The Columbia Suicide Severity Rating Scale (C-SSRS)

Supporting Evidence

Last Revision
11-2-2016
## 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>Predictive and/or Incremental Validity</td>
<td>Brent et al., 2009^; Posner et al., 2011^<em>; Mundt et al., 2013</em>; 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^<em>; Gunes et al. 2015^; Pai et al. 2015</em></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>
</tr>
</thead>
<tbody>
<tr>
<td>None Reported</td>
<td>Actual, interrupted or aborted attempts</td>
<td>All patients: 0.8% incidence rate, N=4975</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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></td>
<td>Actual, interrupted and aborted attempts</td>
<td>OR=1.34, 95% CI=1.05-1.70, 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></td>
<td>Actual, interrupted and aborted attempts</td>
<td>OR= 3.26, 95% CI=1.07-7.12, p=0.036</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>Study</td>
<td>Predictor</td>
<td>Criterion</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------------</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>
</tr>
<tr>
<td></td>
<td></td>
<td>Actual, interrupted, aborted attempts, suicide or preparatory behavior</td>
</tr>
<tr>
<td>Greist et al. 2014</td>
<td>Attempt</td>
<td>Actual, interrupted or aborted attempts</td>
</tr>
<tr>
<td></td>
<td>Interrupted Attempt</td>
<td>Actual, interrupted or aborted attempts</td>
</tr>
<tr>
<td></td>
<td>Aborted Attempt</td>
<td>Actual, interrupted or aborted attempts</td>
</tr>
<tr>
<td></td>
<td>Preparatory behavior</td>
<td>Actual, interrupted or aborted attempts</td>
</tr>
<tr>
<td>Horwitz et al. 2015</td>
<td>Attempt</td>
<td>Attempt</td>
</tr>
<tr>
<td></td>
<td>NSSIB item</td>
<td>Attempt</td>
</tr>
<tr>
<td>Gipson et al. 2014</td>
<td>NSSIB item</td>
<td>Return ER visit</td>
</tr>
<tr>
<td></td>
<td>Attempt</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>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>
<td></td>
</tr>
<tr>
<td>Brown et al. (2015)</td>
<td>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=&lt;.001) Agreement with clinical assessment of non-suicidal self-injurious behavior (K=0.72, p=&lt;.001)</td>
<td></td>
</tr>
<tr>
<td>Horwitz et al. (2014)</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>
<td></td>
</tr>
<tr>
<td>Arias et al. (2013)</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>
<td></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>Authors</td>
<td>Study Description</td>
<td>Reliability Measure</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>Authors</th>
<th>Study Description</th>
<th>Reliability Measure</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>Veterans</th>
<th>Medication Treatment Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legarreta et al., 2015</td>
<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>Harvey et al. (2014) (suicide analyses in preparation)</td>
<td>Preliminary analyses show higher prevalence of suicidal ideation and behavior among the Vets with Bipolar Disorder than Schizophrenia. Different patterns of association with medical, psychiatric disorders and demographic characteristics between BP and SZ groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ketamine treatment effective for suicidal ideation (SI) in adults SI severity improved independent of acute decrease in depression and SI intensity improved even if SI severity un-remitted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prakash et al. (2012)</td>
<td>Duloxetine was effective in treating suicidal ideation among children ages 7-17 with major depression 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., 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

Korea

Spain

Sri Lanka