individuals make decisions during suicidal crises. RFL focuses on understanding the protective factors that prevent individuals from acting on suicidal ideation. This inventory contains 48 items, organised into six factors: family responsibilities, concern for children, social ties, fear of suicide, faith in the future, and religious faith. Each item is rated on a scale from 1 (never) to 6 (very often). The RFL is used in both research and clinical practice to assess suicide risk factors and help develop effective suicide prevention strategies.

8. The Suicide Intent Scale (SIS), created by Beck and Herman (1974), evaluates the extent of suicidal intent following a suicide attempt or self-harming behavior. The scale consists of 15 items, divided into two categories: circumstances surrounding the attempt and the individual's emotional and cognitive state during the attempt. Each item is scored on a scale, with a maximum of two points per item, where zero represents no suicidal intent. This scale is instrumental in assessing the severity of suicidal ideation and intent.

9. The InterSePT Scale for Suicidal Thinking - ISST developed by Lindenmayer et al. (2003), is “a tool designed to evaluate suicidal thoughts in patients with schizophrenia and schizoaffective disorders. This scale consists of 12 clinician-rated items that assess the frequency, intensity, and duration of suicidal thoughts, along with related behaviors”. The ISST is employed in both research and clinical settings to identify patients with schizophrenia and schizoaffective disorders who are at heightened risk of suicide and to track the effectiveness of interventions. Is useful for patients with schizophrenia, but its applicability is limited to this specific category of patients. It also requires specialised training to be applied correctly, and the interpretation of the results can be subjective, which can lead to variations depending on the clinician.

10. The Modified Scale for Suicide Ideation - MSSSI (Miller et al., 1986) is “a revised version of the Scale for Suicide Ideation (SSI), designed to provide a more detailed assessment of suicidal intentions”. The scale includes 18 items, each rated on a scale from 0 to 3, where 0 indicates the absence of suicidal thoughts or intentions, and 3 indicates severe thoughts or intentions. The MSSSI is used in research and clinical practice to study factors associated with suicide risk and to monitor changes in patients' suicidal intentions throughout treatment.

11. The Montgomery-Åsberg Depression Rating Scale – MADRS (Montgomery & Åsberg, 1979) is a clinical assessment tool used to measure the severity of depressive episodes in patients with mood disorders. It was developed to be sensitive to changes in depression severity, making it particularly useful for monitoring treatment progress. The scale is comprised of 10 items, each rated from 0 to 6, with higher scores reflecting more severe symptoms. These items address multiple facets of depression, such as apparent sadness, reported sadness, inner tension, reduced sleep, reduced appetite, concentration difficulties, lassitude, inability to feel, pessimistic thoughts, and suicidal thoughts. The cumulative score can range from 0 to 60.

Table 1. Summary Table of Suicide Assessment Scales

Scale	Description	Psychometric Properties	Population	Time	Format	Usage	Languages	Validity Scores for Different Populations
BSI	Measures intensity of suicidal thoughts (19 items)	$\alpha = 0.89$, high validity	Adults, adolescents	10-15 min	Self-report	Clinical, research	English, others	Increased validity in adolescents and adults with severe depression; reduced sensitivity in populations with predominant anxiety symptoms
C-SSRS	Assesses severity/intensity of ideation and behavior	$\kappa = 0.87-1.00$, predictive validity	All ages	5-10 min	Clinician/self-report	Clinical, emergency, research	English, others	High sensitivity for populations with mood disorders; Risk of Overestimation in Individuals With Symptoms specific
SBQ-R	Evaluates dimensions of suicidal behavior (4 items)	$\alpha = 0.80-0.87$, validated	Adults, adolescents	5 min	Self-report	Clinical, research, screening	English, others	Low validity for individuals with reduced cognitive abilities or limited education
BHS	Measures hopelessness (20 items)	$\alpha = 0.93$, predictive validity	Adults	5-10 min	Self-report	Clinical, research	English, others	High reliability in groups with major depression; low shelf life for remission populations

SSI	Assesses suicidal intentions/plans (19 items)	$\alpha = 0.89-0.94$, high validity	Adults, adolescents	10-15 min	Clinician-administered	Research	English, others	Suitable for assessing suicidal intentions in severe depression; less effective in populations with passive tendencies
PHQ-9	Depression screening with a suicide item (9 items)	$\alpha = 0.89$, criterion validity	Adults	5-10 min	Self-report	Clinical, research, screening	English, others	Reduced validity for the evaluation of suicide in complex cases; useful in rapid screening
RFL	Assesses reasons for living (48 items)	$\alpha = 0.72-0.92$, strong construct validity	Adults	10-20 min	Self-report	Clinical, research	English, others	High validity scores for patients with moderate depression; low sensitivity to individuals with narcissistic traits
SIS	Evaluates suicidal intent post-attempt (15 items)	$\alpha = 0.95$, predictive validity	Adults	10-15 min	Clinician-administered	Clinical, research	English, others	Suitable for assessing the severity of intentions after attempts; Risk of overestimation in patients with anxiety disorders
ISST	Assesses suicidal thoughts in schizophrenia/schizoaffective	$\alpha = 0.84$, high validity	Schizophrenia patients	10-15 min	Clinician-administered	Clinical, research	English	High validity scores for patients with schizoaffective disorders; Low applicability outside this population
MSSI	Enhanced SSI for detailed assessment (18 items)	$\alpha = 0.96$, high validity	Adults, adolescents	10-15 min	Clinician-administered	Research	English, others	Increased validity for detailed assessment in severe depression; Not recommended for rapid screening
MADRS	Measures severity of depressive episodes (10 items)	$\alpha = 0.88$, sensitive to changes	Adults	10-15 min	Clinician-administered	Clinical, research	English, others	Good sensitivity to monitoring the evolution of antidepressant treatment; less effective for detecting passive suicide

4. Discussion

The effective assessment of suicide risk is paramount in mental health care, where early identification and intervention can be lifesaving. This article highlights the critical role that various clinical scales play in evaluating suicidal ideation and behaviors, offering a detailed comparative analysis of several widely used tools. These scales, including BSS; C-SSRS; SBQ-R, and SS, among others, provide clinicians with robust frameworks for assessing risk and tailoring interventions to individual needs.

The psychometric properties of these scales—such as reliability, validity, and sensitivity—are fundamental to their clinical utility. For instance, the BSS and C-SSRS are noted for their high validity and reliability, making them suitable for both clinical and research settings. The SBQ-R, with its concise format, is particularly useful for quick screenings, while the SS stands out for its rigorous development process and applicability across diverse populations.

The consistent application of these tools in clinical practice can significantly enhance the early detection and management of suicidal behaviors. Each tool's design caters to different aspects of suicidal ideation and behavior, allowing clinicians to choose the most appropriate scale based on the patient's specific circumstances and needs.

Integration of all these assessment tools into routine clinical practice is essential for comprehensive suicide prevention. These tools, such as BSS and C-SSRS, offer detailed assessments that can guide treatment planning and monitor patient progress over time. Similarly, instruments such as SBQ-R and SS serve as effective and adaptable screening tools suitable for a variety of healthcare settings, including primary care and emergency departments. These assessments not only help identify individuals or groups at risk but also facilitate effective documentation and communication of risk levels among healthcare professionals.

However, the implementation of standardised risk assessment tools needs to be approached with careful consideration of ethical issues. Policies such as the "Zero Suicide" initiative, which promotes systematic risk assessment and management, have raised concerns about the possible

erosion of patient autonomy. These assessments must be conducted in a manner that respects ethical standards and patients' rights. This includes ensuring informed consent, offering appropriate emotional support and actively involving patients in treatment decisions.

Thus, informed consent becomes an essential component. Patients must be informed about the purpose and nature of suicide risk assessments, as well as the possible implications of the results of these assessments. Evaluations should be perceived not as a control mechanism, but as a means of support and protection. Lack of adequate informed consent can lead to a loss of patient trust and a decrease in the effectiveness of interventions. There are also concerns about the potential cultural bias of assessment tools. Most suicide risk assessment scales have been developed and validated on Western populations, and their application in different cultural contexts can generate inaccurate results or neglect factors relevant to certain ethnic groups. This raises ethical questions about the fairness of access to appropriate and fair assessment for all patient categories. Cultural adaptations of these scales are needed to ensure their validity and relevance to diverse populations. Another important aspect is the risk of labelling patients and creating stigma through the use of formal assessments. Although the purpose of risk assessment is to prevent suicide, the results of assessments can sometimes contribute to stigmatisation of the patient, which can hinder access to treatment or negatively affect the therapeutic relationship. Therefore, clinicians must be aware of these risks and approach the communication of results sensitively, ensuring that the patient feels supported and not judged.

The risk of suicide is shaped by several sociocultural, demographic, and psychological influences. Understanding these factors is key to using risk assessment tools effectively. For example, cultural perceptions of mental health, social pressures, and personal life experiences contribute to suicidal behavior. Tailoring interventions to each of these contextual variables is essential for the production of comprehensive and effective suicide prevention strategies.

The article emphasises the necessity of ongoing research and refinement of suicide risk assessment tools. As our understanding of suicidal behavior evolves, so too must the tools we use to assess and manage it. Continuous validation and adaptation of these scales ensure they remain relevant and effective in diverse clinical settings and populations. This ongoing research is vital for identifying new risk factors, improving existing tools, and developing innovative approaches to suicide prevention.

5. Conclusion

In conclusion, the article underscores the importance of integrating validated suicide risk assessment tools into clinical practice to enhance the early detection and management of suicidal behaviours. By providing a thorough analysis of key scales, the article contributes to the understanding of their application, strengths, and limitations. Ethical considerations and the need for culturally sensitive approaches are highlighted as critical components of effective suicide prevention. Ongoing research and refinement of these tools are essential to adapt to the evolving landscape of mental health care, ultimately improving patient outcomes and reducing the incidence of suicide.

By implementing these scales effectively, mental health professionals can provide more accurate and individualised care, fostering better mental health outcomes and potentially saving lives. The integration of these tools into routine practice, combined with ethical considerations and contextual understanding, forms a comprehensive approach to suicide risk assessment and intervention.

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