The Columbia Lighthouse Project/Center for Suicide Risk Assessment

The Columbia Suicide Severity Rating Scale (C-SSRS)

Supporting Evidence

Last Revised
3-25-2017
THE COLUMBIA SUICIDE SEVERITY RATING SCALE (C-SSRS): PSYCHOMETRIC EVIDENCE

TABLE 1: STUDIES SUPPORTING SPECIFIC PSYCHOMETRIC PROPERTIES
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TABLE 3: C-SSRS AS INTERVENTION AND MEASURE OF DIAGNOSIS AND TREATMENT

REPRESENTATIVE PUBLICATIONS FOR C-SSRS USE:

DEMOGRAPHIC AND CLINICAL POPULATIONS, SETTINGS, TREATMENT EFFICACY AND ASSESSMENT GUIDELINES

PEDIATRIC POPULATIONS BY AGE GROUP

MEDICAL SPECIALTIES
   Neurology
   Oncology

PSYCHIATRIC CONDITIONS
   Alzheimer’s
   Autism
   Bipolar Depression
   Complicated Grief
   Psychosis/Schizophrenia
   PTSD
   Sleep

HEALTHCARE SYSTEMS

OUTPATIENT SETTINGS
   Outpatient Psychiatry
   Juvenile Justice
   Integrated Primary Care
   Veterans

IN-PATIENT SETTINGS/EMERGENCY DEPARTMENTS

MEDICATION TREATMENT EFFICACY FOR SUICIDAL OUTCOMES

REVIEWS OF SUICIDE RISK ASSESSMENT TOOLS

GUIDELINES FOR TREATMENT & ASSESSMENT OF SUICIDAL OUTCOMES

LINGUISTIC AND PSYCHOMETRIC VALIDATION OF TRANSLATIONS

CROSS-CULTURAL SETTINGS
COLUMBIA SUICIDE SEVERITY RATING SCALE VERSIONS

C-SSRS CLINICAL PRACTICE SCREENER:
C-SSRS SELF-REPORT:
The Columbia Suicide Severity Rating Scale (C-SSRS): Psychometric Evidence

Table 1: Studies Supporting Specific Psychometric Properties

<table>
<thead>
<tr>
<th>Psychometric Property</th>
<th>Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical Utility</strong></td>
<td></td>
</tr>
<tr>
<td>Predictive and/or Incremental Validity</td>
<td>Brent et al., 2009^; Posner et al., 2011*^; Mundt et al., 2013*; Arias et al. 2013*; Greist et al. 2014*; Gipson et al., 2015^; Horwitz et al., 2015*; Brown et al., 2015*; Arias et al., 2016*; Conway et al. 2016^; Madan et al. 2016*</td>
</tr>
<tr>
<td>Sensitivity to Change</td>
<td>Posner et al., 2011*; Ionescu et al., 2016*</td>
</tr>
<tr>
<td>Sensitivity and Specificity</td>
<td>Posner et al., 2011*; Mundt et al., 2013*; Viguera et al. 2015*; Madan et al. 2016*</td>
</tr>
<tr>
<td>Positive and Negative Predictive Value (PPV &amp; NPV)</td>
<td>Mundt et al 2013*; Viguera et al 2015*</td>
</tr>
<tr>
<td>Reliability (internal consistency)</td>
<td>Posner et al., 2011*^; Gunes et al. 2015^; Pai et al. 2015*; Madan et al. 2016*</td>
</tr>
<tr>
<td>Reliability (inter-rater; multi-method agreement)</td>
<td>Kerr et al., 2013^; Brent et al., 2009^; Hesdorffer et al., 2013*; Arias et al., 2013*; Brown et al. 2015*; Gunes et al. 2015^</td>
</tr>
<tr>
<td>Internal Structure (Factor Analysis)</td>
<td>Al-Halabi et al ., 2016b*; Madan et al. 2016*</td>
</tr>
<tr>
<td>Convergent Validity &amp; Accuracy</td>
<td>Posner et al., 2011*; Kerr et al., 2013^; Gunes et al. 2015^; Pai et al. 2015*; Youngstrom et al. 2015*; Brown et al ., 2015*; Madan et al.2016*</td>
</tr>
<tr>
<td>Divergent &amp; Discriminant Validity</td>
<td>Posner et al., 2011*; Kerr et al., 2013^; Gunes et al. 2015</td>
</tr>
<tr>
<td>Cross-Cultural Validation</td>
<td>Danish (Conway et al. 2016^); Korean (Pai et al. 2015*); Turkish (Gunes et al. 2015*); Spanish (Al-Halabi et al ., 2016ab*)</td>
</tr>
</tbody>
</table>

* studies include adult samples; ^ studies include pediatric samples
<table>
<thead>
<tr>
<th>Predictor</th>
<th>Criterion</th>
<th>Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>None Reported</td>
<td>Actual, interrupted or aborted attempts</td>
<td>All patients: 0.8% incidence rate, N=4975 Psychiatric patients: 1.1% incidence rate, N=3184</td>
</tr>
<tr>
<td>Wish to Be Dead</td>
<td>Actual, interrupted or aborted attempts</td>
<td>OR= 6.21, 95% CI = 4.18 – 9.23, p &lt;0.001 OR= 4.99, 95% CI = 3.29 – 7.56, p &lt;0.001</td>
</tr>
<tr>
<td>Non-Specific Active Thoughts</td>
<td>Actual, interrupted or aborted attempts</td>
<td>OR= 6.69, 95% CI = 4.16 – 10.76, p &lt;0.001 OR= 5.53, 95% CI = 3.38-9.04, p &lt;0.001</td>
</tr>
<tr>
<td>Active with any methods (not plan) w/o intent to act</td>
<td>Actual, interrupted or aborted attempts</td>
<td>OR= 11.16, 95% CI = 7.43-16.76, p &lt;0.001 OR= 8.36, 95% CI = 5.44-12.84, p &lt;0.001</td>
</tr>
<tr>
<td>Active with Some Intent to Act, without specific plan</td>
<td>Actual, interrupted or aborted attempts</td>
<td>OR= 19.27, 95% CI = 12.97 – 28.63, p &lt;0.001 OR= 15.24, 95% CI = 10.07-23.09, p &lt;0.001</td>
</tr>
<tr>
<td>Active with specific plan and intent</td>
<td>Actual, interrupted or aborted attempts</td>
<td>OR= 25.53, 95% CI = 16.94 – 38.47, p &lt;0.001 OR= 18.70, 95% CI = 12.16 – 28.76, p &lt;0.001</td>
</tr>
<tr>
<td>Baseline worst-point</td>
<td>Attempts</td>
<td>OR=1.45, 95% CI=1.07-1.98, p=0.02</td>
</tr>
<tr>
<td>Lifetime severity</td>
<td>Attempts</td>
<td>OR=1.43, 95% CI=0.99-2.05, p=0.05</td>
</tr>
<tr>
<td>Severity 4-5 (any intent to act)</td>
<td>Attempts</td>
<td>OR=3.26, 95% CI=1.02-10.45, p=0.047</td>
</tr>
<tr>
<td>Ideation severity 1 to 5</td>
<td>Attempt</td>
<td>OR= 1.51, 95% CI= 1.24-1.84, p&lt;0.001</td>
</tr>
<tr>
<td><strong>Arias et al. 2016</strong></td>
<td><strong>Current ideation severity 4 or 5 (with intent to die)</strong></td>
<td>Actual attempt or suicide 6 weeks post-ED visit</td>
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<td>----------------------------------------------------------</td>
<td>-----------------------------------------------</td>
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<tr>
<td></td>
<td></td>
<td>Actual, interrupted, aborted attempts, suicide or preparatory behavior</td>
</tr>
<tr>
<td><strong>Madan et al. 2016</strong></td>
<td><strong>Most severe ideation</strong></td>
<td>Any suicide behavior within 6 months post hospitalization</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Psychiatric hospitalization within 6 month post initial hospitalization</td>
</tr>
</tbody>
</table>

### Predictive Validity - Suicidal Behavior

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Criterion</th>
<th>Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Greist et al. 2014</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attempt</td>
<td>Actual, interrupted or aborted attempts</td>
<td>OR=4.57, 95% CI = 3.6-5.7, p &lt; 0.001</td>
</tr>
<tr>
<td><strong>Interrupted Attempt</strong></td>
<td>Actual, interrupted or aborted attempts</td>
<td>OR=5.55, 95% CI = 4.4-7.0, p &lt; 0.001</td>
</tr>
<tr>
<td>Aborted Attempt</td>
<td>Actual, interrupted or aborted attempts</td>
<td>OR=5.09, 95% CI = 4.1-6.4, p &lt; 0.001</td>
</tr>
<tr>
<td>Preparatory behavior</td>
<td>Actual, interrupted or aborted attempts</td>
<td>OR=5.69, 95% CI = 4.3-7.5, p &lt; 0.001</td>
</tr>
<tr>
<td><strong>Horwitz et al. 2015</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attempt</td>
<td>Attempt</td>
<td>OR=4.80, 95% CI = 2.23-10.32, p &lt; 0.001</td>
</tr>
<tr>
<td>NSSIB item</td>
<td>Attempt</td>
<td>OR=3.12, 95% CI = 1.36-7.19, p &lt; 0.01</td>
</tr>
<tr>
<td><strong>Gipson et al. 2014</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSSIB item</td>
<td>Return ER visit</td>
<td>OR = 1.52; 95% CI, 1.08-2.12, p &lt; .05</td>
</tr>
<tr>
<td></td>
<td>Attempt</td>
<td>$X^2 = 4.131$, df = 1, p = 0.04</td>
</tr>
</tbody>
</table>

See also: Conway et al 2016.
### Incremental Validity and Accuracy

<table>
<thead>
<tr>
<th>Study</th>
<th>Ideation Type</th>
<th>Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brent et al. (2009)</td>
<td>Treatment resistant, depressed adolescent suicide attempters (N=334, ages 12-18)</td>
<td>Higher rates of suicidal (20.8% vs. 8.8%, chi squared= 9.18, df=1, p&lt;0.002) and non-suicidal self-injury (17.6% vs. 2.2%, chi squared= 23.47, df=1, p&lt;0.001) detected with systematic monitoring</td>
</tr>
</tbody>
</table>
| Brown et al. (2015)           | psychiatric ER patients (N=250)                                               | 18% (n=23) of patients with a suicide attempt in the past week misclassified or missed by clinical assessment.  
  Agreement with clinical assessment for suicide attempts (K=0.76, p=<.001)  
  Agreement with clinical assessment of non-suicidal self-injurious behavior (K=0.72, p=<.001) |
| Horwitz et al. (2014)         | Young adult psychiatric emergency patients (N=473)                            | Suicidal ideation added incremental validity to the prediction of future suicide attempts beyond the past suicide attempt, $X^2 (1) = 7.54, p= .006$ |
| Arias et al. (2013)           | 497 ER adult patients with suicidal thoughts or attempt(s)                    | 41% increase in the detection of suicide attempts compared to chart reviews (59% vs. 18%, difference of 41%, 95% CI= 28-55, p<0.001) |

See also: Conway et al 2016.

### Reliability - Suicidal Ideation

(Inter-rater and multi-method agreement)

<table>
<thead>
<tr>
<th>Study</th>
<th>Ideation Type</th>
<th>Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brent et al. (2009)</td>
<td><strong>suicidal ideation ranging from 0 to 5</strong> (from no ideation to suicidal ideation with intent and a clear plan) monitored weekly</td>
<td>ICC = .09, p&lt; 0.001</td>
</tr>
<tr>
<td>Youngstrom et al. (2015)</td>
<td>Accuracy calibrated against “missing gold standard” latent class-derived ideation and behavior categories</td>
<td>$\kappa &gt; 0.7$</td>
</tr>
<tr>
<td>Reference</td>
<td>Description</td>
<td>Reliability Score</td>
</tr>
<tr>
<td>-----------------------------------</td>
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</tbody>
</table>
| Gunes et al. (2015)               | *Inter-rater reliability for the most severe ideation scores in the last month and lifetime were good* | Lifetime $\kappa = 0.91$  
  Recent $\kappa = 0.76$ |
| Hesdorffer et al. (2013)          | Agreement between the MINI, C-SSRS and eC-SSRS for lifetime suicidal ideation                          | $\kappa = 0.80$, 95% CI = 0.72-0.89 |
| **Reliability - Suicidal Behavior**  |                                                                                                         |                  |
| Brown et al. (2015)               | Agreement with clinical assessment for attempts                                                        | $\kappa = 0.76$, $P < .001$ |
|                                   | Agreement with clinical assessment for non-suicidal self-injurious behavior                            | $\kappa = 0.72$, $P < .001$ |
| Youngstrom et al. (2015)          | Accuracy of attempt: calibrated against latent class-derived categories                                 | $\kappa > 0.8$   |
| Brent et al. (2009)               | Inter-rater reliability for a rating of suicidal behavior, ranging from 0 to 5 (no behavior to multiple attempts during the assessment period) using the Columbia Classification Algorithm of Suicide Assessment | 100% agreement   |
| Kerr et al. (2013)                | Inter-rater agreement for distinction among actual, aborted, interrupted attempts, preparatory acts and any other act | $\kappa = 0.88$   |
| Hesdorffer et al. (2013)          | Agreement between the MINI, C-SSRS and eC-SSRS for lifetime suicidal behavior                          | $\kappa = 0.67$, 95% CI = 0.53-0.80 |
# The Columbia Suicide Severity Rating Scale (C-SSRS): Impact in Public Health and Diagnostic and Treatment-Monitoring Effectiveness

## Table 3: C-SSRS as Intervention and Measure of Diagnosis and Treatment

<table>
<thead>
<tr>
<th>Decrease in Suicide Rate: C-SSRS as Intervention</th>
<th>Out-Patient Mental Health</th>
<th>Active Duty: US Marines</th>
<th>States: Utah</th>
<th>Active Duty: US Army</th>
</tr>
</thead>
<tbody>
<tr>
<td>Esposito, 2015</td>
<td>• Centerstone - the largest provider of community-based outpatient mental health care in the U.S.</td>
<td>• Following training of all support staff in the C-SSRS at 16 USMC installations and implementation of mandatory C-SSRS screening by the non-healthcare personnel, including legal services, suicides in the USMC dropped by 22%, from 45 in 2013 to 34 in 2014.</td>
<td>US: UT Dept. of Human Services, 2015</td>
<td>• For the first time reversed the rising suicide trend since implementing the C-SSRS as part of the comprehensive Zero Suicide program in 2015.</td>
</tr>
<tr>
<td></td>
<td>• The C-SSRS administered to every client at every service delivery point as part of a comprehensive Zero Suicide prevention program.</td>
<td>• At the end of 2-4 months of treatment for PTSD in active duty soldiers (N=1206), those with greater improvement in PTSD had fewer suicidal ideation symptoms on the C-SSRS.</td>
<td></td>
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<tr>
<td></td>
<td>• In the first 20 months post-implementation, the Tennessee facilities saw a nearly 65% reduction in the suicide rate, from 3.1 to 1.1 per 10,000 clients.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Note:** All contributions are based on published data and personal communications. The effectiveness of the C-SSRS in reducing suicide rates and improving mental health outcomes is supported by various studies and practical implementations.
### References for Psychometric Evidence and Clinical Outcomes


Representative Publications for C-SSRS Use:

**Demographic and Clinical Populations, Settings, Treatment Efficacy and Assessment Guidelines**

**Pediatric Populations by Age Group**

**Ages 5-11**


**Ages 6-12**


**Ages 7-13**


**Ages 6-17**


**Ages 6-18**


**Ages 7-17**


**Ages 10-18**

Ages 12-17


Ages 7-18 (for pediatric sub-sample; paper also included studies with adults)

Ages 12-17.5

Ages 12-18

Ages 12-18


Ages 12-17

Ages 13-17

Ages 14-18

Ages 14-19


Ages 15-20

Ages 15-24

Young Adults
Ages 15-24

Ages 20-22

Medical Specialties

Neurology


**Oncology**


**Psychiatric Conditions**

**Alzheimer’s**


**Autism**


**Bipolar Depression**


**Complicated Grief**


**Psychosis/Schizophrenia**


**PTSD**


**Sleep**


**Healthcare Systems**


**Outpatient Settings**

**Outpatient Psychiatry**


**Juvenile Justice**


**Integrated Primary Care**

Veterans


In-Patient Settings/Emergency Departments


Medication Treatment Efficacy for Suicidal Outcomes


Reviews of Suicide Risk Assessment Tools


Guidelines for Treatment & Assessment of Suicidal Outcomes


US Food and Drug Administration. Suicidal Ideation and Behavior: Prospective Assessment of Occurrence in Clinical Trials.

Linguistic and Psychometric Validation of Translations


Al-Halabi, S., Fernández-Peláez, AD, Burón, P., Riesco, E., Rodríguez-Revuelta, J. Posner, K. Oquendo, M., García-Portilla, MP, Saiz., P. and Bobes, J (September, 2016). In Search of the Internal Structure of the Columbia Suicide Severity Rating Scale (C-SSRS): A Confirmatory Factor Analysis Approach. 16th European Symposium on Suicide Suicidal Behavior, Oviedo, Spain. [Spanish]


Cross-Cultural Settings

Latin America (Spanish)

Argentina

Australia
China

Croatia

Ethiopia

France

Germany

Hungary

Indonesia

India


Korea

Spain

_Sri Lanka_

Columbia Suicide Severity Rating Scale Versions

C-SSRS clinical practice screener:

C-SSRS self-report: