# Improving Confidence in Suicide Risk Assessment in Psychiatric Urgent Care

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Abstract

The utilization of suicide risk assessment tools is a critical component of a comprehensive approach to suicide risk assessment. However, some professionals hesitate to utilize screening tools routinely in practice. A project was undertaken to determine if the utilization of the Columbia-Suicide Severity Scale (C-SSRS) improved staff confidence in assessing suicide risk. Professionals within a psychiatric urgent care in Scottsdale, Arizona were provided with training on the C-SSRS. Participants then utilized the C-SSRS at triage with patients presenting with depression and/or suicidality over a two-month period. Self confidence in assessing suicide risk was evaluated utilizing The Efficacy in Assessing and Managing Suicide Risk Scale (SETSP-S). The acceptability and usability of the C-SSRS was evaluated utilizing The System Usability Scale (SUS). Findings of the Wilcoxon Signed Ranks test indicated changes in pre and posttest assessment scores as significant in seven of the eight assessment parameters. In addition, Cohen's effect size value suggested medium or large clinical significance in these same assessment parameters. Evidence suggests that efficient and effective assessment can improve staff confidence in assessing for suicidality and may improve morbidity and mortality rates for patients. The utilization of tools such as the C-SSRS could reduce health care costs associated with unnecessary hospital admissions as well as rehospitalizations. The routine utilization of assessment tools such as the C-SSRS many also be beneficial to healthcare specialties outside of behavioral health such as emergency departments and urgent care settings.

*Keywords*: suicide, suicide risk assessment, acute care, suicide screening tool, Columbia-Suicide Severity Scale

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Suicide has ranked among the top sentinel events reported to The Joint Commission for over 15 years (Posner et al., 2011). Studies of risk factors predicting suicide consistently suggest that suicidal ideation and a history of suicide attempts are among the most salient risk factors for suicide. Moreover, current studies suggest that a structured assessment of suicidal ideation and behavior significantly improves identification of high-risk patients (Posner et al., 2011). However, some behavioral health facilities do not utilize a single standard measure that examines suicidal ideation and behavior which may promote inconsistency and uncertainty in assessment amongst professionals. The purpose of this project was to examine the literature on suicide risk assessment tools and determine if the utilization of a standardized risk assessment tool improved confidence among professionals in assessing for risk of suicidality within an acute behavioral health setting.

## Problem Statement

Suicide is a global health problem that affects more than a million people worldwide (Nelson, Johnston, & Shrivastava, 2010). According to the most recent data available from the Centers for Disease Control and Prevention, suicide is the 10$^{th}$ leading cause of death for American adults with over 41,000 fatalities attributed to self-inflicted violence reported in 2014 (Centers for Disease Control and Prevention, 2016). Suicide is the second leading cause of death for Americas between the ages of 15 and 34, second only to unintentional injury (Roaten, Khan, Brown, & North, 2016). The number of suicides per 100,000 people increased from 14.1 in 2003 to 16.4 in 2013, despite greater national and local attention to the problem during this timeframe (Centers for Disease Control and Prevention, 2016). The number of nonfatal intentional self-

inflicted injuries are far greater, with an estimated 494,000 of such injuries occurring in the United States in 2013 (Roaten, Khan, Brown, & North, 2016).

The global numbers of suicides and intentional self-inflicted injuries have led to national and international efforts to identify and treat individuals at risk for suicide. In 2001, the Surgeon General organized the National Strategy for Suicide Prevention, under the auspices of the National Institute of Health (David-Ferdon et al., 2016). The National Strategy for Suicide Prevention has set specific goals and objectives to reduce suicide and creates a framework for suicide prevention for the nation (National Action Alliance for Suicide Prevention, 2017). Some of these goals and objectives include promoting awareness, developing support, developing and promoting effective clinical and professional practices, and improving access to mental health care (Sadock, Sadock, & Ruiz, 2015). In addition, one of these goals involves the implementation of training for recognition of at-risk behaviors and delivery of effective treatment; a key starting point in the suicide risk assessment process (Bisconer & Gross, 2007). Recognition of at risk behaviors guides risk level categorizations, supports clinical decision making, and informs emergency referral procedures. Despite these initiatives, neither national or international suicide rates have declined (Roaten, Khan, Brown, & North, 2016).

Although accurate suicide assessment is essential in all healthcare settings, it is imperative in high risk and vulnerable populations such as psychiatric emergency settings. Munich and Greene (2009) note that suicidality is one of the most common reasons for psychiatric hospitalization with “the underlying expectation that when people are admitted to hospitals their safety will be maintained” (p. 32). Unfortunately, 4%-7% of deaths by suicide continue to occur within the psychiatric hospital setting. Lack of proper assessment has been

identified as the leading cause of non-suicidal self-injury as well as death by suicide within the acute behavioral health setting (Roaten, Khan, Brown, & North, 2016).

Estimation of suicide risk in the acute psychiatric environment is a challenging task. In this fast-paced setting, patients may feel frustrated about wait times, overwhelmed by comorbid conditions, and feel uncomfortable with disclosing sensitive information to a provider that they do not know. Mental health providers have reported concerns with time constraints, high patient volumes, and very limited access to collateral information (Sands, 2007). Even experienced providers acknowledge that available information and time does not sufficiently inform efforts to determine potential for suicide risk in the urgent care setting. Despite these seemingly insurmountable difficulties, the psychiatric urgent care environment is a logical setting for developing and testing evidence-based systems of suicide risk stratification for more effective detection of patients at imminent risk for suicide (Roaten, Khan, Brown, & North, 2016).

## Purpose and Rationale

Depression and suicidality are common complaints that present to psychiatric urgent care settings (Brooker, Ricketts, Bennett, & Lemme, 2007). Due to the vulnerability of the mental health population and the acuity of symptoms within the urgent care setting, it is imperative that professionals are comfortable and competent in assessing for suicide risk (Clarke, Brown, & Giles-Smith, 2008). Currently, in the acute care mental health system in the state of Arizona, there is no standardized tool for assessing suicide. In addition, there are no clear guidelines on which professionals should perform suicide risk assessments. This reinforces the need for cross-disciplinary instruments that may be utilized by a variety of professions (Van Veen, Van Weeghel, Koekkoek, & Braam, 2015).

An urgent psychiatric care facility in Arizona was closely examined, and the current processes for assessing suicide risk was reviewed. It was discovered that multiple health care providers such as social workers, registered nurses, psychiatric nurse practitioners, and psychiatrists complete the suicide assessment with educational backgrounds ranging from bachelor to doctorate levels. There is no standardized screening tool utilized. Instead patients are asked “do you have any thoughts to hurt yourself?” Internal data was collected, and over 75% of staff within this facility felt that this assessment was too subjective and that patients were not adequately screened for suicidal ideation. A project was undertaken to examine if the implementation of an evidence-based suicide assessment tool, The Columbia-Suicide Severity Scale (C-SSRS), improved staff confidence in assessing suicide risk.

## Background and Significance

The prevalence and societal consequences of suicide highlight a need for continued efforts in suicide prevention. Effective and efficient screening methods are imperative to the treatment of suicidal patients. Kessler, Borges, and Walters (1999) note that 34% of individuals considered “lifetime suicidal ideators” will progress to making a suicide plan, and that 72% of individuals with a suicide plan will go on to make a suicide attempt. In addition, 26% of individuals who have suicidal ideation but do not have a plan will make an unplanned suicide attempt (Kessler, Borges, & Walters, 1999). These findings suggest that clear indicators do exist to aid in the detection of individuals that are high risk for suicidal behavior (Nelson, Johnston, & Shrivastava, 2010). Although there are a multitude of suicide assessment tools available to examine risk, some do not successfully differentiate between those individuals who are at serious risk for attempting suicide and those that are not (Madan et al., 2015).

The Columbia-Suicide Severity Scale (C-SSRS) is an example of a suicide risk assessment tool that does asses for high risk of suicidal behavior or attempts. The C-SSRS was designed to provide definitions of suicidal ideation and behavior and non-suicidal self-injurious behavior, qualify the full spectrum of suicidal ideation and suicidal behavior and gauge severity over specified periods, distinguish suicidal behavior and non-suicidal self-injurious behavior, and to create a user-friendly format that allows integration of information from multiple sources (Posner et al., 2011). These criteria are considered essential for judging the utility of scales assessing suicide-related behavior, and the C-SSRS is unique among rating instruments in meeting all of these criteria (Meyer et al., 2010). Posner et al. (2011) examined the psychometric properties of the C-SSRS and demonstrated convergent, divergent, and predictive validity; sensitivity to change; sensitivity and specificity of the instrument; and internal consistency of the intensity subscale of the instrument. The utilization of a standardized suicide screening tool with a specific focus on risk and behavior such as the C-SSRS could assist the clinician in efficient triage of these patients (Madan et al., 2015).

A continued obstacle with suicide risk assessment is the reluctance for clinicians to utilize tools such as the C-SSRS. An investigation into the current suicide risk assessment procedures among practicing clinicians found that assessment instruments were utilized infrequently, and clinicians rated these instruments as having limited usefulness (Nelson, Johnston, & Shrivastava, 2010). This is an area of opportunity, as several studies have supported objective rating scales as being more accurate predictors of risk than traditional clinical assessments (Hom, Joiner, & Bernert, 2016; Smith, Silva, Covington, & Joiner, 2013). One reason for this reluctance is the perceived failure of these tools to provide treatment meaning. 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 required to prevent a future suicide attempt (Nelson, Johnston, & Shrivastava, 2010). Clinicians may also be disinclined to utilize existing tools due to concern of inaccuracy of these tools in predicting suicide risk.

When standardized suicide risk assessment tools are not consistently utilized, providers must rely on clinical judgement to determine the patient's imminent risk. The question then becomes: how reliable are clinicians' judgments of levels of risk? Cahill and Rokow (2012) investigated differences in clinical judgement utilizing 35 hypothetical case examples provided to seven practitioners and found that all but two potential risk factors were related to risk and priority judgments. In addition, these authors found that the risk level of "low risk" might be particularly subject to variability in its interpretation. Even the term "risk" was found to be ambiguous within the study, as some found the term to mean probability of occurrence and others severity of occurrence (Cahill & Rokow, 2012).

It is widely accepted that clinical judgement improves with increased education, training, or experience. Indeed, Tanner's Clinical Judgement Model is a conceptual framework that identifies the process of improved clinical judgement via increased training and experience by working through the four dimensions of clinical judgement: noticing, interpreting, responding, and reflecting (Tanner, 2006). Despite this framework, the concept of clinical judgement improving with experience is not yet validated by research. In fact, a meta-analysis of 75 clinical judgement studies involving more than 4,600 clinicians concluded that education and clinical experience have a very small effect (approximately 13%) on the accuracy of clinical judgement (Spengler et al., 2009). Clinical errors are both universal and inevitable; clinical judgements, however, especially those that are made in the acute care environment under the additional stress of potentially providing life-saving interventions, may be especially prone to error (Silverman &

Berman, 2014). Providers need a clinical tool to assist in assigning a level of suicide risk. Without such a guide, the provider is left to his or her education, training, intuition, judgment, and previous experience to determine how to best intervene and manage the patient. Clinical judgements and intuitions are influenced by knowledge and experience, but greater experience does not necessarily equate to better judgment (Silverman & Berman, 2014). It is dangerous and unpredictable to rely on "clinical intuition" in arriving at a judged risk level, especially when a decision could mean the difference between life and death (Silverman & Berman, 2014).

The detection of suicide risk and the treatment decisions that are dependent on an accurate suicide assessment are perhaps the most significant actions that a behavioral health provider must make. The failure to reasonably complete an accurate assessment has the potential for significant outcomes for both the patient (a possible preventable death by suicide) and the clinician (death of the patient, legal action, etc.) (Silverman & Berman, 2014). Studies suggest that assessment tools such as the C-SSRS can be utilized to accurately assess suicide risk and behavior. Several opportunities have been identified in regard to why risk assessment tools are not routinely completed within psychiatric urgent care facilities. These barriers include the availability of an evidence-based risk assessment tool, lack of provider confidence regarding risk assessment tool reliability, and clinician over-reliance on clinical judgment to assess suicide risk. This has led to the clinically relevant PICOT question: In a convenience sample of adolescent and adult patients presenting to psychiatric urgent care with reports of suicidality and/or depression, does the implementation of an evidence-based suicide assessment tool compared to no assessment tool affect staff confidence in screening for suicidal risk over a two-month period?

## Search Strategy

The databases searched for this literature review included CINAHL, PsycINFO, PubMed, and The Cochrane Library. The search strategy included the keywords: *suicide, risk, assessment,* and *tool.* The Boolean connector "AND" was utilized between these keywords. The initial search of *suicide* and *assessment* yielded 2,959 results in CINAHL (Appendix A), 7,905 in PsycINFO (Appendix B), 6,490 in PubMed (Appendix C), and 9,779 in The Cochrane Library (Appendix D). By setting limits to English language, humans, publication dates from 2005-2017 and adding the keywords of *risk* and *tool*, a final yield of 275 studies in CINAHL (Appendix A), 288 in PsycINFO (Appendix B), 93 in PubMed (Appendix C) and three in The Cochrane Library (Appendix D) was achieved.

A hand ancestry was executed on current references to complete the exhaustive search, but results led to studies published beyond the 12-year inclusion criteria. Therefore, these studies are not included in this review. A grey literature search was completed for background and significance which included reports, practice guidelines, and conference proceedings. These were excluded based on a low level of evidence. Additional unpublished works were reviewed and also deemed inappropriate for this review.

After an extensive search for literature related to suicide risk assessment tools, ten studies were chosen for inclusion which met criteria and were relevant to the stated PICOT question. Each study was independently reviewed and the data was extracted and organized via evidence and synthesis tables for examination and comparison (Appendix E).

## Critical Appraisal & Synthesis

Ten studies were retained for this literature review which were all evaluated utilizing Melnyk and Fineout-Overholt's (2011) rapid critical appraisal. Most of the studies that best answered the outlined PICOT question were retrospective studies, which created lower levels of

evidence. However, the quality and validity of the retained studies were substantive, demonstrating statistically significant results (Appendix E). Of the final ten studies, there were five retrospective cohort studies, four systematic reviews, and one descriptive study (Appendix E). Minimal biases existed throughout all studies. In general, the studies displayed adequate sample sizes with moderate heterogeneity. The studies provided results that were representative of patients presenting to acute care facilities with complaints of suicidality worldwide. Strong statistical and clinical homogeneity demonstrated that identifying and implementing assessment tools in the clinical area predict suicide risk. There was moderate methodological heterogeneity throughout the studies concerning what tools are most effective in risk assessment.

The ten studies provided reviewed nineteen suicide risk assessment tools (Appendix E). Similar domains were examined within these assessment tools including suicidal ideation, history of suicide attempts, plan to commit suicide, presence of hopelessness, and co-morbid mental health conditions (Appendix F). Predictive validity, sensitivity to change, and positive and negative predictive values were compared to determine quality of measurement tools (Appendix F). Sensitivity was examined amongst the tools to determine the probability of the individual tools to detect true positive results. Five of the twelve tools displayed sensitivity ≥ 80%. Specificity was utilized to examine the probability of the risk tools to detect true negative results. Four of the twelve tools demonstrated specificity ≥ 80%. The only tool that demonstrated both sensitivity and specificity ≥ 80% was the C-SSRS. Cronbach's alpha values were examined to determine internal consistency of the instruments. Eight of the twelve tools examined demonstrated strong internal reliability coefficients ≥ 0.80 (Appendix F).

## Evidence Synthesis Conclusions

Evidence suggests that the utilization of assessment tools can help to identify individuals who are the highest risk for completing suicide (Bisconer & Gross, 2007; Perry et al., 2010; Posner et al., 2011). The review outlines numerous standardized suicide risk assessment instruments with varying degrees of reliability, validity, internal consistency, sensitivity and specificity. This literature review suggests that the Columbia-Suicide Severity Rating Scale (C-SSRS) demonstrated good divergent, convergent, predictive, and incremental validity. The C-SSRS also yielded strong sensitivity to change, internal consistency and inter-rater reliability. The C-SSRS demonstrated the highest sensitivity and specificity for suicidal risk and behavior classifications amongst the tools examined (Appendix F). The research suggests that the C-SSRS is suitable for assessment of suicidal ideation and behavior in acute care clinical settings.

## Theoretical Framework

Albert Bandura's Social Cognitive Theory was utilized as a framework to guide the suicide risk assessment project. The social cognitive theory as proposed by Bandura (1986) involves the reciprocal relationships among cognitions, behaviors, and the environment. These are interdependent casual factors, but each has the capacity to affect the others in reciprocal relationships. The cognitive component of the theory includes influential factors such as beliefs about one's competence, causes of success and failure, and a sense of control, values, and goals. The environmental component of the theory involves such factors as the cultural context, exposure to an illness, and social support. The behavioral aspect of the theoretical framework involves medication adherence and coping responses (Bandura, 1986). Bandura (1986) asserts that the social cognitive model explains the means, resources, and support needed to change risky behavior. The social cognitive theoretical framework is relevant to suicide risk assessment in that it assists with the identification of factors (cognitive, environmental, and behavioral) that

place an individual at higher risk for suicide. An understanding of these factors can provide professionals with important information regarding the sources of suicidal behavior, including suicide prevention, coping and risk behaviors, adherence to treatment, and self-help.

## Evidence-Based Practice Model

The Iowa Model of Evidence Based Practice to Promote Quality Care will be utilized to facilitate this proposed change to current practice (Appendix G). This model provides guidance to healthcare providers in making decisions regarding clinical and administrative practices that directly affect patient outcomes. It was designed to support evidence-based healthcare by following a basic problem-solving approach by utilizing the scientific process, simplifying the process, and being highly application oriented (Melnyk & Fineout-Overholt, 2015). Applying this model directly to the project, the model provides a problem-solving approach that identifies a need for improvement in suicide risk assessment within the psychiatric urgent care setting, encourages a thorough review of literature, identifies key stakeholders (patients, professionals, and administrators), and identifies the necessity to include multiple disciplines in the training and implementation of the project (social workers, nurses, nurse practitioners, and physicians). By utilizing feedback loops, reflecting analysis, evaluation, and modification based on evaluative data of both process and outcome indicators, the Iowa model helped to guide the project through planning, implementation, and evaluation, ultimately encouraging potential practice change (Melnyk & Fineout-Overholt, 2015).

## Project Methods

Research suggests that the utilization of an evidence-based standardized screening tool can improve professional confidence in accurate suicide assessment (Silverman & Berman, 2014). The evidence also suggests that The Columbia-Suicide Severity Scale (C-SSRS) is

suitable for assessment of suicidal ideation and behavior in acute care clinical settings (Posner et al., 2011; Meyer et al., 2010). A project utilizing the C-SSRS was implemented over a two-month time frame in an acute psychiatric urgent care clinic in Scottsdale, Arizona. The key stakeholders of this project included patients and their families, administrative personnel, and facility staff including behavioral health technicians, crisis interventionists, case managers, social workers, registered nurses, nurse practitioners, and psychiatrists.

Inclusion criteria for this project included social workers, registered nurses, psychiatric nurse practitioners, and psychiatrists currently employed at the project site. Participants were required to be 21 years of age or older and able to speak, write, and understand the English language. Completion of a pre-education questionnaire and attending an educational session was considered consent for participation in the project. There were no physical risks associated with participation in the project. Participants were informed that they may experience some discomfort when answering questions, but any discomfort was expected to be minor and transient. Participants were also told that they could skip any project questions that they did not wish to answer, and their responses would be confidential. Potential benefits to participants included increased confidence in conducting suicide risk assessment and improved management of suicidal patients.

Project site approval was received prior to project implementation. Individuals who agreed to participate in the project attended a 15-minute educational session during facility staff meetings in the fall of 2017 on the C-SSRS. Participants then utilized the C-SSRS during triage assessments involving individuals presenting with depression and/or suicidality. Project participants then completed anonymous questionnaires pre-education, immediately post-education, and two-month post-education. Each participant created a nickname that was included

in each questionnaire, so data was able to be compared across time. Completed project data was kept secured in password protected files that were only accessible by the author and author's mentor.

Sociodemographic data was collected in this project including the age of the participant, gender, race/ethnicity, highest level of education, and years of experience in the behavioral health field. Project evaluation data was collected via five questions regarding the quality of the educational presentation.

Three instruments were utilized within this project. The Columbia-Suicide Severity Scale (C-SRS) was utilized to assess for high risk suicidal behavior or attempts. Posner et al. (2011) examined the psychometric properties of the C-SSRS and demonstrated convergent, divergent, and predictive validity; sensitivity to change; sensitivity and specificity of the instrument; and internal consistency of the intensity subscale of the instrument. The Efficacy in Assessing and Managing Suicide Risk Scale was utilized to assess confidence in suicide risk assessment. The eight-item self-reported Efficacy in Assessing and Managing Suicide Risk Scale was developed by Harned et al. (2017) and has demonstrated excellent reliability (Cronbach's alpha = 0.90) in addition to construct and convergent validity. Items within this tool begin with the statement "I am confident that I can" and conclude with statements such as "accurately assess risk factors for suicide" and "implement evidence-based strategies for managing suicide risk". Items are rated on a seven-point scale ranging from 1 (strongly disagree) to 7 (strongly agree) and are averaged to create a total score (Harned et al., 2017). The System Usability Scale was utilized to assess the acceptability and usability of the C-SSRS. The System Usability Scale is a widely used measure of usability of technology products and has excellent psychometric properties. Bangor, Kortum, and Miller (2008) found excellent reliability with this tool (Cronbach's alpha = 0.911) in

addition to construct, convergent, and divergent validity. All items on the System Usability Scale were modified by changing the generic term “the system” to refer specifically to the C-SSRS. Example questions included “I found the C-SSRS easy to use” and “I found the C-SSRS unnecessarily complex”. Items were rated on a five-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). The System Usability Scale utilizes a scoring algorithm that generates a total score ranging from zero (negative) to 100 (positive). Scores of 68 or higher are considered to indicate above average usability (Bangor et al., 2008).

Descriptive analyses and the Wilcoxon Signed Ranks Test were utilized to describe key variables and to compare scores over time. Cohen’s effect size was utilized to determine the clinical significance of the project findings.

## Project Results

Twenty-one adult participants (66.7% female, 71.4% 20-39 years old, 71.4% 10 years or less in the behavioral health field, 66.7% completed a Bachelor’s degree) completed anonymous questionnaires pre-education and two-month post-education. 85.7% of participants agreed or strongly agreed that the information in the educational session was informative and relevant to their clinical practice. 47.6% of participants agreed that the educational presentation motivated them to use the Columbia-Suicide Severity Scale to assess suicidal behavior. 42.9% of participants agreed that they planned to utilize the Columbia-Suicide Severity Scale after participating in the education on the instrument.

Pre and post mean scores on The Efficacy in Assessing and Managing Suicide Risk Scale were compared to assess participant confidence in suicide risk assessment. The mean pre-education long term-risk assessment score was 5.52 (SD = 1.50) and the mean post-education score was 6.38 (SD = 0.74). The mean pre-education imminent risk factor assessment score was

6.10 (SD = 1.09) and the mean post-education score was 6.62 (SD = 0.59). The mean pre-education protective factors risk assessment score was 5.86 (SD = 0.73) and the mean post-education score was 6.19 (SD = 0.75). The mean pre-education tailor suicide risk assessment score was 5.10 (SD = 1.51) and the mean post-education score was 5.71 (SD = 1.10). The mean pre-education evidence-based strategies risk assessment score was 5.14 (SD = 1.46) and the mean post-education score was 5.81 (SD = 1.03). The mean pre-education consult with a colleague score was 5.95 (SD = 0.97) and the mean post-education score was 6.19 (SD = .87). The mean pre-education decision making process assessment score was 5.90 (SD = 0.83) and the mean post-education score was 6.19 (SD = 0.68). The mean pre-education accurately document risk assessment score was 5.76 (SD = 1.34) and the mean post-education score was 6.29 (SD = 0.78).

The Wilcoxon Signed Ranks test indicated changes in pre and posttest assessment scores as significant in the long-term risk ($Z = 3.35$, $p < .05$), imminent risk factor ($Z = 2.46$, $p < .05$), protective factors ($Z = 2.65$, $p < .05$), tailor suicide risk ($Z = 2.57$, $p < .05$), evidence-based strategies ($Z = 2.44$, $p < .05$) , decision-making process ($Z = 2.12$, $p < .05$), and accurately document risk ($Z = 2.32$, $p < .05$) assessment parameters.

Cohen's effect size value suggested medium clinical significance in imminent risk factors ($d = 0.53$), protective factors ($d = 0.69$), tailor suicide risk ($d = 0.67$), evidence-based strategies ($d = 0.60$), decision-making process ($d = 0.51$), and accurately document ($d = 0.53$) risk assessment parameters and large clinical significance in the long-term risk ($d = 0.88$) assessment parameter.

Descriptive statistics were utilized to examine the usability and acceptability of the C-SSRS as measured by The System Usability Scale. 71.4% of participant agreed or strongly

agreed with the statement “I think that I would like to use the Columbia-Suicide Severity Scale frequently”. 90.4% of participants disagreed or strongly disagreed with the statement “I found the Columbia-Suicide Severity Scale unnecessarily complex”. 85.7% of participants agreed or strongly agreed with the statement “I thought the Columbia-Suicide Severity Scale was easy to use. 100% of participants disagreed or strongly disagreed with the statement “I think that I would need the support of a technical person to be able to use the Columbia-Suicide Severity Scale”. 57.1% of participants agreed with the statement “I found that the various domains in the Columbia-Suicide Severity Scale were well integrated”. 71.4% of participants disagreed or strongly disagreed with the statement “I thought there was too much inconsistency in the Columbia-Suicide Severity Scale”. 95.3% of participants agreed or strongly agreed with the statement “I would imagine that most people would learn to use the Columbia-Suicide Severity Scale very quickly”. 71.4% of participants disagreed or strongly disagreed with the statement “I found the Columbia-Suicide Severity Scale very awkward to use”. 66.7% of participants agreed or strongly agreed with the statement “I felt very confident using the Columbia-Suicide Severity Scale”. 100% of participants disagreed or strongly disagreed with the statement “I needed to learn a lot of things before I could utilize the Columbia-Suicide Severity Scale”.

## Discussion

The Columbia-Suicide Severity Scale was designed as a comprehensive clinical tool for assessment of suicidality to better predict level of risk as well as to guide the development of a care and management plan (Posner et al., 2011). Evidence suggests that some professionals are hesitant to routinely utilize a standardized risk assessment tools such as the C-SSRS in clinical practice. The intent of this project was to determine if the utilization of the C-SSRS improved

staff confidence in suicide risk assessment. The project also aimed to determine the usability and accessibility of the C-SSRS amongst project participants.

Evidence suggests that the utilization of the C-SSRS during triage assessments with adult and adolescent patients presenting with depression and/or suicidality can increase staff confidence in suicide risk assessment. Cohen's effect size value suggests medium or large clinical significance in seven of the eight assessment parameters measured by The Efficacy in Assessing and Managing Suicide Risk Scale. In addition, over 70% of project participants reported that they would like to utilize the C-SSRS frequently, 85% of participants reported that the C-SSRS was easy to use, and 95% of participants reported that they were able to learn how to utilize the C-SSRS quickly. This suggests that the majority of project participants felt that the C-SSRS was highly usable and acceptable.

The findings of this project are timely and relevant as suicide prevention remains a current national and international health initiative. Efficient and effective suicide risk assessment can improve morbidity and mortality rates for patients and improve staff confidence in adequately assessing for suicidality within a high-risk population. Routine implementation of the C-SSRS can improve patient outcomes and strengthen assessment skills amongst professionals. This in turn can positivity impact the quality of care provided to psychiatric patients presenting in crisis. The utilization of an evidence-based suicide screening tool can also significantly reduce health care costs associated with unnecessary hospital admissions as well as re-hospitalizations. In consideration of the findings of this project, it is reasonable to suggest that the implementation of a standardized suicide risk assessment tool such as the C-SSRS could be expanded to additional inpatient and outpatient behavioral health facilities. The utilization of the C-SSRS may also be

beneficial in acute medical care facilities such as emergency departments in screening for suicidality.

Several strengths can be extracted from this project. The project demonstrated statistically significant findings within psychiatric urgent care; a high risk, high acuity patient population. This highly vulnerable population is at highest risk for completing suicide (Roaten et al., 2016). Interventions to reduce risk to these patients is a continued national and international focus in the behavioral health community. It is also reasonable to assume that successful intervention with this patient population will also be successful with patients that are not at as high of a risk for suicide such as in the general mental health population. Participants involved in this project noted that the C-SSRS was highly usable and accessible, promoting greater probability of routine utilization of the tool.

Although the results of this project are promising, they represent a preliminary evaluation of the implementation of the C-SSRS into routine practice. This project demonstrated a relatively small sample size of 21 participants. Further studies are warranted to determine the generalizability of the current findings. In addition, this project involved the utilization of a paper version of the C-SSRS screening form, which was in addition to the electronic medical record documentation practices of the facility. Several participants noted the inconvenience of utilizing two documentation styles and expressed concern regarding time restrictions in completing required documentation during the triage process which is designed to be brief and succinct. Ideally, collaboration with facility information technology departments to facilitate an electronic version of suicide risk screening tools may promote buy in and compliance amongst staff involving such a change to current practice. To promote consistency and sustainability, the utilization of the C-SSRS or other standardized screening tool should be implemented into

facility policy and procedure and quality assurance protocols such as chart reviews should be utilized to assess compliance (Nelson et al., 2010).

## Conclusion

The assessment and management of suicidal patients is challenging and further complicated by a lack of staff confidence in risk assessment and utilization of an evidence-based suicide risk assessment tool. Current evidence suggests that improving confidence amongst staff in suicide risk assessment can be achieved through the utilization of a valid and reliable tool; the C-SSRS. Although the identification of an efficient and effective risk assessment tool is an important first step in improving confidence and skill in risk assessment amongst healthcare professionals, it is important to evaluate such a change to current practice from an interdisciplinary perspective. Specifically, information technology would be a valuable resource to consult when implementing screening tools into current electronic medical record documentation policies. Higher compliance rates with utilizing screening tools have the potential to improve patient outcomes such as reducing morbidity and mortality rates and reducing inpatient hospitalizations ultimately contributing to current international and national efforts to reduce rates of suicide.

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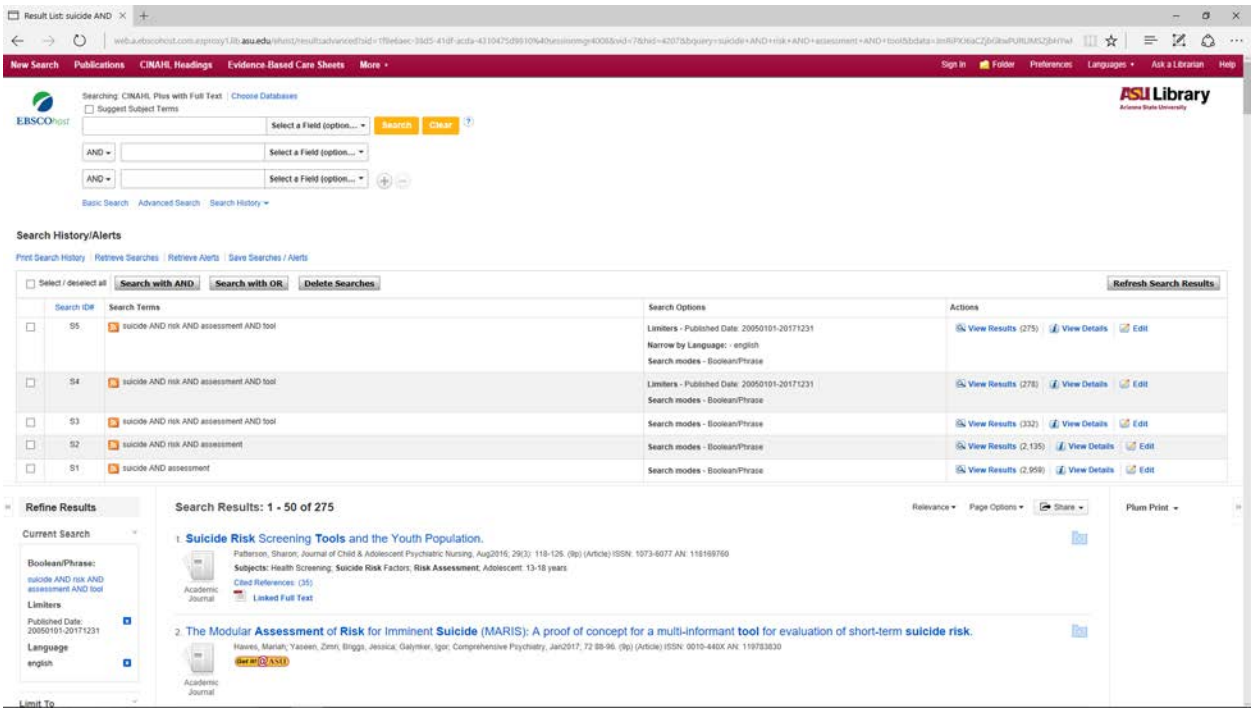
*Appendix A*

Database Search Strategy

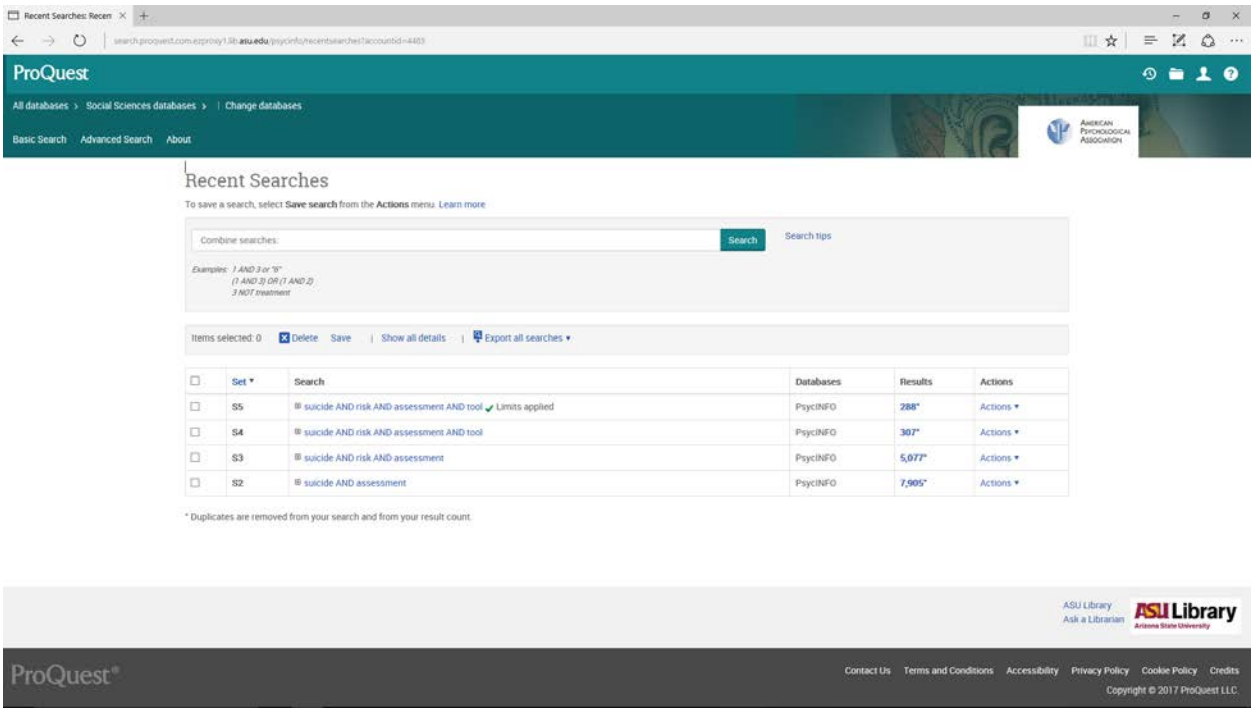
CINAHL



*Appendix B*

Database Search Strategy

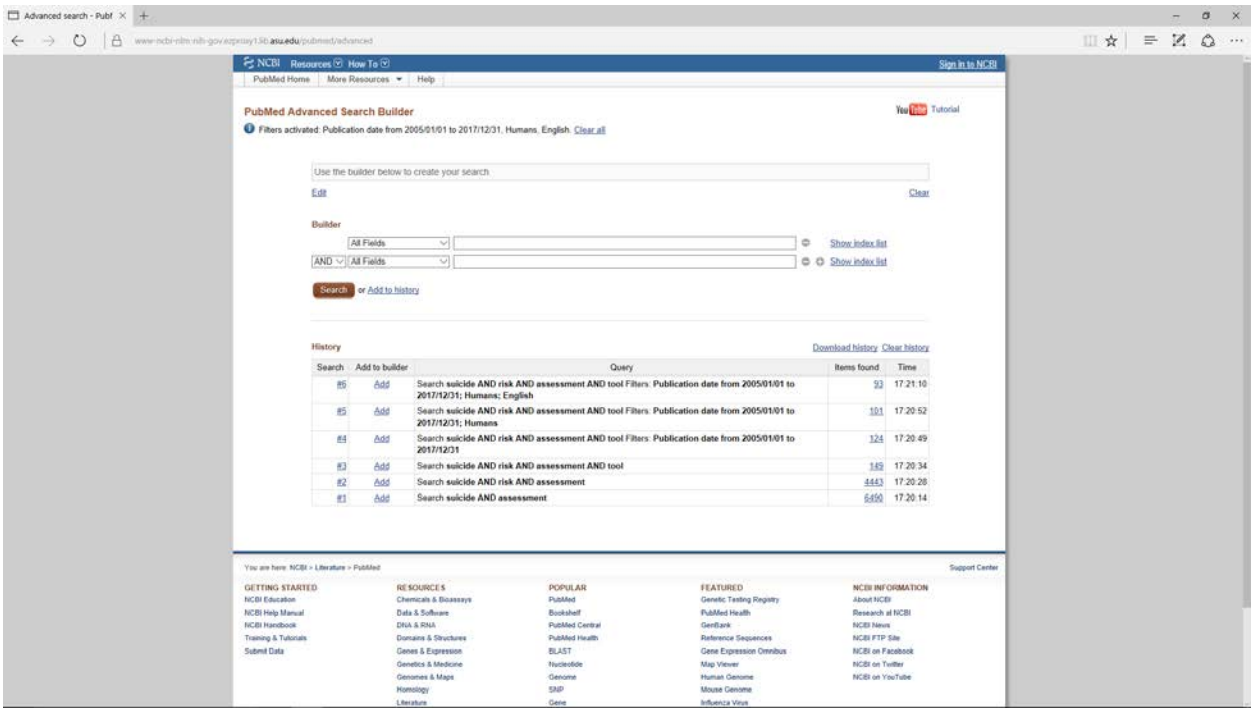
PsycINFO



*Appendix C*

Database Search Strategy

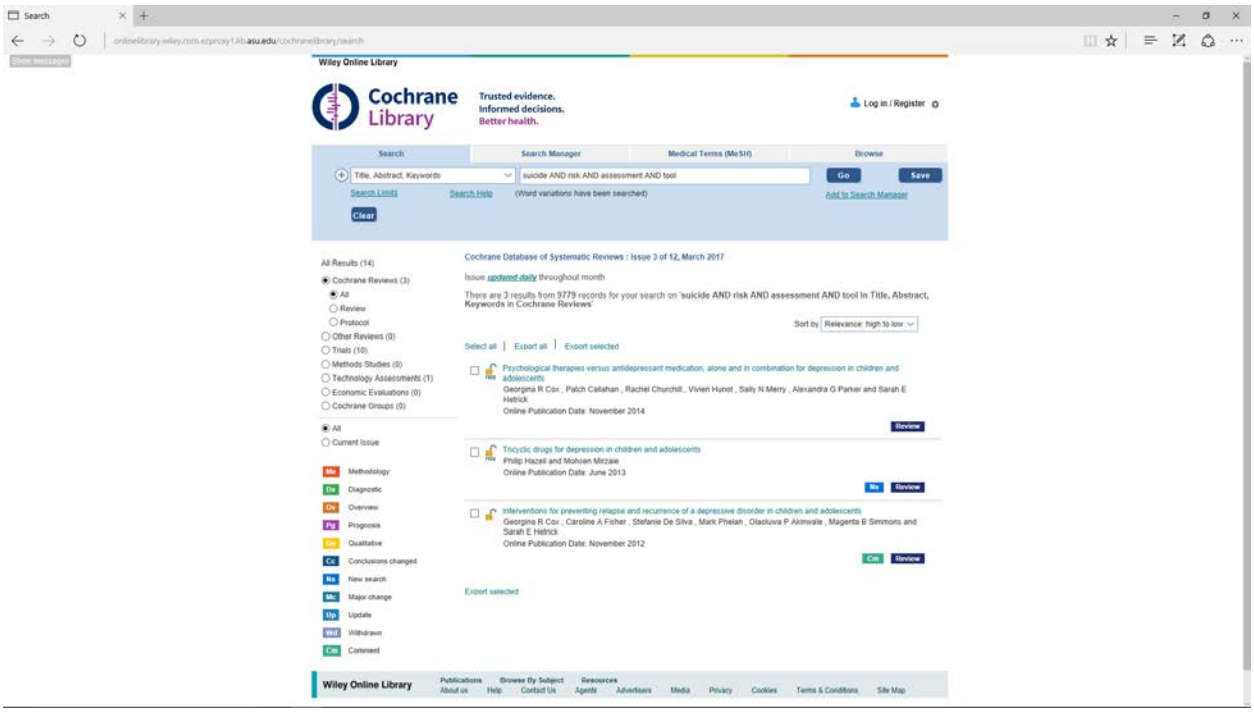
PubMed



*Appendix D*

Database Search Strategy

The Cochrane Library



*Appendix E*

Table 1
*Evaluation Table*

| Citation | Conceptual Framework | Design/Method | Sample/Setting | Major Domains & Definitions | Measurement | Data Analysis | Findings | Decision for Use in Practice/Application to Practice |
|---|---|---|---|---|---|---|---|---|
| Ballard et al., (2017). Identification of at-risk youth by suicide screening in a pediatric emergency department.<br><br>Funding: Garrett Lee Smith grant from the SAMHSA.<br><br>No conflicts or biases recognized.<br><br>United States | Inferred to be Trans-theoretical model | **Design:** Psychometric evaluation. Retrospective cohort study of a consecutive case series.<br><br>**Purpose:** Examine compliance with tool administration, examine relationship between screening results and primary complaint, demographics, and disposition, identify validity of ASQ, evaluate relationship of ASQ results and repeat ED visits | N = 970<br><br>Ages: 8-18<br><br>Mean age: 13.4<br><br>N GF = 53%<br><br>PedsED<br><br>DC = 3/2013-4/2014<br><br>**Inclusion Criteria:** Pts aged 8-18 presenting with a psychiatric presenting complaint to Johns Hopkins PedsED.<br><br>**Exclusion Criteria:** PTs under age 8 and over 18. PTs with a recorded diagnosis of MR, DD, autism/Asperger's. | D1: wished dead<br><br>D2: family<br><br>D3: SI<br><br>D4: SA<br><br>OA: SR<br><br>ASQ developed from SIQ | ASQ<br><br>Relationship between ASQ on index and repeat ED visits<br><br>Suicide-related reasons in 6 months post index visit. | SPSS version 21.0<br><br>*t* test<br><br>SS considered at $p < .05$<br><br>95% CI<br><br>Sensitivity and specificity | D1: $t = 0.28$ $p<.001$<br><br>D2: $t = 0.58$ $p = .008$<br><br>D3: $t = 0.38$ $p<.001$<br><br>D4: $t = 1.03$ $p = .88$<br><br>Sensitivity of 93% and specificity of 43% predict return to ED w/in 6 months | LOE: IV, Grade D<br><br>Strengths: Short, easy to use for multiple disciplines, easy to implement in EMR<br><br>Limitations: single site, utilized psych and non-psych population. Focused more on likelihood of repeat visits to ED, not what ASQ measured<br><br>Application: useful for predicting readmissions to ED, may help identify more at-risk individuals |
| Bisconer et al., (2007). Assessment of suicide risk in a psychiatric hospital. | Inferred to be Trans-theoretical model | **Design:** Psychometric evaluation<br><br>**Purpose:** Evaluate utility of SPS, ASIQ, BSSI, | N1: 25 (DTS)<br><br>Ages: 22-53<br><br>N GF: 12<br><br>N2: 42 (DTO) | SPS<br>D1: hopelessness<br><br>D2: SI<br><br>D3: negative self-evaluation | SPS<br><br>ASIQ<br><br>BSSI<br><br>BHS | Cronbach's alphas of .80 and greater demonstrate adequate internal consistency reliability. | Cronbach's alpha:<br><br>SPS: .92<br><br>ASIQ: .98 | LOE: IV, Grade D<br><br>Strengths: Study instruments showed excellent internal consistency reliability, |

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| Citation | Conceptual Framework | Design/Method | Sample/Setting | Major Domains & Definitions | Measurement | Data Analysis | Findings | Decision for Use in Practice/Application to Practice |
|---|---|---|---|---|---|---|---|---|
| Funding: Not disclosed.<br><br>No conflicts or biases recognized.<br><br>United States. | | BHS, BDI-II, and BAI to assess SB, depression, and anxiety. | Ages: 19-57<br><br>N GF: 30<br><br>**Inclusion Criteria:** Inpatient in a public acute psychiatric hospital. Must be considered competent to provide consent.<br><br>**Exclusion Criteria:** Severe cognitive impairment, not able to read or understand the consent form. | D4: hostility<br><br>ASIQ<br>D1: SI<br><br>BSSI<br>D1: thoughts, plan, intent to commit suicide<br><br>BHS<br>D1: degree of negativity about immediate and long-range future<br><br>BDI-II<br>D1: severity of depression<br><br>BAI<br>D1: severity of anxiety | BDI-II<br><br>BAI | Pearson product-moment correlations between instruments examined extent of instruments purporting to measure SB are related | BSSI: .90<br><br>BHS: .97<br><br>BDI-II: .94<br><br>BAI: .94<br><br>Correlations between study instruments ranged from .29-.82. All coefficients were statistically significant. Only the SPS, ASIQ, and BDI-II shared coefficients .80 or greater. | examined multiple instruments<br><br>Limitations: small sample size, only examined DTS, DTO, unable to care for self<br><br>Application: Only SPS, ASIQ, BDI-II shared correlations of .80 or greater in simple eval of convergent validity.<br><br>SPS, ASIQ, BDI-II had significant errors in classifying participants into suicide risk and comparison groups<br><br>ASIQ no reported inpatient normative sample<br><br>BDI-II better predictor of SR than SPS and ASIQ, but lengthy tool which may not be feasible in ER setting. |
| Bolton et al., (2015). Suicide risk assessment and intervention in people with mental illness. | Inferred to be Trans-theoretical model | **Design:** Systematic review<br><br>**Purpose:** Review of BHS, BDI, SIS, SAD, C-SSRS, STS, and SPS including | Ns = not identified<br>ELD = 2<br><br>DC 1/1990-2/2015<br><br>**Inclusion Criteria:** | BHS: 6<br><br>BDI: 2<br><br>SIS: 3<br><br>SAD: 3 | BHS<br><br>BDI<br><br>SIS<br><br>SAD | Sensitivity/specificity<br><br>PPV | BHS:<br><br>PPV: 1%<br><br>Sensitivity: 78-80% | LOE: I, Grade A<br><br>Strengths: multiple tools compared, comprehensive literature review and involved ED/INPTPSY setting. Included studies through 2015. |

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| Citation | Conceptual Framework | Design/Method | Sample/Setting | Major Domains & Definitions | Measurement | Data Analysis | Findings | Decision for Use in Practice/Application to Practice |
|---|---|---|---|---|---|---|---|---|
| Funding: Canadian Institutes of Health Research Foundation NARSAD young investigator grant | | sensitivity and specificity. | English language, systematic reviews, meta-analysis, RCT<br><br>**Exclusion Criteria:** Unpublished literature (none assessed validity of tool). | C-SSRS: 1<br><br>STS: 1<br><br>SPS: 1 | C-SSRS<br><br>STS<br><br>SPS | | Specificity: 42%<br><br>BDI:<br><br>PPV: 2%<br><br>SIS:<br><br>PPV: 4%-23%<br><br>Specificity: 52%<br><br>SAD:<br><br>PPV: 5%<br><br>Sensitivity: 23%<br><br>C-SSRS:<br><br>PPV: 14%<br><br>NPV: 98%<br><br>Sensitivity: 67%<br><br>Specificity: 76%<br><br>STS: Not provided | Limitations: Not all had sensitivity and specificity information, unable to compare measures with each study. Review does not specify ages of subjects in studies.<br><br>Application: C-SSRS with overall highest sensitivity/specificity/PPV. Brief instrument tested in urgent care/emergency settings. |

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| Citation | Conceptual Framework | Design/Method | Sample/Setting | Major Domains & Definitions | Measurement | Data Analysis | Findings | Decision for Use in Practice/Application to Practice |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | SPS: Not provided | |
| Chang et al., (2015). Suicide screening tools and their association with near-term adverse events in the ED.<br><br>Funding: Unfunded<br><br>No conflicts or biases reported.<br><br>United States | Inferred to be Trans-theoretical model | **Design:** Psychometric evaluation. Prospective operational study.<br><br>**Purpose:** Evaluate relationship between BSSI, C-SSRS, PHQ-9, and SAD regarding INPT and near-term ED events. | N = 50<br><br>Mean age: 36.4<br><br>n GF = 28<br><br>n PC = 47<br><br>ED<br><br>DC = not identified<br><br>**Inclusion Criteria:** Over age 18, presenting to ED with CC of "suicidal ideation", "thinking of hurting myself", "I want to die", or "SI".<br><br>**Exclusion Criteria:** PTs with concomitant ETOH or substance intoxication, acute medical illness, or being evaluated for SA. | D1: within ED adverse events<br><br>D2: INPT<br><br>D3: prolonged hospitalization<br><br>Also examined clinician intuition and subsequent PT course | BSSI<br><br>C-SSRS<br><br>PHQ-9<br><br>SAD<br><br>Need for psych hospital admission<br><br>Prolonged stay at psychiatric facility<br><br>Adverse events during ED (sedation, restraints, security intervention) | Logistic regressions<br><br>Wald test for individual parameters<br><br>Receiver operating characteristic (ROC) curves<br><br>P value for test of null hypothesis that true AUC = to 0.5. | BSSI, PHQ-9, C-SSRS: AUC < 0.5 for within-ED events, admission to psych facilities, prolonged psych admissions<br><br>SAD: AUC = 0.72 psych admission and 0.76 for prolonged psych hospitalization. Not predictive of ED adverse events. | LOE: IV, Grade D<br><br>Strengths: examined multiple tools, focused on risk in ED, examined adverse events in ED<br><br>Limitations: Limited data analysis results provided, ROC curve results do not provide *C* statistic.<br><br>Application: BSSI, PHQ-9, C-SSRS did not significantly predict within ED adverse events of admissions to psych facility. SAD near significant, but further research needed in ED setting. |
| Galynker et al., (2016). Prediction of suicidal behavior in high risk | Inferred to be Trans-theoretical model | **Design:** Psychometric evaluation. Retrospective review of EHR data. Logistic | N = 201<br><br>n = 139 (completed discharge battery) | D1: entrapment<br><br>D2: panic / dissociation | SCI<br><br>Measured SI and SA severity. | Cronbach's alpha coefficient<br><br>Chi-square | Cronbach's α = 0.970<br><br>Short-term SB: Sensitivity: 64% | LOE: IV, Grade D<br><br>Strengths: examined PT's in acute state, recent data, internal structure, reliability, convergent and |

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| Citation | Conceptual Framework | Design/Method | Sample/Setting | Major Domains & Definitions | Measurement | Data Analysis | Findings | Decision for Use in Practice/Application to Practice |
|---|---|---|---|---|---|---|---|---|
| psychiatric patients using an assessment of acute suicidal state: The suicide crisis inventory.<br><br>Funding: American Foundation for Suicide prevention; Contract grant.<br><br>No conflicts or biases recognized.<br><br>United States | | regression models assessed the SCI's predictive validity for SB in the 4-8 weeks following HD.<br><br>**Purpose:** Development of SCI to evaluate Suicidal Crisis Syndrome. The psychometric properties of SCI including predictive validity for SB were assessed. | n = 127 (final follow-up sample)<br><br>Mean age: 35.3<br><br>n GF = 108<br><br>n PS = 33<br><br>n SUB = 121<br><br>INPTPSY<br>DC = 4/2013-7/2015<br><br>**Inclusion Criteria:** PTs hospitalized for SI and SA, referred by inpatient clinicians.<br><br>**Exclusion Criteria:** PTs that were homeless, lacked collateral means of contact, were unable to understand the consent, or suffered from a medical/neurological condition that might interfere with participation. | D3: ruminative flooding<br><br>D4: fear of dying<br><br>D5: emotional pain | | | Specificity: 88%<br><br>SCI total score at D/C improved prediction of SB over traditional risk factors (Chi-squared 5.597, $p$ = .024, model $p$ = .001 | discriminant validity, and state versus trait properties assessed.<br><br>Limitations: all PTs INPTPSY, homeless excluded, evaluation by research assistants, not professionals, assessments in person and phone<br><br>Application: SCI predictive of future SB in high-risk INPTPSY following D/C, may not be valuable tool for assessing risk before hospitalization. |

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|---|---|---|---|---|---|---|---|---|
| Nelson et al. (2010). 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).<br><br>Funding: Not disclosed.<br><br>No conflicts or biases recognized.<br><br>Canada | Inferred to be Trans-theoretical model | **Design:** Psychometric study involving data collection from the SIS-MAP.<br><br>**Purpose:** Examination of a new structured clinical interview to facilitate the prevention of SB. | N = 50<br><br>Mean age: 41<br>n GF = 22<br><br>OUTPTPSY<br>DC = not disclosed<br><br>**Inclusion Criteria:** PTs with SI presenting to OUTPTPSY. SIS-MAP given during triage.<br><br>**Exclusion Criteria:** PTs that did not express SI upon presentation. Forensic patients were excluded due to specialized legal criteria for inclusion. | D1: ideation<br><br>D2: management of ideation<br><br>D3: current state of suicidality<br><br>D4: planning for attempts<br><br>D5: comorbidities<br><br>D6: family history<br><br>D7: biological<br><br>D8: protective factors<br><br>D9: clinical ratings<br><br>D10: psychosocial / environmental problems<br><br>OA: SB, INPT | Utilized SIS-MAP to measure SI, assessment of suicide potential and prediction of possible SA & SB<br><br>Assessment of suicide potential in personality disorder and substance abuse. | Canonical discriminant functional analysis (predictive of it PTs were admitted to INPTPSY after assessment) | 74% of groups correctly classified<br><br>Wilks = .749,<br><br>$p < .001$<br><br>Sensitivity: 66.7%<br><br>Specificity: 78.1% | LOE: IV, Grade D<br><br>Strengths: Administered by professionals, large scope of items measured, examines protective and risk factors<br><br>Limitations: Long assessment tool (108 items), not well studied, small sample size which may not be large enough for statistics utilized.<br><br>Application: Additional research required for generalizability. Length od assessment may not be practical in urgent care setting. |
| Perry et al., (2010). Screening tools assessing risk of suicide and self-harm in | Inferred to be Trans-theoretical model | **Design:** Systematic review<br><br>**Purpose:** Assess the validity of SCL, | Ns = 5<br><br>ELD = 11<br><br>DC 1/1980-11/2004 | SCL: 2 (N = 141, 150)<br><br>SPS: 1 (N = 88) | STARD | Sensitivity<br><br>Specificity<br><br>PPV | SLC:<br><br>Sensitivity: 86% | LOE: I, Grade A<br><br>Strengths: Reviewed multiple assessment tools utilizing same measurement, specifically |

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|---|---|---|---|---|---|---|---|---|
| adult offenders: A systematic review.<br><br>Funding: Not disclosed<br><br>No conflicts or biases recognized.<br><br>United Kingdom | | SPS, SCOPE, SPOS to identify SR and SHB in offenders. | **Inclusion Criteria:** Assessment utilizing screening tool, study sample with a mean age of 35 years or less, sample of offenders in criminal justice system, test of reliability or validity of screening tool.<br><br>**Exclusion Criteria:** Unpublished literature (none assessed validity of tool). | SCOPE: 1 (N = 1029)<br><br>SPOS: 1 (N = 152) | | NVP | Specificity: 21%<br><br>PPV: 74%<br><br>NVP: 24%<br><br>SPS:<br><br>Sensitivity: 53%<br><br>Specificity: 78%<br><br>PPV: 74%<br><br>NVP: 78%<br><br>SCOPE:<br><br>Sensitivity: 81%<br><br>Specificity: 71%<br><br>PPV: 94%<br><br>NVP: 55%<br><br>SPOS:<br><br>Sensitivity: 86% | compared specificity and sensitivity in addition to PPV, NVP<br><br>Limitations: Population of offenders only, older studies (only until 2004), study sample mean age ,35 years<br><br>Application: SCOPE and SPS with highest specificity and sensitivity, however, not generalized to emergency settings and length of tools may not be realistic in emergency environment. |

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|---|---|---|---|---|---|---|---|---|
| | | | | | | | Specificity: 80%<br><br>PPV: not reported<br><br>NVP: not reported | |
| Posner et al., (2011). The Columbia-Suicide Severity Rating Scale: Initial validity and internal consistency findings from three multisite studies with adolescents and adults.<br><br>Funding: Not disclosed<br><br>No conflicts or biases recognized.<br><br>United States | Inferred to be Trans-theoretical model | Psychometric evaluation. | N = 124 (adolescent SA)<br><br>N = 312 (medication efficacy trial with depressed adolescents)<br><br>N = 237 (ED adults for psych reason)<br><br>**Inclusion Criteria:** Study 1: Age 12-18 years with SA during 90 days before enrollment. Participants that refused treatment but participated in the study.<br><br>Study 2: Age 11-17 with MDD | D1: passive SI<br><br>D2: Active SI: nonspecific<br><br>D3: Active SI: method, but no intent or plan<br><br>D4: Active SI: method and intent, but no plan<br><br>D5: Active SI: method, intent, and plan<br><br>D6: SA<br><br>D7: Interrupted SA<br><br>D8: Aborted SA | C-SSRS | SAS version 9.1<br><br>SPSS version 19<br><br>convergent, divergent, and predictive validity.<br><br>Sensitivity<br><br>Specificity<br><br>Convergent and divergent validity: Pearson's r<br><br>Internal consistency: Cronbach's alpha | S1: Convergent and divergent validity: r = 0.52, p<0.001<br><br>S2: r = 0.36, p,0.01<br><br>S3: r=0.69, p,0.001<br><br>Sensitivity: 100%<br><br>Specificity: 99.4%<br><br>Internal consistency: Cronbach's alpha of 0.73. | LOE: I, Grade A<br><br>Strengths: included adolescent and adult populations, multi-sites utilized, large sample size<br><br>Limitations: Some assessments self-reported, some completed by clinicians.<br><br>Application: Promising data on the convergent and divergent validity, predictive validity, sensitivity, specificity, sensitivity to change, and internal consistency of C-SSRS. Brief assessment tool may be ideal for urgent care environment. |

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| | | | Study 3: Age 18 and above presenting to ED for psych reasons<br><br>**Exclusion Criteria:** Severe cognitive impairment. | D9: Preparatory acts towards imminent SB<br><br>D10: Self-injurious behavior without SI | | | | |
| VanVeen et al., (2015). Structured assessment of suicide risk in a psychiatric emergency service: Psychometric evaluation of the Nurses' Global Assessment of Suicide Risk Scale (NGASR)<br><br>Funding: No specific grant from any funding agency, commercial or | Inferred to be Trans-theoretical model | **Design:** Psychometric evaluation, Descriptive Study<br><br>**Purpose:** Establish psychometric properties of NGASR, assess feasibility of use in assessing SR. | N = 252<br><br>n = 214 (fully scored)<br><br>Ages: 17-64<br><br>n GF = 115<br><br>n PS = 61<br><br>OUTPTPSY<br><br>DC = 1/2010-5/2010<br><br>**Inclusion Criteria:** PTs over 17 years referred to central psychiatric emergency service of Utrecht.<br><br>**Exclusion Criteria:** Those exhibiting safety concerns, those with whom contact or | D1: hopelessness<br><br>D2: stressful life event<br><br>D3: persecutory beliefs/voices<br><br>D4: depression<br><br>D5: withdrawal<br><br>D6: suicidal intent<br><br>D7: plan<br><br>D8: family history<br><br>D9: loss<br><br>D10: psychosis<br><br>D11: widow | NGSAR<br><br>Acceptability, reliability, predictive validity | Cronbach's alpha<br><br>ICC<br><br>PCA | Reliability: Cronbach's alpha = .45<br><br>Reliability: ICC = .92<br><br>Construct validity:<br><br>PCA = 57.3%<br><br>Criterion validity: NGASR and SIS - $\beta = 0.66$, SE = 0.19, $\beta = .66$, $p = .003$<br><br>Sensitivity: 100% | LOE: VI, Grade D<br><br>Strengths: Large sample size, multidisciplinary assessors, numerous domains assessed<br><br>Limitations: Retrospective studies carry possible bias, number of items make statistical power for factor analysis modest.<br><br>Application: NGASR developed for nurses, long assessment may not be practical for acute care setting |

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| not-for-profit sectors.<br><br>No conflicts or biases recognized.<br><br>Netherlands | | | communication was problematic, those who were unable to understand Dutch. | D12: prior SA<br><br>D13: social deprivation<br><br>D14: ETOH<br><br>D15: terminal illness<br><br>OA: SR | | | Specificity: 38% | |
| Warden et al. (2014). The SAD PERSONS Scale for suicide risk assessment: A systematic review.<br><br>Funding: None identified.<br><br>No conflicts or biases recognized.<br><br>United States | Inferred to be Trans-theoretical model | **Design:** Systematic review<br><br>**Purpose:** Systematically review the SAD in clinical situations | Ns = 9<br><br>ELD = 6<br><br>ED: 6<br><br>TX post SA: 1<br><br>OUTPTPSY: 2<br><br>DC = 1983-4/2012<br><br>**Inclusion Criteria:** Evaluation of performance of SAD in SRA in clinical settings and must be original data. Articles discussing modified versions of SAD. | Modified SPS: 4<br><br>Original SPS: 4<br><br>Original & Modified SPS: 1 | SPS in predicting suicide-related outcomes, completed suicides, repeated suicide attempts, future suicide attempts C-CASA | Sensitivity<br><br>Specificity<br><br>PPV<br><br>NVP | Sensitivity: 23%-100%<br><br>Specificity: 62.9%-64.64%<br><br>PPV: 5.3%-75%<br><br>NPV: 95%-100% | LOE: I, Grade A<br><br>Strengths: Systematic review of nine studies, positive results on predicting need for psychiatric admission<br><br>Limitations: Small sample size of studies, heterogeneity of study populations in studies reviewed lead to questionable generalizability<br><br>Application: Studies assessing SAD are mixed, high degree of variability across outcome measures, |

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|---|---|---|---|---|---|---|---|---|
| | | | **Exclusion Criteria:** Studies not available in English, titles that could not be obtained by authors or library staff. | | | | | generalizability is questionable |

**ASIQ –** Adult Suicidal Ideation Questionnaire**, ASQ –** Ask Suicide Screening Questions**, AUC –** areas under the ROC curves**, BAI –** Beck Anxiety Inventory**, BDI –** Beck Depression Inventory**, BDI-II –** Beck Depression Inventory II**, BHS –** Beck Hopelessness Scale**, BSSI –** Beck Scale of Suicidal Ideation**, C-CASA –** Columbia Classification Algorithm of Suicide Assessment**, CC –** chief complaint**, C-SSRS -** Columbia Suicide Severity Rating Scale**, D** – domain**, DC –** Data collection dates, **DD –** developmental delay**, DTO –** danger to others**, DTS –** danger to self**, ELD –** electronic database**, ED –** emergency department**, INPT-** inpatient admission**, GF –** Gender female**, HD –** Hospital discharge**, ICC – intraclass correlation, INPTPSY –** Inpatient psychiatric setting**, IV –** Independent variable, **LOE –** level of evidence**, MDD** – major depressive disorder, **MR –** mental retardation**, N –** number of participants**, n –** subset of participants**, Ns –** number of studies**, NPV –** negative predictive value**, OA –** outcome assessed**, OUTPTPSY –** Outpatient psychiatric setting**, PedsED –** pediatric emergency department**, PC –** psychiatric comorbidity**, PCA –** principal component analysis**, PHQ-9 –** Patient Health Questionnaire 9**, PPV –** positive predictive value**, PTs –** Patients**, PS –** Psychotic symptoms**, RADS-2 –** Reynolds Adolescent Depression Scale 2nd Edition**, RCT –** randomized controlled trials**, S** - study**, SA –** Suicide attempt**, SAD –** SAD PERSONS scale**, SAMHSA –** The Substance Abuse and Mental Health Services Administration**, SB –** Suicidal behavior**, SBH –** self harm behaviors**, SCL –** suicide checklist**, SCI –** Suicide Crisis Inventory**, SCOPE –** Suicide Concerns for Offenders in Prison Environment**, SI –** Suicidal ideation, **SIQ –** Suicide Ideation Questionnaire**, SIQ-JR –** Suicidal Ideation Questionnaire-Junior**, SIS –** Suicide Intent Scale**, SIS-MAP** – Suicidality Management Assessment and Planning of Care, **SPOS –** Suicide Potential Scale**, SPS –** Suicide Probability Scale**, SR –** suicide risk**, SRA –** suicide risk assessment**, STARD –** Standards for the Reporting of Diagnostic accuracy studies statement**, STS** – Suicide Trigger Scale**, SUB –** Substance abuse**, TX –** treatment center**, VS –** vital signs

*Appendix F*

Table 2
*Synthesis Table*

| **Tool** | NGASR | ASQ | SCI | BHS | SIS | BDI | SAD | C-SSRS | SIS-MAP | SCL | SPS | SCOPE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Author | Van Veen et al. | Ballard et al., Bisconer et al. | Galynker et al. | Bolton et al. | Bolten et al. | Bolten et al. | Bolten et al., Chang et al., Warden et al. | Bolten et al., Posner et al. | Nelson et al. | Perry et al. | Perry et al., Bisconer et al., Warden et al. | Perry et al. |
| Year | 2015 | 2016/2007 | 2016 | 2015 | 2015 | 2015 | 2015/2015/2014 | 2015/2011 | 2010 | 2010 | 2010/2007/2014 | 2010 |
| Number of subjects | 252 | 970/67 | 201 | N/A | N/A | N/A | N/A | N/A/124/312/237 | 50 | N/A | N/A/67/N/A | N/A |
| **Domains** | | | | | | | | | | | | |
| SI | X | X | | X | X | X | X | X | X | X | X | X |
| SA | X | X | | | X | X | X | X | X | X | | X |
| Plan | X | | | X | X | | X | X | | X | | X |
| Hopelessness | X | X | X | X | | X | | | X | X | X | X |
| Future | | | X | X | | X | | | | | | |
| Pain | X | | X | | | | X | X | X | | | |
| Depression | X | | | | | X | | | X | X | X | X |
| Anxiety | X | | X | X | | | | | X | | | |
| Psychosis | X | | | | | | | | X | | | |
| Trauma | X | | | | X | | | X | | | | |

**ASQ –** Ask Suicide Screening Questions**, BDI –** Beck's Depression Inventory, **BHS –** Beck Hopelessness Scale**, C-SSRS –** Columbia-Suicide Severity Rating Scale**, NGASR** – Nurses' Global Assessment of Suicide Risk scale, **OT** – outpatient, **PSY ES** – psychiatric emergency services, **SAD** – SAD PERSONS Scale, **SCI** – Suicide Crisis Inventory, **SCL** – Suicide Checklist, **SCOPE** – Suicide Concerns for Offenders in Prison Environment, **SIS** – Suicide Intent Scale, **SIS-MAP** – The Scale for Impact of Suicidality – Management, Assessment and Planning of Care, **SPS** – Suicide Probability Scale

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Impulsivity | | | | | | X | | X | | X | X | |
| Family | X | X | | X | | | X | | X | | | X |
| Substance Use | X | | | | X | | X | | X | | | |
| **Analysis** | | | | | | | | | | | | |
| Sensitivity | 100% | 97.6%/51% | 64% | 60%-94% | 59%-77% | 77% | 23%/77% | 67%/100% | 78.1% | 70% | 53%/52%/23% | 81% |
| Specificity | 38% | 65.6%/78% | 88% | 42%-52% | 49%-77% | 64% | 89%/39% | 76%/99.4% | 66.7% | 21% | 78%/78%/89% | 71% |
| Validity | + | + | – | + | + | + | + | + | + | + | – | + |
| Reliability | – | – | – | + | + | + | – | + | + | – | + | – |
| Internal Consistency | – | + | + | + | – | + | + | + | NA | + | + | NA |
| Cronbach's alpha | .45 | .98 | .97 | .97 | .32 | .94 | .90 | .83 | NA | .80 | .92 | NA |
| **Setting** | | | | | | | | | | | | |
| ED | | X | | X | X | X | X | X | | | | |
| INPTPSY | | X | X | | | | | X | | | X | |
| PSY ES | X | | | | | | | | | | | |
| OT | | | | | | | | X | X | | | |
| Prison | | | | | | | | | | X | X | X |

**ASQ –** Ask Suicide Screening Questions**, BDI –** Beck's Depression Inventory, **BHS –** Beck Hopelessness Scale**, C-SSRS –** Columbia-Suicide Severity Rating Scale**, NGASR** – Nurses' Global Assessment of Suicide Risk scale, **OT** – outpatient, **PSY ES** – psychiatric emergency services, **SAD** – SAD PERSONS Scale, **SCI** – Suicide Crisis Inventory, **SCL** – Suicide Checklist, **SCOPE** – Suicide Concerns for Offenders in Prison Environment, **SIS** – Suicide Intent Scale, **SIS-MAP** – The Scale for Impact of Suicidality – Management, Assessment and Planning of Care, **SPS** – Suicide Probability Scale

*Appendix G*

Figure 1

*The Iowa Model of Evidence-Based Practice*

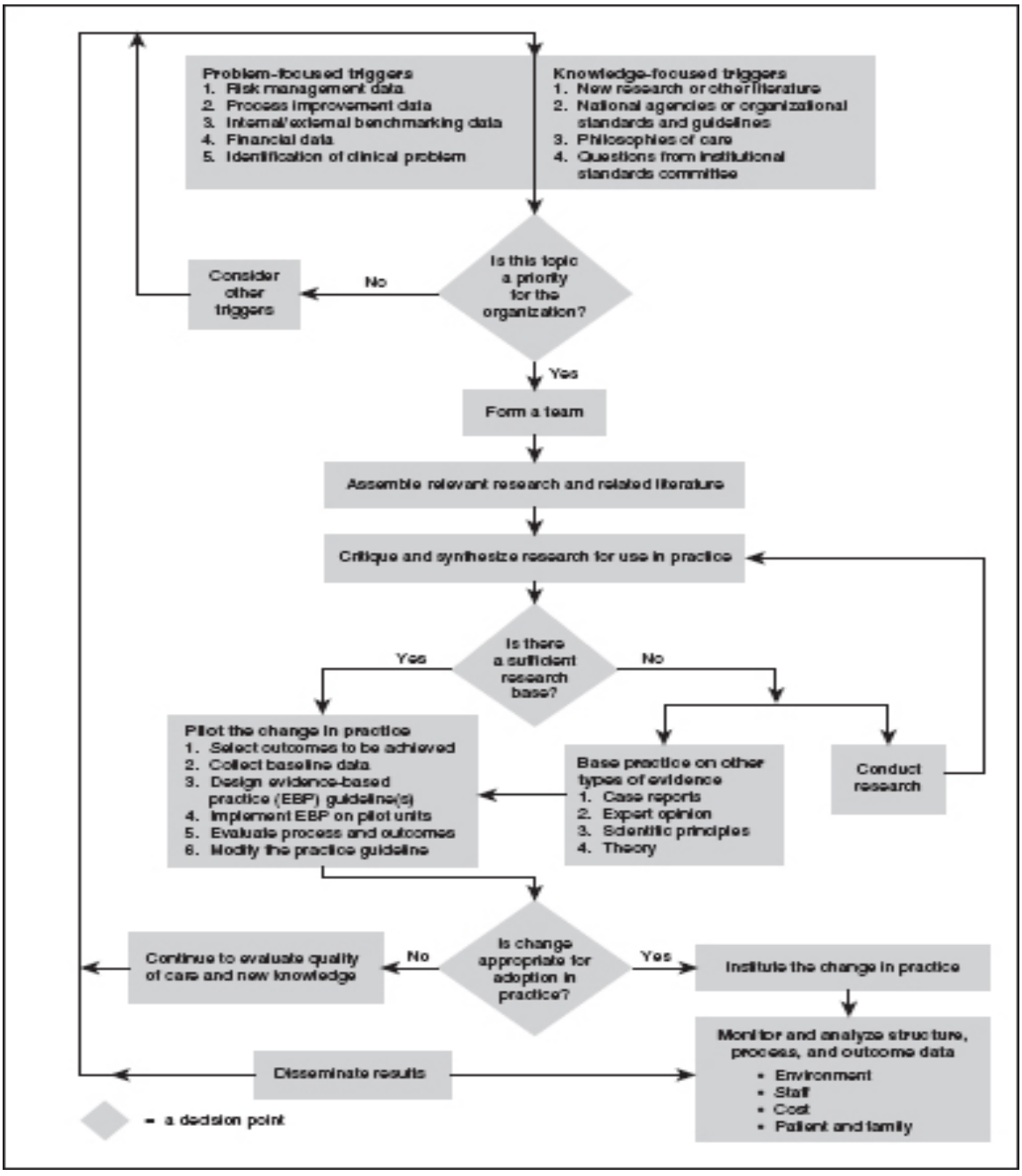


*Figure 1*. The Iowa Model of Evidence-Based Practice. Adapted from "The Iowa Model of Evidence-Based Practice to Promote Quality Care," by M. G. Titler et al., 2001, *Critical Care Nursing Clinics of North America, 13*(4), p. 507.