HHS Public Access

Author manuscript

J Psychiatr Res. Author manuscript; available in PMC 2022 May 01.

Published in final edited form as:

J Psychiatr Res. 2021 May ; 137: 572–578. doi:10.1016/j.jpsychires.2020.10.041.

Characteristics of Depressed Suicide Attempters with Remitted Substance Use Disorders

Mina M. Rizk[1,2,*], **Hanga Galfalvy**[2,3], **Jeffrey M. Miller**[1,2], **Matthew Milak**[1,2], **Ramin Parsey**[4], **Michael Grunebaum**[1,2], **Ainsley Burke**[1,2], **M. Elizabeth Sublette**[1,2], **Maria A. Oquendo**[5], **Barbara Stanley**[1,2], **J. John Mann**[1,2,6]

[1]Department of Psychiatry, Columbia University Irving Medical Center, Columbia University, New York, NY, USA

[2]Division of Molecular Imaging and Neuropathology, New York State Psychiatric Institute, New York, NY, USA

[3]Department of Biostatistics, Mailman School of Public Health, Columbia University, New York, NY, USA

[4]Department of Psychiatry, Stony Brook University, New York, NY, USA

[5]Department of Psychiatry, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA

[6]Department of Radiology, Columbia University Irving Medical Center, New York, NY, USA

Abstract

Substance use disorder (SUD) comorbidity in mood disorders increases suicide risk. Suicide attempters with active SUD appear to have distinct characteristics but little is known whether these characteristics persist during remission and if they are related to different aspects of suicidal behavior. In this study, suicide attempters with a DSM mood disorder and remitted SUD (AT+SUD) (N=135) were compared to those without lifetime SUD (AT−SUD) (N=219) in terms of demographic, clinical and suicidal behavioral characteristics. Factor analyses were conducted to generate subjective distress and impulsivity/aggression factors - previously identified by our group to predict suicide risk in mood disorders. Associations between these traits and SUD history and

[*]**Corresponding Author:** Mina M. Rizk; 1051 Riverside Dr., Unit 42, New York, NY 10032; mina.rizk@nyspi.columbia.edu; Tel: 646-774-7518.

Contributors

M.M.R. performed part of the statistical analysis, and conceptualized and wrote the manuscript. H.G. performed the factor analysis. J.M.M., M.E.S, M.S.M., R.P., M.G., M.A.O, B.S. and J.J.M. designed and wrote the protocols for the studies acquiring the clinical data, and supervised their implementation, and edited the manuscript. A.B. supervised the clinical data gathering. All authors significantly contributed to and have approved the final manuscript.

Conflict of interest

Maria A. Oquendo, Ainsley Burke, Barbara Stanley and J. John Mann receive royalties for commercial use of the Columbia Suicide Severity Rating Scale from the Research Foundation for Mental Hygiene. Dr. Oquendo's family owns stock in Bristol Myers Squibb and she owns equity in Mantra, Inc. Dr. Galfalvy's family owns stock in IBM, Inc and Illumina, Inc. Other authors have no conflict of interest to declare.

suicidal behavior characteristics were then tested. Compared with AT−SUD, AT+SUD were more likely to be male, less educated and to have a Cluster B personality disorder. AT+SUD individuals had greater impulsivity/aggression factor scores, but comparable subjective distress scores. AT +SUD made a greater number of suicide attempts, with higher lethality, despite comparable suicide intent and degree of planning with AT−SUD. Impulsivity/aggression was higher in multiple versus single attempters, but did not correlate with suicide attempt lethality. Among suicide attempters with mood disorders, a history of lifetime SUD was associated with more frequent and more lethal suicide attempts. Among other correlates of lifetime SUD in this sample, impulsive/aggressive traits may explain greater frequency of suicide attempts. The results underscore that persons with mood disorders and lifetime SUD are at particularly high risk of frequent and lethal suicide attempts where more intensive prevention efforts are warranted.

1. Introduction:

Substance use disorders (SUD) increase risk for suicidal ideation (Cottler et al., 2005; Pirkis et al., 2000), suicide attempts (Bernal et al., 2007; Borges et al., 2000), and death by suicide (Cavanagh et al., 2003; Cheek et al., 2016; Wilcox et al., 2004). Evidence of substance misuse is often found in the blood toxicology report at autopsy in individuals who died by suicide (Ho et al., 2014). Although mood disorders are among the most important suicide risk factors (Brown et al., 2000; Cavanagh et al., 2003; Sokero et al., 2005), comorbidity with SUD increases vulnerability significantly (Grunebaum et al., 2006; Hawton et al., 2013; Oquendo et al., 2010; Sher et al., 2005; Sher et al., 2007; Sublette et al., 2009). This raises questions about the mechanisms by which SUD increases the risk of suicide attempts in mood disorders.

Individuals with history of SUD continue to be at high-risk for suicidal ideation and behavior after abstinence from substance use (Aharonovich et al., 2002; Frederick et al., 1973; Mino et al., 1999). Vulnerability to suicidal behavior in SUD may be thus related to certain psychopathological traits that drive SUD in the first place, are augmented by chronic substance use, and may persist during remission. Subjective distress and impulsivity/ aggression are suicide-related diathesis elements (Mann and Rizk, 2020; van Heeringen and Mann, 2014) that are strongly associated with SUD (Garland et al., 2017; Hoaken and Stewart, 2003). Chronic drug use may further increase subjective distress through tolerance development and related neurobiological changes that are sometimes irreversible (Baler and Volkow, 2006; Shurman et al., 2010). With increasing levels of distress, patients faced with stressors internally (e.g., a mood episode) or externally (e.g., financial or relationship problems) may reach a point when suicide seems to be the only option (Mee et al., 2006). High levels of impulsivity and aggression may then increase the chances of acting on suicidal thoughts, particularly given that substances of abuse are potentially lethal and readily available means of suicide (Sarchiapone et al., 2011). Identifying how characteristics of suicidal, mood-disordered individuals with a history of SUD translate into suicidal behavior may increase our understanding of suicide risk and how to reduce it in this co-morbid population.

Suicide attempters can vary greatly with respect to characteristics of their suicidal behavior, such as lethality, intent, frequency and degree of planning. This heterogeneity makes it difficult to draw general conclusions about risk factors for suicide when looking at attempters as a single group (Bernanke et al., 2017). Most previous studies by our group (Grunebaum et al., 2006; Sher et al., 2005; Sublette et al., 2009), and others (Britton et al., 2015; Kazour et al., 2016; Kim et al., 2012), have mainly focused on comorbidity of SUD with mood disorders in general and on the fact that SUD comorbidity is associated with increased suicide risk in individuals with mood disorders. Only few studies have directly examined clinical and demographic profile of suicide attempters with SUD (Hankoff and Einsidler, 1976; McManama O'Brien and Berzin, 2012; Pashkovskiy et al., 2018; Sher et al., 2007) but whether these characteristics persist during remission from SUD and how they are related to different aspects of suicidal behavior remains poorly understood.

In the current study, we compared mood-disordered suicide attempters with and without a remitted SUD in terms of demographic, clinical and suicidal behavioral characteristics. Additionally, we generated subjective distress and impulsivity/aggression factors scores following factor analysis methodology developed by our group (Mann et al., 1999; Oquendo et al., 2004), and examined if these traits are different between the two groups and how these differences translate into various characteristics of suicidal behavior.

2. Material and Methods:

Participants

Participants were recruited through multiple study protocols at two sites: New York State Psychiatric Institute/Columbia University (New York, NY) and the Western Psychiatric Institute and Clinic (Pittsburgh, PA) between January 1990 and May 2017. All study protocols were approved by the respective Institutional Review Board and all participants gave their written informed consent after the nature of the procedures had been fully explained. Subsets of the participants in the current study have been included in previous published studies with different objectives.

Participants were 18 years or older and had capacity to provide informed consent. Participants who met the DSM-III/DSM-IV criteria for a mood disorder and a lifetime history of suicide attempt were assessed for history of SUD, including alcohol or other substance abuse and/or dependence. Participants were classified into two groups; suicide attempters with lifetime history of SUD (AT+SUD) (N = 135) and suicide attempters without lifetime history of SUD (AT−SUD) (N = 219). Common exclusion criteria across studies included: 1) unstable medical condition; 2) current alcohol use disorder or SUD (participants were not meeting criteria for alcohol/substance abuse for ≥ 2 months and dependence for ≥ 6 months); 3) schizophrenia or any other psychotic disorder; 5) marked cognitive impairment that would interfere with participation.

Clinical assessment

A psychiatric history, physical examination, and routine laboratory screening including urine drug testing were performed. Diagnoses were made by psychologists with at least a Master's

degree or psychiatric nurses using the Structured Clinical Interview for DSM-III/DSM-IV (SCID), parts I (American Psychiatric Association, 1994; First et al., 2002) and II (First et al., 1997).

The sample was extensively characterized with regard to demographic and clinical characteristics, including history of SUD. Self- and clinician-rated current severity of depressive symptoms were evaluated with the Beck Depression Inventory (BDI) (Beck et al., 1961) and the Hamilton Depression Rating Scale-17 item (HDRS) (Hamilton, 1960), respectively. Internal consistency of BDI is high (Cronbach's alpha = 0.88) (Beck and Steer, 1984). HDRS has internal reliability ranging from 0.46 to 0.97, an inter-rater reliability of .82 to .98, and a test-retest reliability of .81 to .98 across 70 different studies (reviewed in (Bagby et al., 2004)). Hopelessness was assessed with the Beck Hopelessness Scale (BHS) (Beck, A. T. et al., 1974b), which has high internal consistency (Cronbach's alpha=0.93) (Beck, Aaron T. et al., 1974) and reliability ranging from 0.83 to 0.86 in psychiatric populations (Durham, 1982).

Lifetime impulsivity was assessed using the Barratt Impulsiveness Scale (BIS) (Barratt, E. S. , 1985), a self-report questionnaire consisting of 30 questions. Each item has 4-point Likert scale ranging from 1 (rarely/never) to 4 (almost always/always). The total score ranges from 30 to 120 and higher scores indicate greater impulsivity. Internal consistency for BIS is high for general psychiatric patients (Cronbach's alpha=.83) (Barratt, Ernest S., 1985). Aggression was measured using the Brown-Goodwin Aggression Inventory (B-G) (Brown et al., 1979). The B-G is an 11-item interview that assesses lifetime aggressive behaviors separately across three stages of life (childhood, adolescence, and adulthood) on a scale of 0 (never) to 3 (often), with high inter-rater reliability (ICC=.94). We computed the total score as the sum of the maximum scores in either the adolescent and adult age periods for each item, with the final item of the scale (self-injury) excluded due to its overlap with suicidal behavior (Keilp et al., 2006; Stanley et al., 2019). Lifetime hostility was assessed using the Buss-Durkee Hostility Inventory (B-D) (Buss and Durkee, 1957), which is a 75-item True-False questionnaire with a good test-retest reliability (Biaggio et al., 1981).

Suicide history was assessed with the Columbia Suicide History Form (Oquendo et al., 2003). Past week suicidal ideation was evaluated at baseline with the Beck Scale for Suicidal Ideation (SSI) (Beck et al., 1979). Suicide intent and lethality (medical consequences) were assessed for the most recent suicide attempt and the highest lethality attempt, using the Beck Suicide Intent Scale (SIS) (Beck, A. T. et al., 1974a) and the Beck Lethality Scale (BLS) (Beck et al., 1975), respectively. Additionally, participants' responses to Question 15 on the SIS was used to assess the degree of premeditation. This SIS item is operationalized into three groups: impulsive, less than three hours, and greater than three hours. Participants were classified according to the reported length of time planning their maximum-lethality and most recent suicide attempts: 'unplanned' if impulsive or less than three hours, or 'planned' if more than three hours.

Statistical analysis

In preliminary analyses, all quantitative variables, by diagnostic group, were evaluated for normal distribution and checked for outliers. Demographic and clinical variables and

suicidal behavior characteristics (number of attempts, intent, lethality, degree of planning) were compared between the AT+SUD and AT−SUD groups using independent two sample two-tailed *t*-tests for continuous variables, and chi-square tests of independence or Fisher's Exact test for categorical variables. These analyses were performed in IBM SPSS Statistics (SPSS Inc., Chicago, Illinois, USA, Version 26.0). All hypothesis tests were two-sided with a significance level of α=0.05.

Our group has previously identified two suicide-related diathesis elements with predictive power for suicidal behavior, namely impulsivity/aggression and subjective distress (Mann et al., 1999; Oquendo et al., 2004). In the current study, we conducted two factor analysis models to generate scores that reflect these traits. Multivariate Imputation by Chained Equations using the R function "mice" (Buuren and Groothuis-Oudshoorn, 2011) was first used to impute missing values in the measures used for these analyses as well as age, sex, primary diagnosis indicator and SUD status. The first factor analysis was performed by entering the BIS, B-G and B-D scores into a principal component analysis (PCA) (based on correlation matrix, equivalent to using standardized scores, and without rotation). The second factor analysis was planned to derive factors of subjective distress that are independent of current depression severity. Therefore, the imputed BDI and BHS were first adjusted by HDRS scores, by entering them in individual regression models as the dependent variable and HDRS as the independent variable, and retaining the residuals. The residuals were then entered into a PCA (based on the correlation matrix, without rotation). For each factor analysis, the number of factors retained was determined to explain at least 80% of the variability in the respective measures. After calculating the factors, independent two-tailed *t*-tests were used to examine whether each differed between the AT+SUD and AT−SUD. Additionally, the relationships between factor scores and characteristics of suicidal behavior that differed between the two study groups were examined.

3. Results

Participants' (N = 354) demographic and clinical characteristics are shown in Table 1 and Table 2, respectively. One hundred and thirty-five suicide attempters (38.14%) met DSM diagnostic criteria for lifetime history of SUD and 219 (61.86%) did not.

AT+SUD (N = 135) were more likely to be males and had fewer years of education, compared with AT−SUD (N = 219). The two groups did not differ in terms of age, race, ethnicity, marital status or employment status. Nor did they differ in reported history of childhood abuse or family history of completed or attempted suicide. AT+SUD participants were more likely to be inpatients at time of interview compared to AT−SUD. The two groups were not different regarding comorbid anxiety or eating disorders. AT+SUD were more likely to have cluster B personality disorders compared with AT−SUD, but the two groups were not different in terms of other personality disorders.

As shown in Table 3, compared to AT−SUD, AT+SUD reported more lifetime suicide attempts and greater maximum lethality, but the most recent suicide attempts did not show a group difference in lethality. Scores on SSI and SIS were not different between the two groups of attempters.

Lifetime history of SUD was not related to the degree of premeditation (Table 3). However, the degree of lethality of suicide attempts was higher in those who had planned attempts (more than 3 hours of premeditation) compared with unplanned attempts. This was true for both maximum-lethality (t=−2.980, df=328, p=0.003) and most recent (t=−3.712, df=329, p<0.001) suicide attempts.

There were no sex differences in terms of the degree of lethality of maximum-lethality (t1.087, df=345, p=0.278) or most recent (t=1.810, df=343, p=0.071) suicide attempts.

Of the AT+SUD participants, 108 (80%) had lifetime history of alcohol use disorder, 15 (11.1%) had benzodiazepine use disorder, 51 (27.8%) had cannabis use disorder, 46 (34.1%) had stimulants use disorder including cocaine, 5 (3.7%) had hallucinogen use disorder. Sixty-five participants (48.1%) had lifetime history of two or more substance use disorders.

Regarding the suicide methods used, more than half of the participants in both groups used sedative drugs, around 20% used non-sedative drugs, and 12–16% used cutting. Other methods included shooting, immolation, drowning, jumping and hanging and were used by less than 5% of participants in either group. No significant differences between AT+SUD and AT−SUD in terms of suicide method (all ps >0.05).

In the aggression/impulsivity factor analysis, two factors were retained that together explained 85% of the variability in the impulsivity, aggression and hostility measures. The first factor had approximately equal loadings on all three standardized variables (loadings: 0.57, 0.61, 0.55) and accounted for 64% of the variance, while the second factor comprised aggression and impulsivity scores with almost no contribution from hostility scores (loadings: 0.61, 0.11, −0.78), and explained an additional 21% of variability. The first factor was significantly higher in the AT+SUD group compared with the AT−SUD group (t=−6.76, df=352, p<0.001) whereas the second factor was not significantly different between the two groups (t=−1.54, df=352, p=0.125).

Regarding the subjective distress factor analysis, one principal component explaining 80% of the variability was retained, with equal loadings on the BDI and BHS (loadings: 0.71, 0.71). This factor did not differ between AT+SUD and AT−SUD (t=0.91, df=352, p=0.366).

The aggression-impulsivity-hostility factor scores were significantly higher in multiple than single attempters (t=4.188, df=352, p<0.001), but they did not correlate with the degree of lethality of maximum-lethality suicide attempts (rho=0.071, p=0.184).

4. Discussion

Research shows that suicide attempters with active SUD may represent a subgroup of attempters with distinct clinical and suicidal behavior characteristics (Hankoff and Einsidler, 1976; McManama O'Brien and Berzin, 2012; Pashkovskiy et al., 2018; Sher et al., 2007), and that elevated suicide risk continues even after abstinence from substance use (Frederick et al., 1973; Mino et al., 1999). In the current study, we report that characteristics of suicide attempters with remitted SUD parallel those with active SUD (Hankoff and Einsidler, 1976; McManama O'Brien and Berzin, 2012; Pashkovskiy et al., 2018; Sher et al., 2007).

Specifically, compared with AT−SUD, AT+ SUD were more likely to be male, less educated and have cluster B personality disorders. They had more suicide attempts with greater degree of lethality. Further, AT+SUD showed greater impulsivity/aggression, but comparable subjective distress, compared to AT−SUD. Additionally, we found that higher trait impulsivity/aggression in AT+SUD is associated with greater number, but not lethality, of suicidal behavior.

Suicide risk among individuals with history of SUD is estimated to be six times higher than those without SUD (Kessler et al., 1999). Consistent with some prior studies (Hankoff and Einsidler, 1976; Lejoyeux et al., 2012; Weissman et al., 1979), we found a very high rate of lifetime history of SUD (approximately 40%) in depressed suicide attempters. Although the current study is not meant to be epidemiological, this finding shows that our sample might not be skewed. It should be noted, however, that all participants were in remission from SUD, and the exclusion of suicide attempters with active SUD might have reduced the rate of lifetime suicide attempts.

SUD ranks second after mood disorders in psychiatric disorders found in suicide decedents (Cavanagh et al., 2003; Yoshimasu et al., 2008). A review of psychological autopsy studies showed that about one third of all male and 15% of all female suicide decedents had lifetime history of SUD (Schneider, 2009). These observations are consistent with our finding that compared with AT−SUD, AT+SUD reported higher-lethality suicide attempts, which closely resemble actual suicides (Beck et al., 1975; Stengel, 1964). Others also find strong relationships between SUD and high-lethality suicidal behavior (Dhossche et al., 2000; Fleischmann et al., 2005; Levy and Deykin, 1989; McManama O'Brien and Berzin, 2012; Sublette et al., 2009). Specifically, comorbidity of SUD increases both the rate and lethality of suicide attempts in adults with major depression (Dhossche et al., 2000), bipolar disorder (Sublette et al., 2009), schizophrenia (Dervaux et al., 2003) and borderline personality disorder (Black et al., 2004; Oldham, 2006). Youth with SUD are 5 to 10 times more likely to die by suicide than those without these disorders (Fleischmann et al., 2005). Adolescents with SUD engage in suicidal behavior with more severe medical consequences, compared with adolescents without SUD (Levy and Deykin, 1989; McManama O'Brien and Berzin, 2012). Of note, we found that suicide intent did not differ between suicide attempters with and without SUD history despite difference in degree of lethality. This is consistent with a prior study which found that individuals with SUD have a greater risk of serious suicide acts even when they have less intention of dying (Oldham, 2006).

Additionally, we found that AT+SUD were more likely than AT−SUD to have a history of multiple suicide attempts. This is consistent with findings from STAR*D study showing that major depressive disorder patients with comorbid SUD have a history of more previous suicide attempts compared with those without SUD (Davis et al., 2006). Further, compared with single suicide attempters, and with suicidal ideators who never attempted suicide, multiple suicide attempters are more likely to have a SUD diagnosis (Miranda et al., 2008). The number of previous suicide attempts made by an individual has been found to a robust predictor of subsequent suicidal behavior (Beautrais, 2004; Soloff et al., 2005). Therefore, our data speak to the importance of thorough assessment of suicidal ideation and behavior in SUD.

In the current study, suicide attempters with SUD history were more likely to have comorbid cluster B personality disorder and higher impulsivity-aggression-hostility traits, compared with attempters without SUD. Individuals with borderline personality disorder demonstrate high levels of impulsivity (Linehan, 1993), and aggression and hostility are key features of antisocial personality disorder (Blair, 2001; Verona et al., 2001). Both borderline and antisocial personality disorders are risk factors for suicidal behavior (Brent et al., 1994; Brodsky et al., 1997; Cheng et al., 1997; Lesage et al., 1994). Comorbidity of borderline personality disorder with SUD increases both the number and seriousness of suicide attempts (Black et al., 2004).

Our group previously reported that suicide attempters with mood disorders exhibited pronounced subjective distress and impulsivity/aggressive traits (Galfalvy et al., 2006; Keilp et al., 2006; Mann et al., 1999; Oquendo et al., 2006; Oquendo et al., 2004; Oquendo et al., 2000; Sher et al., 2006; Sher et al., 2005; Zalsman et al., 2006). We also reported a significant association between alcoholism and impulsive-aggressive traits in patients with mood disorders (Sher et al., 2005), and between SUD and impulsive/aggressive traits and number of suicide attempts in bipolar disorder (Grunebaum et al., 2006). The current study expands those previous analyses by examining the association between lifetime SUD and previously identified subjective distress and aggressive-impulsivity factors among suicide attempters with mood disorders. Here, we found that although depressed suicide attempters with and without lifetime SUD had comparable levels of subjective distress, attempters with SUD history had significantly greater impulsivity/aggression traits. Further, impulsivity/aggression factor scores were significantly higher in multiple versus single attempters - although they were not related to lethality of suicidal behavior. Impulsivity/aggression traits are related to the frequency with which an individual attempts suicide (Brodsky et al., 1997; Chesin et al., 2010; Doihara et al., 2008; Gvion, 2018), whereas lethality of suicidal behavior is linked to the degree of planning for suicidal behavior (Chaudhury et al., 2016). Although AT+SUD had higher suicide attempt lethality compared with AT−SUD, the two groups did not differ in degree of planning. This finding - coupled with comparable intentions to die by suicide in both groups - suggest that the lethality of suicidal behavior in individuals with SUD may be attributed, at least partly, to a different factor, such as the availability and potential lethality of substances of abuse.

This study is limited by the retrospective nature of its data. Therefore, the temporal relationships between impulsivity/aggression, personality traits/disorders, depression, substance use and suicidal behavior cannot be established. Additionally, AT+SUD were in remission from substance use at the time of study enrollment and we could not be certain about the relationship between time of suicide attempt and time of active SUD. The role of medical comorbidities associated with SUD (e.g., HIV infection) in increasing suicide risk (Tran et al., 2019a) were not assessed in the current study because we have excluded patients with any significant or unstable medical illness. Future prospective studies could address these issues.

In conclusion, screening for lifetime history of SUD seems to be important in suicide attempters with mood disorders due to the high rate of SUD and related elevated lethality and number of suicide attempts even in cases where SUD is remitted. Approaches to prevent

suicide in individuals with current or past SUD likely require addressing impulsivity/aggressive traits and nonpharmacologic approaches. Cognitive behavioral therapy can help individuals by an antidepressant effect and by helping to identify high-risk situations and the cues capable of triggering an impulsive action (Tran et al., 2019b; Vassileva and Conrod, 2019). Both effects may explain CBT's effectiveness in reducing suicide risk (Hawton et al., 2016). Safety planning interventions helps engagement of suicidal individuals in a suicide-related narrative aimed at identifying warning signs and provides individuals with a prioritized and specific set of coping strategies and sources of support that they can use if suicidal thoughts re-emerge, as an alternative to suicidal behavior (Stanley and Brown, 2012).

Acknowledgements

We thank the study participants and entire staff of the Division of Molecular Imaging and Neuropathology for their time and effort.

Funding Sources:

This work used data from projects supported by several National Institute of Mental Health (NIMH) grants, including MH062185, MH074813, MH076049, MH079033, MH085061, MH093637, MH096784, MH062185, MH091553, MH090964, MH090964 and MH040695. Dr. Rizk is supported by the Paul Janssen Postdoctoral Fellowship in Translational Neuroscience from Columbia University and a NARSAD Young Investigator Award from the Brain and Behavior Research Foundation.

References

Aharonovich E, Liu X, Nunes E, Hasin DS, 2002. Suicide attempts in substance abusers: effects of major depression in relation to substance use disorders. Am J Psychiatry 159(9), 1600–1602. [PubMed: 12202286]

American Psychiatric Association, 1994. DSM-IV: Diagnostic and statistic manual of mental disorders, American Psychiatric Association, Washington DC.

Bagby RM, Ryder AG, Schuller DR, Marshall MB, 2004. The Hamilton Depression Rating Scale: has the gold standard become a lead weight? Am J Psychiatry 161(12), 2163–2177. [PubMed: 15569884]

Baler RD, Volkow ND, 2006. Drug addiction: the neurobiology of disrupted self-control. Trends Mol Med 12(12), 559–566. [PubMed: 17070107]

Barratt ES, 1985. Impulsiveness defined within a system model of personality, in: Spielberger CD, Butcher JN (Eds.), Advances in Personality Assessment. Erlbaum, New York, pp. 113–132.

Barratt ES, 1985. Impulsiveness subtraits: Arousal and information processing. Motivation, emotion, and personality 5, 137–146.

Beautrais AL, 2004. Further suicidal behavior among medically serious suicide attempters. Suicide and life-threatening behavior 34(1), 1–11. [PubMed: 15106883]

Beck AT, Beck R, Kovacs M, 1975. Classification of suicidal behaviors: I. Quantifying intent and medical lethality. Am J Psychiatry 132(3), 285–287. [PubMed: 1115273]

Beck AT, Kovacs M, Weissman A, 1979. Assessment of suicidal intention: the Scale for Suicide Ideation. J Consult Clin Psychol 47(2), 343–352. [PubMed: 469082]

Beck AT, Schuyler D, Herman I, 1974a. Development of suicidal intent scales, in: Beck AT, Resnick HLP, Lettieri DJ (Ed.) The Prediction of Suicide. Charles Press Publishers, Bowie, MD, pp. 45–58.

Beck AT, Steer RA, 1984. Internal consistencies of the original and revised Beck Depression Inventory. J Clin Psychol 40(6), 1365–1367. [PubMed: 6511949]

Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J, 1961. An inventory for measuring depression. Arch Gen Psychiatry 4, 561–571. [PubMed: 13688369]

Beck AT, Weissman A, Lester D, Trexler L, 1974. The measurement of pessimism: the hopelessness scale. Journal of consulting and clinical psychology 42(6), 861. [PubMed: 4436473]

Beck AT, Weissman A, Lester D, Trexler L, 1974b. The measurement of pessimism: the hopelessness scale. J Consult Clin Psychol 42(6), 861–865. [PubMed: 4436473]

Bernal M, Haro JM, Bernert S, Brugha T, de Graaf R, Bruffaerts R, Lepine JP, de Girolamo G, Vilagut G, Gasquet I, Torres JV, Kovess V, Heider D, Neeleman J, Kessler R, Alonso J, Investigators EM, 2007. Risk factors for suicidality in Europe: results from the ESEMED study. J Affect Disord 101(1–3), 27–34. [PubMed: 17074395]

Bernanke JA, Stanley BH, Oquendo MA, 2017. Toward fine-grained phenotyping of suicidal behavior: the role of suicidal subtypes. Mol Psychiatry 22(8), 1080–1081. [PubMed: 28607457]

Biaggio MK, Supplee K, Curtis N, 1981. Reliability and validity of four anger scales. J Pers Assess 45(6), 639–648. [PubMed: 7310621]

Black DW, Blum N, Pfohl B, Hale N, 2004. Suicidal behavior in borderline personality disorder: prevalence, risk factors, prediction, and prevention. J Pers Disord 18(3), 226–239. [PubMed: 15237043]

Blair RJ, 2001. Neurocognitive models of aggression, the antisocial personality disorders, and psychopathy. J Neurol Neurosurg Psychiatry 71(6), 727–731. [PubMed: 11723191]

Borges G, Walters EE, Kessler RC, 2000. Associations of substance use, abuse, and dependence with subsequent suicidal behavior. Am J Epidemiol 151(8), 781–789. [PubMed: 10965975]

Brent DA, Johnson BA, Perper J, Connolly J, Bridge J, Bartle S, Rather C, 1994. Personality disorder, personality traits, impulsive violence, and completed suicide in adolescents. J Am Acad Child Adolesc Psychiatry 33(8), 1080–1086. [PubMed: 7982858]

Britton PC, Stephens B, Wu J, Kane C, Gallegos A, Ashrafioun L, Tu X, Conner KR, 2015. Comorbid depression and alcohol use disorders and prospective risk for suicide attempt in the year following inpatient hospitalization. J Affect Disord 187, 151–155. [PubMed: 26339924]

Brodsky BS, Malone KM, Ellis SP, Dulit RA, Mann JJ, 1997. Characteristics of borderline personality disorder associated with suicidal behavior. Am J Psychiatry 154(12), 1715–1719. [PubMed: 9396951]

Brown GK, Beck AT, Steer RA, Grisham JR, 2000. Risk factors for suicide in psychiatric outpatients: a 20-year prospective study. J Consult Clin Psychol 68(3), 371–377. [PubMed: 10883553]

Brown GL, Goodwin FK, Ballenger JC, Goyer PF, Major LF, 1979. Aggression in humans correlates with cerebrospinal fluid amine metabolites. Psychiatry Res 1(2), 131–139. [PubMed: 95232]

Buss AH, Durkee A, 1957. An inventory for assessing different kinds of hostility. J Consult Psychol 21(4), 343–349. [PubMed: 13463189]

Buuren S, Groothuis-Oudshoorn K, 2011. mice: Multivariate Imputation by Chained Equations inR. Journal of Statistical Software 45(3), 1–68.

Cavanagh JT, Carson AJ, Sharpe M, Lawrie SM, 2003. Psychological autopsy studies of suicide: a systematic review. Psychol Med 33(3), 395–405. [PubMed: 12701661]

Chaudhury SR, Singh T, Burke A, Stanley B, Mann JJ, Grunebaum M, Sublette ME, Oquendo MA, 2016. Clinical correlates of planned and unplanned suicide attempts. J Nerv Ment Dis 204(11), 806–811. [PubMed: 27105457]

Cheek SM, Nestor BA, Liu RT, 2016. Substance Use and Suicidality: Specificity of Substance Use by Injection to Suicide Attempts in a Nationally Representative Sample of Adults with Major Depression. Depress Anxiety 33(6), 541–548. [PubMed: 26393336]

Cheng AT, Mann AH, Chan KA, 1997. Personality disorder and suicide. A case-control study. Br J Psychiatry 170, 441–446. [PubMed: 9307694]

Chesin MS, Jeglic EL, Stanley B, 2010. Pathways to high-lethality suicide attempts in individuals with borderline personality disorder. Arch Suicide Res 14(4), 342–362. [PubMed: 21082450]

Cottler LB, Campbell W, Krishna VAS, Cunningham-Williams RM, Ben Abdallah A, 2005. Predictors of high rates of suicidal ideation among drug users. Journal of Nervous and Mental Disease 193(7), 431–437.

Davis LL, Frazier E, Husain MM, Warden D, Trivedi M, Fava M, Cassano P, McGrath PJ, Balasubramani GK, Wisniewski SR, Rush AJ, 2006. Substance use disorder comorbidity in major

depressive disorder: a confirmatory analysis of the STAR*D cohort. Am J Addict 15(4), 278–285. [PubMed: 16867922]

Dervaux A, Baylé FJ, Laqueille X, Bourdel MC, Olié JP, Krebs MO, 2003. P. 2.029 Suicide attempts in schizophrenia: The role of impulsivity and substance abuse. Eur Neuropsychopharm(13), S291.

Dhossche DM, Meloukheia AM, Chakravorty S, 2000. The association of suicide attempts and comorbid depression and substance abuse in psychiatric consultation patients. Gen Hosp Psychiatry 22(4), 281–288. [PubMed: 10936636]

Doihara C, Kawanishi C, Yamada T, Sato R, Hasegawa H, Furuno T, Nakagawa M, Hirayasu Y, 2008. Trait aggression in suicide attempters: a pilot study. Psychiatry Clin Neurosci 62(3), 352–354. [PubMed: 18588598]

Durham TW, 1982. Norms, reliability, and item analysis of the Hopelessness Scale in general psychiatric, forensic psychiatric, and college populations. J Clin Psychol 38(3), 597–600. [PubMed: 7107924]

First MB, Benjamin LS, Gibbon M, Spitzer RL, Williams JB, 1997. Structured clinical interview for DSM-IV Axis II personality disorders. American Psychiatric Press, Washington DC.

First MB, Spitzer RL, Gibbon M, Williams JB, 2002. Structured Clinical Interview for DSM-IV-TR Axis I Disorders. Research Version, Patient Edition. (SCID-I/P). Biometrics Research, New York State Psychiatric Institute, New York.

Fleischmann A, Bertolote JM, Belfer M, Beautrais A, 2005. Completed suicide and psychiatric diagnoses in young people: a critical examination of the evidence. Am J Orthopsychiatry 75(4), 676–683. [PubMed: 16262523]

Frederick CJ, Resnik HL, Wittlin BJ, 1973. Self-destructive aspects of hard core addiction. Arch Gen Psychiatry 28(4), 579–585. [PubMed: 4692155]

Galfalvy H, Oquendo MA, Carballo JJ, Sher L, Grunebaum MF, Burke A, Mann JJ, 2006. Clinical predictors of suicidal acts after major depression in bipolar disorder: a prospective study. Bipolar Disord 8(5 Pt 2), 586–595. [PubMed: 17042832]

Garland EL, Riquino MR, Priddy SE, Bryan CJ, 2017. Suicidal ideation is associated with individual differences in prescription opioid craving and cue-reactivity among chronic pain patients. J Addict Dis 36(1), 23–29. [PubMed: 27644963]

Grunebaum MF, Galfalvy HC, Nichols CM, Caldeira NA, Sher L, Dervic K, Burke AK, Mann JJ, Oquendo MA, 2006. Aggression and substance abuse in bipolar disorder. Bipolar Disord 8(5 Pt 1), 496–502. [PubMed: 17042888]

Gvion Y, 2018. Aggression, impulsivity, and their predictive value on medical lethality of suicide attempts: A follow-up study on hospitalized patients. J Affect Disord 227, 840–846. [PubMed: 29689698]

Hamilton M, 1960. A rating scale for depression. J Neurol Neurosurg Psychiatry 23, 56–62. [PubMed: 14399272]

Hankoff LD, Einsidler B, 1976. Drug Abuse among Suicide Attempters. International Journal of Offender Therapy and Comparative Criminology 20(1), 26–32.

Hawton K, Casanas ICC, Haw C, Saunders K, 2013. Risk factors for suicide in individuals with depression: a systematic review. J Affect Disord 147(1–3), 17–28. [PubMed: 23411024]

Hawton K, Witt KG, Salisbury TLT, Arensman E, Gunnell D, Hazell P, Townsend E, van Heeringen K, 2016. Psychosocial interventions following self-harm in adults: a systematic review and meta-analysis. Lancet Psychiatry 3(8), 740–750. [PubMed: 27422028]

Ho RCM, Ho ECL, Tai BC, Ng WY, Chia BH, 2014. Elderly Suicide With and Without a History of Suicidal Behavior: Implications for Suicide Prevention and Management. Archives of Suicide Research 18(4), 363–375. [PubMed: 24828390]

Hoaken PN, Stewart SH, 2003. Drugs of abuse and the elicitation of human aggressive behavior. Addict Behav 28(9), 1533–1554. [PubMed: 14656544]

Kazour F, Soufia M, Rohayem J, Richa S, 2016. Suicide Risk of Heroin Dependent Subjects in Lebanon. Community Ment Health J 52(5), 589–596. [PubMed: 26424734]

Keilp JG, Gorlyn M, Oquendo MA, Brodsky B, Ellis SP, Stanley B, John Mann J, 2006. Aggressiveness, not impulsiveness or hostility, distinguishes suicide attempters with major depression. Psychol Med 36(12), 1779–1788. [PubMed: 16959059]

Kessler RC, Borges G, Walters EE, 1999. Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. Arch Gen Psychiatry 56(7), 617–626. [PubMed: 10401507]

Kim HM, Smith EG, Ganoczy D, Walters H, Stano CM, Ilgen MA, Bohnert AS, Valenstein M, 2012. Predictors of suicide in patient charts among patients with depression in the Veterans Health Administration health system: importance of prescription drug and alcohol abuse. J Clin Psychiatry 73(10), e1269–1275. [PubMed: 23140657]

Lejoyeux M, Gastal D, Bergeret A, Casalino E, Lequen V, Guillermet S, 2012. Alcohol use disorders among patients examined in emergency departments after a suicide attempt. Eur Addict Res 18(1), 26–33. [PubMed: 22156705]

Lesage AD, Boyer R, Grunberg F, Vanier C, Morissette R, Menard-Buteau C, Loyer M, 1994. Suicide and mental disorders: a case-control study of young men. Am J Psychiatry 151(7), 1063–1068. [PubMed: 7503818]

Levy JC, Deykin EY, 1989. Suicidality, depression, and substance abuse in adolescence. Am J Psychiatry 146(11), 1462–1467. [PubMed: 2817119]

Linehan MM, 1993. Cognitive-behavioral treatment of borderline personality disorder. Guilford Publications.

Mann JJ, Rizk MM, 2020. A Brain-Centric Model of Suicidal Behavior. American Journal of Psychiatry 177(10), 902–916.

Mann JJ, Waternaux C, Haas GL, Malone KM, 1999. Toward a clinical model of suicidal behavior in psychiatric patients. Am J Psychiatry 156(2), 181–189. [PubMed: 9989552]

McManama O'Brien KH, Berzin SC, 2012. Examining the impact of psychiatric diagnosis and comorbidity on the medical lethality of adolescent suicide attempts. Suicide Life Threat Behav 42(4), 437–444. [PubMed: 22646667]

Mee S, Bunney BG, Reist C, Potkin SG, Bunney WE, 2006. Psychological pain: a review of evidence. J Psychiatr Res 40(8), 680–690. [PubMed: 16725157]

Mino A, Bousquet A, Broers B, 1999. Substance abuse and drug-related death, suicidal ideation, and suicide: a review. Crisis 20(1), 28–35. [PubMed: 10365504]

Miranda R, Scott M, Hicks R, Wilcox HC, Harris Munfakh JL, Shaffer D, 2008. Suicide attempt characteristics, diagnoses, and future attempts: comparing multiple attempters to single attempters and ideators. J Am Acad Child Adolesc Psychiatry 47(1), 32–40. [PubMed: 18174823]

Oldham JM, 2006. Borderline personality disorder and suicidality. Am J Psychiatry 163(1), 20–26. [PubMed: 16390884]

Oquendo MA, Currier D, Liu SM, Hasin DS, Grant BF, Blanco C, 2010. Increased risk for suicidal behavior in comorbid bipolar disorder and alcohol use disorders: results from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). J Clin Psychiatry 71(7), 902–909. [PubMed: 20667292]

Oquendo MA, Currier D, Mann JJ, 2006. Prospective studies of suicidal behavior in major depressive and bipolar disorders: what is the evidence for predictive risk factors? Acta Psychiatr Scand 114(3), 151–158. [PubMed: 16889585]

Oquendo MA, Galfalvy H, Russo S, Ellis SP, Grunebaum MF, Burke A, Mann JJ, 2004. Prospective study of clinical predictors of suicidal acts after a major depressive episode in patients with major depressive disorder or bipolar disorder. Am J Psychiatry 161(8), 1433–1441. [PubMed: 15285970]

Oquendo MA, Halberstam B, Mann JJ, 2003. Risk factors for suicidal behavior: utility and limitations of research instruments, in: First MB (Ed.) Standardized Evaluation in Clinical Practice. American Psychiatric Publishing, Washington DC, pp. 103–130.

Oquendo MA, Waternaux C, Brodsky B, Parsons B, Haas GL, Malone KM, Mann JJ, 2000. Suicidal behavior in bipolar mood disorder: clinical characteristics of attempters and nonattempters. J Affect Disord 59(2), 107–117. [PubMed: 10837879]

Pashkovskiy VE, Antonova DV, Prokopovich GA, Egorov AY, 2018. [Psychosocial characteristics of alcohol dependence patients committed self-poisoning suicide attempt]. Zh Nevrol Psikhiatr Im S S Korsakova 118(1. Vyp. 2), 73–78.

Pirkis J, Burgess P, Dunt D, 2000. Suicidal Ideation and Suicide Attempts Among Australian Adults. Crisis 21(1), 16–25. [PubMed: 10793467]

Sarchiapone M, Mandelli L, Iosue M, Andrisano C, Roy A, 2011. Controlling access to suicide means. Int J Environ Res Public Health 8(12), 4550–4562. [PubMed: 22408588]

Schneider B, 2009. Substance use disorders and risk for completed suicide. Arch Suicide Res 13(4), 303–316. [PubMed: 19813108]

Sher L, Carballo JJ, Grunebaum MF, Burke AK, Zalsman G, Huang YY, Mann JJ, Oquendo MA, 2006. A prospective study of the association of cerebrospinal fluid monoamine metabolite levels with lethality of suicide attempts in patients with bipolar disorder. Bipolar Disord 8(5 Pt 2), 543–550. [PubMed: 17042827]

Sher L, Oquendo MA, Galfalvy HC, Grunebaum MF, Burke AK, Zalsman G, Mann JJ, 2005. The relationship of aggression to suicidal behavior in depressed patients with a history of alcoholism. Addict Behav 30(6), 1144–1153. [PubMed: 15925124]

Sher L, Sperling D, Stanley BH, Carballo JJ, Shoval G, Zalsman G, Burke AK, Mann JJ, Oquendo MA, 2007. Triggers for suicidal behavior in depressed older adolescents and young adults: do alcohol use disorders make a difference? Int J Adolesc Med Health 19(1), 91–98. [PubMed: 17458328]

Shurman J, Koob GF, Gutstein HB, 2010. Opioids, pain, the brain, and hyperkatifeia: a framework for the rational use of opioids for pain. Pain Med 11(7), 1092–1098. [PubMed: 20545871]

Sokero TP, Melartin TK, Rytsala HJ, Leskela US, Lestela-Mielonen PS, Isometsa ET, 2005. Prospective study of risk factors for attempted suicide among patients with DSM-IV major depressive disorder. Br J Psychiatry 186(4), 314–318. [PubMed: 15802688]

Soloff PH, Fabio A, Kelly TM, Malone KM, Mann JJ, 2005. High-lethality status in patients with borderline personality disorder. J Pers Disord 19(4), 386–399. [PubMed: 16178681]

Stanley B, Brown GK, 2012. Safety Planning Intervention: A Brief Intervention to Mitigate Suicide Risk. Cogn Behav Pract 19(2), 256–264.

Stanley B, Michel CA, Galfalvy HC, Keilp JG, Rizk MM, Richardson-Vejlgaard R, Oquendo MA, Mann JJ, 2019. Suicidal subtypes, stress responsivity and impulsive aggression. Psychiatry Res 280, 112486. [PubMed: 31376789]

Stengel E, 1964. Suicide and Attempted Suicide. Penguin Books, Oxford, England.

Sublette ME, Carballo JJ, Moreno C, Galfalvy HC, Brent DA, Birmaher B, Mann JJ, Oquendo MA, 2009. Substance use disorders and suicide attempts in bipolar subtypes. J Psychiatr Res 43(3), 230–238. [PubMed: 18590916]

Tran BX, Fleming M, Nguyen TMT, Vu GT, Vuong QH, Ho MT, Dam NV, Vuong TT, Do HN, Doan LP, Latkin C, Ho CS, Ho RC, 2019a. Changes in Substance Abuse and HIV Risk Behaviors over 12-Month Methadone Maintenance Treatment among Vietnamese Patients in Mountainous Provinces. Int J Environ Res Public Health 16(13), 2422.

Tran BX, Moir M, Latkin CA, Hall BJ, Nguyen CT, Ha GH, Nguyen NB, Ho CSH, Ho RCM, 2019b. Global research mapping of substance use disorder and treatment 1971–2017: implications for priority setting. Subst Abuse Treat Prev Policy 14(1), 21. [PubMed: 31101059]

van Heeringen K, Mann JJ, 2014. The neurobiology of suicide. Lancet Psychiatry 1(1), 63–72. [PubMed: 26360403]

Vassileva J, Conrod PJ, 2019. Impulsivities and addictions: a multidimensional integrative framework informing assessment and interventions for substance use disorders. Philosophical Transactions of the Royal Society B-Biological Sciences 374(1766), 20180137.

Verona E, Patrick CJ, Joiner TE, 2001. Psychopathy, antisocial personality, and suicide risk. J Abnorm Psychol 110(3), 462–470. [PubMed: 11502089]

Weissman AN, Beck AT, Kovacs M, 1979. Drug abuse, hopelessness, and suicidal behavior. Int J Addict 14(4), 451–464. [PubMed: 478694]

Wilcox HC, Conner KR, Caine ED, 2004. Association of alcohol and drug use disorders and completed suicide: an empirical review of cohort studies. Drug Alcohol Depend 76 Suppl, S11–19. [PubMed: 15555812]

Yoshimasu K, Kiyohara C, Miyashita K, Stress Research Group of the Japanese Society for, H., 2008. Suicidal risk factors and completed suicide: meta-analyses based on psychological autopsy studies. Environ Health Prev Med 13(5), 243–256. [PubMed: 19568911]

Zalsman G, Braun M, Arendt M, Grunebaum MF, Sher L, Burke AK, Brent DA, Chaudhury SR, Mann JJ, Oquendo MA, 2006. A comparison of the medical lethality of suicide attempts in bipolar and major depressive disorders. Bipolar Disord 8(5 Pt 2), 558–565. [PubMed: 17042829]

Table 1.

Demographic characteristics of depressed suicide attempters with and without history of lifetime substance use disorder.

Variable	**History of lifetime substance use disorder (N = 135)**			**No History of substance use disorder (N = 219)**			**Analysis**		
	n	***Mean***	***SD***	***n***	***Mean***	***SD***	***t***	***df***	***P***
Age (years)	135	36.1	11.2	219	36.7	12.6	−0.473	352	0.637
	n	**%**		**n**	**%**		χ^2	**df**	**P**
Sex; Female	66	29.7		156	70.3		17.831	1	**<0.001**
Race; White	95	38.6		151	61.4		3.334		0.515
Ethnicity; Hispanic	11	29.7		26	70.3		1.171	1	0.279
Education; < high school graduate	41	52.6		37	47.4		8.931	1	**0.003**
Marital Status; Married	19	31.1		42	68.9		6.045		0.193
Currently Employed	55	39.6		84	60.4		0.199	1	0.655
History of childhood physical/sexual abuse (before age 15)	43	34.7		81	65.3		1.297	1	0.328
History of completed suicide in a family member	8	61.5		5	38.5		3.133	1	0.087
History of attempted suicide in a family member	20	44.4		25	55.6		0.870	1	0.412
Inpatient at time of interview	94	43.5		122	56.5		6.538	1	**0.013**

Table 2.

Clinical characteristics of depressed suicide attempters with and without a history of lifetime substance use disorder.

Variable	History of lifetime substance use disorder (N = 135)			No history of substance use disorder (N = 219)			Analysis		
	n	*%*		*N*	*%*		χ^2	*df*	*p*
Primary Axis I Diagnosis									
Major Depressive Disorder	104	77.0		184	84.0		2.684	1	0.101
Bipolar Disorder	31	23.0		35	16.0				
Comorbid Axis I Diagnoses									
Dysthymia	17	47.2		19	52.8		1.403	1	0.278
Any Anxiety Disorder	41	33.6		81	66.4		1.619	1	0.208
Eating Disorder	8	47.1		9	52.9		0.603	1	0.452
Axis II Diagnoses									
Cluster A Disorders:									
Paranoid	10	43.5		13	56.5		0.223	1	0.661
Schizoid	2	33.3		4	66.7		0.078	1	0.568$^{\$}$
Schizotypal	3	50.0		3	50.0		0.320	1	0.681$^{\$}$
Cluster B Disorders:									
Antisocial	21	84.0		4	16.0		23.729	1	**<0.001**$^{\$}$
Borderline	62	50.8		60	49.2		12.603	1	**<0.001**
Histrionic	6	54.5		5	45.5		1.244	1	0.265
Narcissistic	11	68.8		5	31.3		6.523	1	**0.016**
Cluster C Disorders:									
Avoidant	19	36.5		33	63.5		0.141	1	0.757
Dependent	8	53.3		7	46.7		1.390	1	0.282
Obsessive-Compulsive	14	50.0		14	50.0		1.608	1	0.226
Depression Characteristics									
	n	**Mean**	**SD**	**n**	**Mean**	**SD**	**t**	**df**	**p**
Hamilton Depression Rating Scale-17 item	133	20.1	6.2	213	20.4	5.1	−0.599	344	0.550
Beck Depression Inventory	112	28.5	11.2	191	29.6	10.8	−0.856	301	0.393
Beck Hopelessness Scale	117	12.3	5.6	191	13.3	5.5	−1.477	306	0.141
Barratt Impulsivity Scale	100	56.8	17.6	167	50.4	15.5	3.097	265	**0.002**
Lifetime Aggression	125	21.4	6.0	195	17.0	5.0	7.083	318	**<0.001**
Buss-Durkee Hostility Scale	107	38.7	12.4	172	34.3	11.9	2.96	277	**0.003**

$^{\$}$Fisher's Exact test

Table 3.

Characteristics of suicidal ideation and behavior in depressed suicide attempters with and without history of lifetime substance use disorder.

Variable	History of lifetime substance use disorder (N = 135)			No history of substance use disorder (N = 219)			Analysis		
	n	***Mean***	***SD***	***n***	***Mean***	***SD***	***t***	***df***	***P***
Suicidal Ideation									
Beck Scale for Suicidal Ideation (SSI)	129	16.4	11.3	193	15.7	10.3	0.597	320	0.551
Suicidal Behavior									
Number of lifetime suicide attempts	135	2.7	1.7	219	2.1	1.5	3.397	352	**0.001**
Medical lethality of maximum- lethality attempt	135	3.3	1.9	212	2.7	2.1	2.811	345	**0.005**
Medical lethality of most recent attempt	133	2.6	2.0	212	2.3	2.0	1.183	343	0.238
Suicide intent during maximum- lethality suicide attempt	129	16.7	6.0	194	16.2	5.6	0.755	321	0.451
Suicide Intent during most recent attempt	129	16.1	5.9	201	16.1	5.3	0.002	328	0.998
	n	**%**		**N**	**%**		**χ^2**	**df**	**p**
Maximum-lethality attempt was planned *	57	39.6		87	60.4		0.009	1	0.923
Most recent attempt was planned *	56	37.8		92	62.2		0.272	1	0.653

* Participant spent more than 3 hours planning for his/her suicide attempt (assessed by item 15 on suicide intent scale)