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The Columbia-Suicide Severity Rating Scale: Associations between interrupted, aborted, and actual suicide attempts among adolescent inpatients☆

Ryan M. Hill[a,*], Claire E. Hatkevich[b], Iram Kazimi[a], Carla Sharp[b]

[a] Department of Psychiatry and Behavioral Sciences, The University of Texas Health Science Center at Houston, Houston, TX, USA
[b] Department of Psychology, University of Houston, Houston, TX, USA

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ABSTRACT

The Columbia-Suicide Severity Rating Scale divides suicide attempt behaviors into actual, interrupted, and aborted attempts, but limited data have been reported regarding associations between interrupted, aborted, and actual attempts. This study provided initial data on the ability of interrupted and aborted attempts to estimate the frequency of actual suicide attempts. Participants were adolescent psychiatric inpatients (59.9% female), 12–17 years (mean = 14.73, SD = 1.62). Results suggest that interrupted and aborted suicide attempts are associated with the frequency of actual suicide attempts, controlling for suicidal ideation and depressive symptoms. Future research should evaluate whether interrupted and aborted attempts prospectively predicting actual suicide attempts.

1. Introduction

A new "gold standard" has emerged for the assessment of suicide-related behaviors in both clinical and research settings: the Columbia-Suicide Severity Rating Scale (C-SSRS; Posner et al., 2011). The C-SSRS standardizes the assessment of a broad range of relevant behaviors, including the severity and intensity of suicidal ideation, suicide attempts, and suicide attempt lethality (Posner et al., 2011). Empirical research on the psychometric properties of the C-SSRS provides support for the validity of this measure in assessing suicide-related behaviors in both adolescent and adult samples (e.g., Brent et al., 2009; Horwitz et al., 2015; Posner et al., 2011).

The emergence of the C-SSRS resulted in greater attention to the assessment of interrupted and aborted suicide attempts, distinct from actual suicide attempts. The C-SSRS classification framework divides suicide attempt behaviors into three mutually exclusive categories: Actual attempts are defined as potentially self-injurious or harmful acts with non-zero intent to die (Posner et al., 2011). The C-SSRS distinguishes actual attempts from interrupted attempts, potentially self-injurious acts interrupted by an external circumstance (e.g., an adolescent prepares to jump off a ledge but is interrupted by a parent), and aborted attempts, potentially self-injurious acts in which someone ceases their own action to die (e.g., an adolescent prepares to jump off a ledge but elects not to; Posner et al., 2011). Previous research with undergraduates found no significant differences in suicide risk markers between students with actual suicide attempts (with or without aborted/interrupted suicide attempts) and individuals with aborted or interrupted suicide attempts alone (Burke et al., 2016). That study did not evaluate whether actual suicide attempts were associated with interrupted and aborted attempts after covarying for suicidal ideation and did not consider aborted and interrupted suicide attempts separately.

To date, little empirical data have been provided to inform how best to utilize interrupted and aborted attempts for accurate suicide risk assessment. For example, when assessing risk, should interrupted and aborted attempts be evaluated as equally, more, or less indicative of risk than actual attempts? This study provides descriptive data on the rates of and associations between interrupted, aborted, and actual attempts among a sample of adolescent psychiatric inpatients, as well as whether interrupted and aborted attempts offer incremental validity in estimating a history of lifetime actual suicide attempts, after covarying for suicidal ideation and depressive symptoms. Given the association between past suicide attempts and future suicidal behavior, lifetime history of suicide attempts is used as a proxy for future suicide risk. This study is the first step toward better understanding the role of interrupted and aborted attempts in suicide risk assessment.

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* Correspondence to: Department of Psychiatry and Behavioral Sciences, The University of Texas Health Science Center at Houston, 1941 East Road, Suite 2316, Houston, TX 77054.
E-mail address: Ryan.M.Hill@uth.tmc.edu (R.M. Hill).

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Table 1
Number, percentage, and clinical characteristics of actual, interrupted, and aborted non-attempters, single attempters, and multiple attempters.

Variable	n	%	Depressive Symptoms M (SD)	Suicidal Ideation M (SD)	% with Actual Attempt	% with Interrupted Attempt	% with Aborted Attempt
Actual Attempts							
0	64	45.1%	18.59 (*11.98*)[a]	11.33 (*11.42*)[ab]	–	15.6%	12.5%
1	41	28.9%	23.77 (*12.71*)	19.81 (*12.30*)[ac]	–	46.3%	34.1%
> 1	37	26.1%	28.19 (*12.75*)[a]	28.01 (*9.78*)[bc]	–	78.4%	64.9%
Interrupted Attempts							
0	84	59.2%	19.12 (*13.01*)[ab]	13.15 (*12.52*)[ab]	35.7%	–	18.1%
1	43	30.3%	26.53 (*10.23*)[a]	24.15 (*10.23*)[a]	76.7%	–	39.5%
> 1	15	10.6%	29.60 (*11.90*)[b]	28.73 (*10.89*)[b]	100%	–	66.7%
Aborted Attempts							
0	96	67.6%	19.73 (*13.49*)[ab]	14.47 (*13.33*)[ab]	41.7%	32.3%	–
1	30	21.1%	26.36 (*9.28*)[a]	23.51 (*8.89*)[a]	83.3%	63.3%	–
> 1	16	11.3%	31.63 (*9.19*)[b]	29.94 (*7.47*)[b]	81.3%	50.0%	–

Note. Identical subscripts indicate significant differences.

2. Methods

This study was conducted as approved by the appropriate institutional review boards as part of a larger IRB-approved cross-sectional study of suicide risk among adolescent psychiatric inpatients. Adolescent participants were recruited from consecutively admitted inpatients at a university-affiliated acute-care psychiatric hospital in a large urban area. Parents provided informed consent for their adolescent child to participate. If adolescents provided informed assent, they completed a series of questionnaires and interviews prior to discharge from the inpatient unit. Of those with parental consent, 67 adolescents declined participation, 41 were excluded due to severe psychosis and/or intellectual disability, and 168 were discharged prior to providing assent, resulting in a final sample of 398 adolescents. As the C-SSRS was introduced later in the study, data for the present analysis were drawn from a subset of adolescents (n = 142) who were administered the C-SSRS. There were no significant differences with respect to demographics or clinical characteristics of those who were or were not administered the C-SSRS.

Participants (59.9% female) ranged in age from 12 to 17 years (mean = 14.73, SD = 1.62) and identified as Hispanic (40.8%), Caucasian (26.1%), African American or Black (22.5%), multiracial (5.6%), Southeast Asian (2.1%), and Native American (.7%), and other (1.4%).

2.1. Measures

2.1.1. Columbia-Suicide Severity Rating Scale

The C-SSRS is a semi-structured clinical interview, assessing a range of suicide-related behaviors (Horwitz et al., 2015; Posner et al., 2011). For the current study, the frequency of interrupted, aborted, and actual attempts were utilized, as well as actual and potential lethality ratings for actual suicide attempts. Reliability and validity have been adequately supported (Posner et al., 2011). In the present study, all raters (n = 9) were supervised bachelors-level research assistants or clinical psychology graduate students trained to administer the C-SSRS. Uncertainties in classification of interrupted, aborted, or actual suicide attempts were decided via consensus among raters.

2.1.2. Suicidal ideation

The Modified Scale for Suicide Ideation (MSSI) is an 18-item clinician rating scale of the severity of suicidal ideation (Miller et al., 1986) and suicidal ideation was assessed for the past year. Each item is rated from 0 to 3 with total scores ranging from 0 to 54. Reliability and validity have been adequately supported (Miller et al., 1986). Internal consistency in this sample was α = .93.

2.1.3. Depressive symptoms

The Beck Depression Inventory – II is a 21-item depressive symptom measure with established reliability and validity (Beck et al., 1996). Each item is rated from 0 to 3 with total scores ranging from 0 to 63. Internal consistency in this sample was α = .92.

2.2. Data analysis

Missing data in the final study sample (n = 142) were evaluated with Little's MCAR test, $\chi^2(21) = 25.45$, $p = .23$. Data were assumed to be missing at random (MAR). An expectation maximization algorithm was used to account for missing data. Two cases were identified as statistical outliers and were removed prior to analysis. Due to the limited variability in the distribution of actual, interrupted, and aborted suicide attempts (i.e., a small percentage of adolescents reported counts > 1), the attempt data were recoded into three ordinal categories representing 0, 1, or > 1 attempts (non-attempters, single attempters, and multiple attempters, respectively). For all analyses, these variables were treated as ordered categories.

3. Results

The number and proportion of the sample reporting 0, 1, or > 1 attempts of each type are presented in Table 1, along with the mean and SD of depressive symptoms and suicide ideation for each frequency group. One-way ANOVAs indicated significant differences in suicide ideation and depressive symptoms between interrupted, aborted, and actual attempt frequency groups. Significant post-hoc Tukey's tests indicated greater depressive symptoms and suicide ideation among single and/or multiple attempters in each attempt type, as compared with non-attempters. For actual attempts, there were significant differences in suicide ideation between all frequency groups. There were no significant age differences between attempt frequency groups for any attempt type.

Chi-squared tests indicated significant associations between actual and aborted attempts ($\chi^2(4) = 29.85$, $p < .001$), actual and interrupted attempts ($\chi^2(4) = 44.76$, $p < .001$), and between aborted and interrupted attempts ($\chi^2(4) = 14.43$, $p = .01$), such that greater frequency of attempts of each type occurred together more frequently than would be expected by chance. There was also a significant association between actual attempts and sex, ($\chi^2(2) = 7.85$, $p = .02$), such that girls engaged in actual attempts more frequently than boys. Aborted and interrupted attempts were not associated with sex. There were no significant associations between the frequency of each attempt type and either the actual or potential lethality of actual attempts.

An ordinal logistic regression model was evaluated, with the frequency of actual attempts (0, 1, > 1) as the dependent variable. Sex,

depressive symptoms, and suicidal ideation were entered as covariates, as each was associated with the frequency of actual attempts. The model had an R^2 of .45, with a non-significant Brant test, indicating the proportional adds assumption was not violated. In the model, suicide ideation (b = .07, p = .01, OR = 1.07, 95% CI 1.02, 1.12), frequency of interrupted attempts (b = 1.33, $p < .001$, OR = 3.78, 95% CI 1.95, 7.31), and frequency of aborted attempts (b = .79, p = .03, OR = 2.21, 95% CI 1.11, 4.43) were significantly associated with the frequency of actual attempts.

4. Discussion

This study provided initial data on the incremental validity of interrupted and aborted attempts for estimating the frequency of actual suicide attempts among adolescent psychiatric inpatients. Both interrupted attempts and aborted attempts were significantly associated with the frequency of actual attempts after covarying for suicidal ideation and demographic characteristics. These preliminary results suggest that a failure to integrate interrupted and aborted attempts into suicide risk assessments may result in underestimates of adolescent suicide risk. These results also highlight the prevalence of interrupted and aborted suicide attempts among an adolescent psychiatric inpatient sample as compared with non-inpatient samples, for which lower prevalence rates have been reported (Kerr et al., 2014).

The findings of this study should be considered in the context of its limitations. First, data were cross-sectional; replication of these findings using longitudinal designs is imperative before firm conclusions and clinical recommendations can be made. Also, it was not possible to determine temporal relations between interrupted, aborted, and actual suicide attempts in the present study, so temporal assumptions should not be made. Future research should consider the incremental validity of interrupted and aborted attempts for predicting future suicide attempts, after controlling for baseline suicidal ideation and suicide attempt history. In addition, the data from this study come from an adolescent psychiatric inpatient unit and may not be generalizable to adolescents seen in other settings.

Study results suggest that interrupted and aborted suicide attempts are associated with the frequency of actual suicide attempts, beyond the effect of suicidal ideation and depressive symptoms. Additional research is needed to evaluate the incremental validity of interrupted and aborted suicide attempts for prospectively predicting actual suicide attempts. Clinicians utilizing the C-SSRS as a risk assessment tool should consider interrupted and aborted suicide attempts as potential risk markers for actual suicide attempts.

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