The Columbia Suicide Severity Rating Scale (C-SSRS)

Supporting Evidence

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The Columbia Suicide Severity Rating Scale (C-SSRS): Psychometric Evidence

Table 1: Studies Supporting Specific Psychometric Properties

<table>
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<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^</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*</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*</td>
</tr>
<tr>
<td>Reliability (inter-rater; multi-method agreement)</td>
<td>Kerr et al., 20136; 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*</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*</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 2: Psychometric Properties of C-SSRS Ideation and Behavior Predictors with Coefficients

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Criterion</th>
<th>Coefficients</th>
<th>Notes</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>
<td></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>
<td></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>
<td></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>
<td></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>
<td></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>
<td></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>
<td></td>
</tr>
<tr>
<td>Lifetime severity</td>
<td>Attempts</td>
<td>OR=1.43, 95% CI=0.99-2.05, p=0.05</td>
<td></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>
<td></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>
<td></td>
</tr>
<tr>
<td>Arias et al. 2016</td>
<td>Current ideation severity 4 or 5 (with intent to die)</td>
<td>Actual attempt or suicide 6 weeks post-ED visit</td>
<td>OR=1.70 95% CI 1.18-2.44, p =.004</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------------------------</td>
<td>------------------------------------------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Actual, interrupted, aborted attempts, suicide or preparatory behavior</td>
<td>Actual, interrupted, aborted attempts, suicide or preparatory behavior</td>
<td>OR =1.52 95%CI 1.23-1.86 p &lt; .001</td>
</tr>
</tbody>
</table>

**Predictive Validity - Suicidal Behavior**

<table>
<thead>
<tr>
<th>Greist et al. 2014</th>
<th>Predictor</th>
<th>Criterion</th>
<th>Coefficients</th>
</tr>
</thead>
<tbody>
<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>
<td></td>
</tr>
<tr>
<td>Interrupted Attempt</td>
<td>Actual, interrupted or aborted attempts</td>
<td>OR=5.55, 95% CI = 4.4-7.0, p&lt;0.001</td>
<td></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>
<td></td>
</tr>
<tr>
<td>Preparatory behavior</td>
<td>Actual, interrupted or aborted attempts</td>
<td>OR=5.68, 95% CI = 4.3-7.5, p&lt;0.001</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Horwitz et al. 2015</th>
<th>Predictor</th>
<th>Criterion</th>
<th>Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attempt</td>
<td>Attempt</td>
<td>OR=4.80, 95% CI = 2.23-10.32, p&lt;0.001</td>
<td></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>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gipson et al. 2014</th>
<th>NSSIB item</th>
<th>Return ER visit</th>
<th>OR = 1.52; 95% CI, 1.08-2.12, p&lt;.05</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Attempt</td>
<td>$X^2 = 4.131, df = 1, p = 0.04$</td>
<td></td>
</tr>
</tbody>
</table>

*Also see: 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>
<tr>
<td>Brown et al. (2015)</td>
<td>psychiatric ER patients (N=250)</td>
<td>18% (n=23) of patients with a suicide attempt in the past week misclassified or missed by clinical assessment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agreement with clinical assessment for suicide attempts (K=0.76, p=&lt;.001)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agreement with clinical assessment of non-suicidal self-injurious behavior (K=0.72, p=&lt;.001)</td>
</tr>
<tr>
<td>Horwitz et al. (2014)</td>
<td>Young adult psychiatric emergency patients (N=473)</td>
<td>Suicidal ideation added incremental validity to the prediction of future suicide attempts beyond the past suicide attempt, X^2 (1) = 7.54, p=.006</td>
</tr>
<tr>
<td>Arias et al. (2013)</td>
<td>497 ER adult patients with suicidal thoughts or attempt(s)</td>
<td>41% increase in the detection of suicide attempts compared to chart reviews (59% vs. 18%, difference of 41%, 95% CI= 28-55, p&lt;0.001</td>
</tr>
</tbody>
</table>

Also see: 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>suicidal ideation ranging from 0 to 5 (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>κ &gt; 0.7</td>
</tr>
<tr>
<td>Reference</td>
<td>Description</td>
<td>Results</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>Gunes et al. (2015)</td>
<td><em>Inter-rater reliability for the most severe ideation scores in the last month and lifetime were good</em></td>
<td>Lifetime $\kappa = 0.91$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recent $\kappa = 0.76$</td>
</tr>
<tr>
<td>Hesdorffer et al. (2013)</td>
<td><em>Agreement between the MINI, C-SSRS and eC-SSRS for lifetime suicidal ideation</em></td>
<td>$\kappa = 0.80$, 95% CI = 0.72-0.89</td>
</tr>
</tbody>
</table>

**Reliability - Suicidal Behavior**

<table>
<thead>
<tr>
<th>Reference</th>
<th>Description</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown et al. (2015)</td>
<td><em>Agreement with clinical assessment for attempts</em></td>
<td>$\kappa = 0.76$, $P &lt; .001$</td>
</tr>
<tr>
<td></td>
<td><em>Agreement with clinical assessment for non-suicidal self-injurious behavior</em></td>
<td>$\kappa = 0.72$, $P &lt; .001$</td>
</tr>
<tr>
<td>Youngstrom et al. (2015)</td>
<td><em>Accuracy of attempt: calibrated against latent class-derived categories</em></td>
<td>$\kappa &gt; 0.8$</td>
</tr>
<tr>
<td>Brent et al. (2009)</td>
<td><em>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</em></td>
<td>100% agreement</td>
</tr>
<tr>
<td>Kerr et al. (2013)</td>
<td><em>Inter-rater agreement for distinction among actual, aborted, interrupted attempts, preparatory acts and any other act</em></td>
<td>$\kappa = 0.88$</td>
</tr>
<tr>
<td>Hesdorffer et al. (2013)</td>
<td><em>Agreement between the MINI, C-SSRS and eC-SSRS for lifetime suicidal behavior</em></td>
<td>$\kappa = 0.67$, 95% CI = 0.53-0.80</td>
</tr>
</tbody>
</table>
## The Columbia Suicide Severity Rating Scale (C-SSRS): Suicide and Other Clinical Outcomes

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

<table>
<thead>
<tr>
<th>Decrease in Suicide Rate: C-SSRS as Intervention</th>
<th>Details</th>
</tr>
</thead>
</table>
| **Out-Patient Mental Health**<br>Esposito, 2015 | - Centerstone - the largest provider of community-based outpatient mental health care in the U.S.  
- The C-SSRS administered to every client at every service delivery point as part of a comprehensive Zero Suicide prevention program.  
- 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. |
| **Active Duty: US Marines**<br>Seck, 2015 | - 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. |
| **States: Utah**<br>US: UT Dept. of Human Services, 2015 | - **For the first time** reversed the rising suicide trend since implementing the C-SSRS as part of the comprehensive Zero Suicide program in 2015. |
| **Active Duty: US Army**<br>Adam Walsh, CIV DODHRA DSPO (US), (2015, personal communication) | - 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. |
### Table 3: (Continued)

<table>
<thead>
<tr>
<th>C-SSRS as an Effective Measure for Diagnosis &amp; Treatment</th>
<th>Veterans</th>
<th>Legislation et al., 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>- The association of specific PTSD symptoms with suicidal ideation and behavior suggested individual PTSD symptoms as treatment target for reducing suicidal outcomes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Veterans</td>
<td>Harvey et al. (2014) (suicide analyses in preparation)</td>
<td></td>
</tr>
<tr>
<td>- Preliminary analyses show higher prevalence of suicidal ideation and behavior among the Vets with Bipolar Disorder than Schizophrenia.</td>
<td></td>
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<tr>
<td>- Different patterns of association with medical, psychiatric disorders and demographic characteristics between BP and SZ groups</td>
<td></td>
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</tr>
<tr>
<td><strong>Medication Treatment Efficacy</strong></td>
<td>Ionescu et al. (2016)</td>
<td></td>
</tr>
<tr>
<td>- Ketamine treatment effective for suicidal ideation (SI) in adults</td>
<td></td>
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</tr>
<tr>
<td>- SI severity improved independent of acute decrease in depression and SI intensity improved even if SI severity un-remitted</td>
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<tr>
<td>Prakash et al. (2012)</td>
<td></td>
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<tr>
<td>- Duloxetine was effective in treating suicidal ideation among children ages 7-17 with major depression</td>
<td></td>
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<tr>
<td>- Distinguished children with improvement and deterioration</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
References for Psychometric Evidence and Clinical Outcomes


Representative Publications for C-SSRS Use:

Demographic and Clinical Populations, Settings, Treatment Response and Assessment Guidelines

Pediatric Populations by Age Group

**Ages 5-11**


**Ages 6-12**

Buchanan, J., Burke, T., Camacho, K., Yershova, K., Lazzaretto, D., Posner, K. (2013) Preschool Bullying and Victimization as Predictors of Suicidal Ideation in School Age: 6-year Follow-Up of the Preschool Attention Deficit/Hyperactivity Disorder Treatment Study (PATS). *1st Annual Meeting of the International Academy for Suicide Research, Montreal, Canada.*

**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; study also includes 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

Autism


Bipolar Depression


Complicated Grief


Psychosis


PTSD

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., Garcia-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

Korea

Spain

Sri Lanka