

The Association Between Adolescent Substance Abuse and Suicidality

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Abstract

This systematic review explored the relationship between adolescent substance abuse and suicidality. Peer-reviewed journal articles concerned with this topic were analyzed and screened from Google Scholar and Milligan University's online research database. While the research varied in terms of experimental design, the data indicates that adolescent substance use, suicidal ideation, and suicide attempts are positively correlated. Increases in frequency of use and lethality of substance strengthens the relationship between the variables. Findings also indicate that females and minority groups are most likely to exhibit suicidal behavior and non-suicidal forms of self-injury. The research identifies various risk factors that contribute to adolescent suicidal ideation and substance abuse. The research varied in terms of experimental design, implications for future research, and approach to treatment.

Keywords: adolescent, non-suicidal self-injury, substance abuse, suicidality, suicidal ideation

The Association Between Adolescent Substance Abuse and Suicidality

Adolescence is a challenging transitional phase characterized by changes in self-concept and a desire to feel accepted by peers. Depression and substance abuse are significant psychiatric risk factors contributing to suicidal thoughts and behaviors. Adolescent substance use and suicide rates have increased significantly over the last five decades. Data collected from the Center for Disease Control indicates that suicide is the 2nd leading cause of death among American adolescents (CDC, 2014).

The research mentioned throughout this systematic review supports the directional hypothesis that adolescent substance use is positively correlated with suicidality. A meta-analysis of 151 empirical articles examining the association between adolescent substance abuse and suicidal ideation found that adolescents diagnosed with a substance use disorder were more likely to attempt suicide than individuals with no history of prior drug use (Pompili et al., 2012). Despite previous attempts to investigate the association between adolescent substance use and suicidality, little attention has been given to the significance of treatment interventions and suicide prevention techniques designed specifically for at risk groups (Esposito-Smythers et al., 2011).

The findings from this systematic review provide information concerned with the association between adolescent substance abuse and suicidality. This research investigated various risk factors associated with adolescent suicidal ideation, such as how the lethality of a substance affects suicidal behavior, the impact of cognitive-behavioral therapy, environmental factors, and non-suicidal self-injury. The findings provide information that improve the understanding of the relationship between adolescent substance abuse and suicidality.

Methodology

The literature review process began with a database search for peer-reviewed journal articles concerned with adolescent substance use and suicide. Sources were selected from Google Scholar and Milligan University's online research database. The keywords used to search for peer-reviewed journal articles were: adolescence OR adolescents OR teenager OR teens, AND substance abuse OR substance use OR drug abuse OR drug use OR drug addiction, AND suicidality OR suicide OR suicidal ideation. The initial search yielded 28,004 results. After narrowing my search results to peer-reviewed academic journal articles published between 1990 and 2021 (that were available in full text), my search yielded 11,311 results.

The articles were analyzed and evaluated based on the experimental design, relevancy, generalizability, internal validity, and significance. Studies were removed if the main topic was not primarily associated with adolescent substance abuse and suicide. Only quantitative research designs were selected to ensure that the data provided statistically significant results.

I selected 10 sources, including 2 randomized control trials, 1 quasi-experimental design, 2 meta analyses, 1 longitudinal study, and 4 correlational research studies. Multinomial logistic regression analysis was used in the meta analyses to analyze data. The only sources that included a sample size less than at least 1,000 adolescents were the two experimental designs conducted by Esposito-Symthers (2011) and Jones (1997). One meta-analysis screened and analyzed data from 151 empirical articles published between 1990 and 2011. The studies were measured based on quality and relevance. The mean quality score of the studies was 7.7, indicating strong validity and generalizability (Pompili et al., 2012).

Of the 10 sources, I selected 8 peer reviewed journal articles to include in Table 1 and represent the statistical data and the overall researching findings presented in the results section. Two sources were removed due to irrelevance and a primary focus unrelated to the association between adolescent substance abuse and suicidality. The findings displayed in Table 1 represent statistically significant data, measurable outcomes, experimental design, and the reference associated with each study.

Results

While the findings indicate that adolescent substance use and suicidality are positively correlated, one longitudinal study (cite here too) found that polysubstance use and the lethality of a substance impacts suicidal behavior. Logistic regression analysis was used to investigate data collected from the Youth Behavior Risk Survey (YBRS) between 2001 and 2009. The use of 10 various substances and four measures of suicidality were measured in the study. The odds ratio for suicide attempts in the past year among adolescents reporting heroin use compared to non-users was 12.0 (95 % confidence interval = 10.2–14.1, $p < 0.0001$), (Wong et al., 2013).

One correlational study (Kim et al., 2011) examined data from the 2000 National Household Survey on Drug Abuse to examine the relationship between ecstasy use and suicidal behavior among American adolescents (ages 12–17, $N = 19,301$). The results suggest that lethal substance use, including ecstasy, is associated with increased suicidal ideation and suicide attempts. The difference in suicide attempts between the group who used non-lethal drugs and the ecstasy use group was significant ($p = .0121$) (Kim et al., 2011).

Non-suicidal behavior can be described as acts of intentionally causing non-fatal injuries to oneself. Research suggests that the lifetime co-occurrence of non-suicidal self-injury (NNSI)

and suicidal behavior is positively correlated. One epidemiological study found that females are more affected than males by the co-occurrence of NNSI and suicidal behavior (3.3 to 8.8-fold odds). The lifetime co-occurrence of NNSI with suicidal behavior was reported by 7.7% (95% CI 6.2–9.4) of the adolescents (Voss et al., 2020).

Research conducted by Guvendeger (2017) indicates that polysubstance use and an increase in frequency of substance use is associated with an increase in adolescent suicidal behavior. The findings suggest that an increase in frequency of use leads to a 1.298 increase in suicidal behavior ($p < 0.001$). Suicidal behavior and non-suicidal self-injury were 2.616 times higher for females than males ($p < 0.001$). The findings from this correlational study also suggest that environmental factors and social factors contribute to adolescent substance abuse and suicidal ideation. The results suggest that parental incarceration and a negative family structure leads to increases in suicidal behavior (Guvendeger et al., 2017).

It's important to consider the risk factors and environmental factors that contribute to suicidal ideation and substance use. One study examining data from adolescents who completed the 2011 YBRS found that depression and reckless behavior were the strongest risk factors contributing to adolescent suicidal behavior. There was a small, significant correlation between substance abuse and suicidal ideation ($r^2 = 0.13$; Gart & Kelly, 2015) Another study found that high levels of parental support were associated with a decrease in symptoms of depression and adolescent suicidal ideation (LeCloux et al., 2016).

One experimental study analyzing a sample of 15 African Americans who reported to a psychiatric emergency clinic based on symptoms of suicidal ideation suggests that internalizing and externalizing symptoms of behavior contribute to adolescent substance abuse and suicidal behavior. The researchers also suggest that socioeconomic status is a strong predictor for

delinquency, substance abuse, and suicidal ideation. The data indicates a positive association between substance abuse and suicide attempts among the 15 African American adolescents ($p = .014$) (Jones, 1997).

One randomized control trial was interested in the impact of cognitive behavioral treatment interventions on treating adolescents with a comorbid substance use disorder and suicidal ideation. In the experiment, forty adolescents with suicidal ideation and a co-occurring substance or alcohol use disorder from an inpatient psychiatric hospital were randomly assigned to two different treatment groups, an integrated outpatient cognitive-behavioral intervention for co-occurring AOD and suicidality (I-CBT) or enhanced treatment as usual (E-TAU). The researchers hypothesized that I-CBT, in comparison to E-TAU, would be associated with a reduction in substance use, a decrease in suicidal ideation, and a reduction in general impairment. The adolescents randomly assigned to the I-CBT intervention attempted suicide less ($n = 1$) than the E-TAU group ($n = 6, d = 0.82$) (Esposito-Smythers et al., 2011).

Table 1

The association between suicidality and substance abuse among American Adolescents

| References | Participants & Method | Measurable Outcomes | Outcome |
|----------------------------------|--|--|---|
| Esposito-Smythers et al., (2011) | RCT lasting 6 months with 40 adolescents (68% female, 32% male) with a co-occurring SUD recruited from an inpatient psychiatric hospital and symptoms of suicidal ideation | Suicidal behavior, substance use, impairment, hospitalization, arrests, and depression | The adolescents randomly assigned to the integrated outpatient cognitive-behavioral intervention attempted suicide less ($n = 1$) than the enhanced treatment as usual intervention ($n = 6, d = 0.82$) |
| Gart & Kelly, (2015) | 15,363 high school students who completed the 2011 YBRS Secondary analysis analyzing the results of nine questions from the 2011 YRBS | Suicidal thoughts and behaviors, substance use, and depression | Reckless behavior and depression were the strongest risk factors for suicidal ideation. There was a small, significant correlation between substance abuse and suicidal ideation ($r^2 = 0.13$) |

| | | | |
|----------------------------------|---|--|---|
| Guvendeger Doksat et al., (2017) | Cross-sectional data analysis of 2,667 children and adolescents admitted to a hospital between January 2011 and December 2013 | Lifetime history of physical and sexual abuse, substance use, sociodemographic information, family characteristics, and history of suicidal thoughts and behaviors | The increase in the number of substances used leads to a 1.298 increase in the chance for suicidal behavior ($p < 0.001$). The risk of engaging in self-injury was 2.616 times higher for females ($p < 0.001$) |
| Jones, (1997) | 15 African American adolescents (10 females and 5 males) at a psychiatric emergency clinic based on symptoms of suicidal ideation Quasi-experimental | Substance use, symptoms of depression, socioeconomic status, delinquency, psychopathology, and suicidal thoughts and behaviors | Positive association between substance abuse and suicide attempts ($p = .014$). |
| Kim et al., (2011) | Cross-sectional analysis of 19,301 non-institutionalized adolescents (12-17 years of age) from the 2000 national survey on drug abuse | Substance use, suicidal behaviors, measures of psychopathology, and suicide attempts | Positive correlation between ecstasy use and suicide attempts within the past year. The ecstasy group had the strongest association with suicide attempts ($p = .0121$). |
| Pompili et al., (2012) | Systematic review of 151 empirical articles (1980-2011) on the association between adolescent substance abuse and suicidal ideation. The studies were measured based on quality and relevance. The mean quality score of the studies was 7.7. | Substance use, suicidal ideation attempted suicide attempts, stress, legal problems, and psychiatric risk factors. | Substance abuse increases the risk for adolescent suicidal behavior. |
| Voss et al., (2020) | 1,180 adolescents and young adults ranging from 14-21 years of age Stratified RCT | Non-suicidal self-injury (NNSI), suicidal thoughts and behaviors, sociodemographic characteristics, and mental healthcare utilization | The lifetime co-occurrence of NNSI with suicidal behavior was reported by 7.7% (95% CI 6.2–9.4) of the adolescents. The results also indicate that females are more affected than males by NNSI and suicidal behavior during adolescence (3.3 to 8.8-fold odds) |
| Wong et al., (2013) | 73,183 American high school students Longitudinal study analyzing data from the YRBS between 2001 and 2009 | Lifetime use of substances, suicidality, demographic variables, symptoms of depression, and interpersonal violence | The odds ratio for suicide attempts in the past year among adolescents reporting heroin use compared to non-users was 12.0 (95 % confidence interval = 10.2–14.1), with an odds ratio of 3.0 (95 % CI 2.5–3.7, all $p < 0.0001$). |

Notes. CBT = cognitive behavior therapy; RCT = randomized clinical trial; SUD = substance use disorder; YBRS = youth behavior risk survey

Discussion

While the results confirm the directional hypothesis stating that adolescent substance use is positively correlated with suicidality, there were no further expectations prior to the interpretation of data. The most interesting aspect of the research was the data indicating that non-suicidal behavior and suicidality were more prevalent in adolescent females than males (Voss et al., 2020). The methodological approach of primarily selecting correlational research designs and meta-analyses with a large sample size ensures that the studies represent strong generalizability and external validity. The correlational research designs also allow researchers to examine the relationship between variables and ensure that the data represents interval validity.

The research failed to assess for important confounding variables, such as trauma and early childhood experiences, that could impact the relationship between adolescent substance abuse and suicidality. The research also failed to recognize biological factors that could contribute to suicidal behavior and substance abuse. It's important to consider that there could potentially be an unrecognized third variable that better explains the relationship between adolescent substance abuse and suicidality.

The experimental design of the study conducted by Jones (1997) could be interpreted as misleading due to the small sample size and the selection bias of only assessing African Americans in one psychiatric clinic. The results of the study were based on several measures, including a semi-structured interview with a mental health professional who assessed for symptoms of suicidality, psychiatric history, family history, and substance use. The study represents threats to internal validity due to participant bias and the subjectivity of the semi-structured interview.

Further research should examine why adolescent females are more likely to exhibit suicidal behavior than males. Future research should also focus on suicide prevention techniques and interventions designed specifically for at-risk groups. The findings suggest the need for American society to raise awareness of the need for suicide prevention techniques and interventions designed for adolescents with a substance use disorder and symptoms of suicidal ideation. Treatment interventions should consider risk factors and environmental factors associated with the adolescent population in the approach to treatment.

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- Kim, J., Fan, B., Liu, X., Kerner, N., & Wu, P. (2011). Ecstasy use and suicidal behavior among adolescents: Findings from a national survey. *Suicide and Life-Threatening*

Behavior, 41(4), 435–444. <http://dx.doi.org.milligan.idm.oclc.org/10.1111/j.1943-278X.2011.00043.x>

LeCloux, M., Maramaldi, P., Thomas, K., & Wharff, E. (2016). Family support and mental health service use among suicidal adolescents. *Journal of Child & Family Studies*, 25(8), 2597–2606. <https://doi-org.milligan.idm.oclc.org/10.1007/s10826-016-0417-6>

Pompili, M., Serafini, G., Innamorati, M., Biondi, M., Siracusano, A., Di Giannantonio, M., Giupponi, G., Amore, M., Lester, D., Girardi, P., & Möller-Leimkühler, A. (2012). Substance abuse and suicide risk among adolescents. *European Archives of Psychiatry & Clinical Neuroscience*, 262(6), 469–485. <https://doi-org.milligan.idm.oclc.org/10.1007/s00406-012-0292-0>

Voss, C., Hoyer, J., Venz, J., Pieper, L., & Beesdo, B. K. (2020). Non-suicidal self-injury and its co-occurrence with suicidal behavior: An epidemiological-study among adolescents and young adults. *Acta Psychiatrica Scandinavica*, 142(6), 496–508. <https://doi-org.milligan.idm.oclc.org/10.1111/acps.13237>

Wong, S., Zhou, B., Goebert, D., & Hishinuma, E. (2013). The risk of adolescent suicide across patterns of drug use: A nationally representative study of high school students in the United States from 1999 to 2009. *Social Psychiatry & Psychiatric Epidemiology*, 48(10), 1611–1620. <https://doi-org.milligan.idm.oclc.org/10.1007/s00127-013-0721-z>

Annotated Bibliography

Esposito-Smythers, C., Spirito, A., Kahler, C. W., Hunt, J., & Monti, P. (2011). Treatment of co-occurring substance abuse and suicidality among adolescents: A randomized trial. *Journal of Consulting and Clinical Psychology, 79*(6), 728–739.

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This experimental study tested the effectiveness of cognitive-behavioral treatment modalities among a sample of 40 adolescents with a co-occurring substance use disorder and suicidality in a randomized clinical trial. The results indicate that the adolescents randomly assigned to the integrated outpatient cognitive-behavioral intervention reported less substance use and suicidal ideation in comparison to the enhanced treatment as usual intervention. This specific research study is significant because it demonstrates the importance of cognitive-behavioral therapy treatment interventions for adolescents with a history of suicidal ideation and substance abuse.

Gart, R., & Kelly, S. (2015). How illegal drug use, alcohol use, tobacco use, and depressive symptoms affect adolescent suicidal ideation: A secondary analysis of the 2011 youth risk behavior survey. *Issues in Mental Health Nursing, 36*(8), 614–620. [https://doi-](https://doi.org.milligan.idm.oclc.org/10.3109/01612840.2015.1015697)

[org.milligan.idm.oclc.org/10.3109/01612840.2015.1015697](https://doi.org.milligan.idm.oclc.org/10.3109/01612840.2015.1015697)

This study analyzed a sample of 15,363 high school students who completed the 2011 Youth Risk Behavior Survey. Gart and Kelly explored the relationship between adolescent substance use and suicidal thoughts and behavior. Although the results indicate a strong positive correlation between depression and suicidal behavior, there was only a weak correlation between substance use and suicidal behavior.

Guvendeger Doksat, N., Zahmacioglu, O., Ciftci Demirci, A., Kocaman, G. M., & Erdogan, A. (2017). Association of suicide attempts and non-suicidal self-injury behaviors with substance use and family characteristics among children and adolescents seeking treatment for substance use disorder. *Substance Use & Misuse*, 52(5), 604–613. <https://doi-org.milligan.idm.oclc.org/10.1080/10826084.2016.1245745>

This study examined the relationship between adolescent non-suicidal self-injury and suicide attempts. The study also compared family characteristics among adolescents seeking treatment for substance use disorder. Non-suicidal self-injury and suicidal ideation were based on the measurements of a clinical intake interview. Substance use was measured based on the WHO Student Drug Use Questionnaire. The results indicate a positive association between adolescent non-suicidal self-injury, physical abuse, sexual abuse, suicide attempts, and substance use. The results suggest that the presence of a substance use disorder during adolescence can increase the risk of suicidal thoughts and behaviors. The results also suggest that parental incarceration can increase the risk of substance use and suicidal ideation.

Jones, G. D. (1997). The role of drugs and alcohol in urban minority adolescent suicide attempts. *Death Studies*, 21(2), 189–202. <https://doi-org.milligan.idm.oclc.org/10.1080/074811897202074>

This experimental study examined the significance of substance abuse on a sample of 15 adolescent African Americans who reported to a psychiatric emergency clinic based on symptoms of suicidal ideation. Suicidal ideation and substance use were based on various inventories and reports. The results indicate a positive correlation between adolescent African American suicidal ideation and substance use. Although the

study is somewhat outdated, I feel as if the research is relevant because of Jones's focus on a specific population. The generalizability of the results could potentially be misleading due to selection bias and the small sample size.

Kim, J., Fan, B., Liu, X., Kerner, N., & Wu, P. (2011). Ecstasy use and suicidal behavior among adolescents: Findings from a national survey. *Suicide and Life-Threatening Behavior*, 41(4), 435–444. <http://dx.doi.org.milligan.idm.oclc.org/10.1111/j.1943-278X.2011.00043.x>

This study analyzed data from the 2000 National Household Survey on Drug Abuse to examine the relationship between ecstasy use and suicidal behavior among a sample of 19,301 adolescents. It's important to consider that the sample consisted of non-institutionalized adolescents. The results indicate a significant positive correlation between ecstasy use and suicide attempts within the past year. The results suggest that the use of MDMA is associated with an increased risk of suicidal thoughts and behaviors. The researchers indicate the need for suicide prevention techniques and interventions designed for American adolescents with a history of ecstasy use.

LeCloux, M., Maramaldi, P., Thomas, K., & Wharff, E. (2016). Family support and mental health service use among suicidal adolescents. *Journal of Child & Family Studies*, 25(8), 2597–2606. <https://doi-org.milligan.idm.oclc.org/10.1007/s10826-016-0417-6>

This study analyzed data from the National Longitudinal Study of Adolescent to Adult Health to examine the relationship between adolescent suicidal ideation and parental support. Specifically, the study compared variables (perceived levels of parental support, severity of symptoms, and mental-health service use) from a sample of 1,804

suicidal adolescents. The results indicate a strong relationship between high levels of parental support and a decreased likelihood to seek mental health services, a decrease in symptoms of depression, and a decreased likelihood of a suicide attempt.

Pompili, M., Serafini, G., Innamorati, M., Biondi, M., Siracusano, A., Di Giannantonio, M., Giupponi, G., Amore, M., Lester, D., Girardi, P., & Möller-Leimkühler, A. (2012). Substance abuse and suicide risk among adolescents. *European Archives of Psychiatry & Clinical Neuroscience*, 262(6), 469–485. <https://doi-org.milligan.idm.oclc.org/10.1007/s00406-012-0292-0>

This meta-analysis analyzed the results of previous research associated with adolescent substance abuse and suicidal ideation. While the various sources support a strong association between adolescent substance use disorder and suicidal ideation, the research varied in term of reasoning for the association between the two variables. Overall, it was concluded that substance abuse increases the risk for adolescents to experience negative psychological, behavioral, and social symptoms. The results of the negative symptoms increase the risk for suicidal thoughts and behaviors. The meta-analysis also discussed methods for improving the effectiveness of suicide prevention techniques.

Voss, C., Hoyer, J., Venz, J., Pieper, L., & Beesdo, B. K. (2020). Non-suicidal self-injury and its co-occurrence with suicidal behavior: An epidemiological-study among adolescents and young adults. *Acta Psychiatrica Scandinavica*, 142(6), 496–508. <https://doi-org.milligan.idm.oclc.org/10.1111/acps.13237>

This epidemiological study examined the relationship between non-suicidal self-injury and suicidal behaviors in American adolescents. It's important to consider the fact that this study considers adolescents to be between the ages of 14 and 21, which is a limitation. The results indicate a strong likelihood for lifetime non-suicidal behaviors, especially for females. The results also indicate that females are more affected than males by non-suicidal behavior and suicidal behavior during adolescence. This particular study presents valuable information that other sources fail to provide, such as age at onset and number of episodes.

Wong, S., Zhou, B., Goebert, D., & Hishinuma, E. (2013). The risk of adolescent suicide across patterns of drug use: A nationally representative study of high school students in the United States from 1999 to 2009. *Social Psychiatry & Psychiatric Epidemiology*, 48(10), 1611–1620. <https://doi-org.milligan.idm.oclc.org/10.1007/s00127-013-0721-z>

This longitudinal study investigated the association between substance abuse and suicidal behavior based on a nationally representative sample of 73,183 American high school students who completed the Youth Risk Behavior Survey between 2001-2009. Logistic regression analysis was used to examine the association between the lifetime use of 10 various substances and the four measures of suicidality over the last year. The results indicate the strongest association between heroin use and suicidal ideation, suicide plan, suicide attempt, and severe suicide attempts requiring medical attention. The data indicates that suicidal ideation is associated with substances that are considered lethal (methamphetamine, steroids, cocaine, inhalants, ecstasy, and hallucinogens).