

## Mini Review

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# Youth Substance Use and Suicide Behavior

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## Abstract

Suicidal behavior in adolescents has increased by 56% over the last 10 years [1]. Suicide was the second leading cause of death for adolescents in 2016 [2]. The number of hospitalizations for teen suicide attempts nearly doubled from 2008 to 2015 [3]. Understanding the underlying causes of adolescent suicide is necessary for suicide prevention [4]. Because of the complex setting in which suicide behaviors occur, the literature has not definitively identified factors that cause suicide behavior but it has identified a complex combination of precipitating or contributing factors including mental illness, lack of connectedness, stress, and substance use [5]. The current review focuses on four substances identified by SAMHSA's as core measures [6]: alcohol, tobacco, marijuana and prescription drugs. These are the substances most commonly reported to be used by youth. We reviewed their relationship with youth suicidal ideation (SI), suicidal planning (SP) and attempts (SA).

## Alcohol

Both acute and chronic alcohol use is a risk factor for suicide [7]. Borowsky IW, et al. [8] (2001) found a significant association between alcohol use and suicide attempts in adolescents, using data from the National Longitudinal Study of Adolescent Health [8]. Rates of alcohol use among adolescents who attempted suicide, are reported to be between 35% [9] and 42% [10] Swedo SE, et al. Found that high alcohol use, OR 23.6 (95% CI 3.64–153), is a risk factor for engaging in deliberate self-harm, which increases one's risk of suicide by 30-40 times [11]. Sellers (2019) found that alcohol use in the three months prior to psychiatric hospitalization increases the odds of a suicide attempt in suicidal adolescents on the same day and over time. A study by Zhang and Wu [12] demonstrated that students who used alcohol within the past year are at an increased risk of endorsing suicide ideation within the same year.

## Tobacco

Wong SS, et al. [13] found that current users of tobacco had a two to five times higher risk for suicidal behavior than non-users (OR = 1.9-5.2). Early smoking onset was associated with suicide attempts (SA) in both France (OR(adj) = 1.92; 95% CI 1.55-2.37) and the USA (OR(adj) = 1.53; 95% CI 1.02-2.28) [14]. Having ever tried smoking cigarettes was significantly associated with suicide ideation (SI) suicide planning (SP) and attempts (SA) [15,16]. In another study smoking status differentiated between suicidal ideation and suicide

attempt [17]. Even when adjusted for demographic differences, smoking status was significantly associated with both SI and SA [18]. Finally, cigarette use independently increased the risk of suicide behavior with AOR of 2.0-2.3 ( $p < 0.05$ ) among Pacific Islander, American Indian, and multiracial youth [19].

## e-Cigarettes

Tobacco use among youth is dangerous in any form; however, the use of electronic cigarettes and other vapor products has become increasingly popular among this age group over the last five to six years [20]. Research has demonstrated a significant relationship between depressive symptoms and use of electronic cigarettes, which may result in an increase in suicidal behavior among youth [21,22]. Preliminary evidence suggests that electronic cigarette use was associated with increased odds of reporting SI (AOR: 1.23,  $p < .05$ ) and depressive symptoms (AOR: 1.37,  $p < .05$ ) [23]. Lee & Lee [24] found similar results in Korean adolescents, suggesting that electronic cigarette use was associated with significantly higher prevalence of depressive symptoms and suicidality ( $p < .05$ ). New evidence exists of using nicotine liquid from electronic cigarettes as a method of committing suicide by nicotine intoxication [25].

## Marijuana

Marijuana use is becoming more prevalent among youth with the legalization of marijuana and the changing attitudes that followed.

The preponderance of evidence suggests a strong relationship between marijuana use and suicide behavior: Early adolescents using marijuana had 50% greater likelihood of reporting a 1-standard deviation higher depression scores than non-users [prevalence ratio (PR) = 1.50; 95% confidence interval (CI) = 1.07, 2.10] [26]. Wong SS, et al. [13] found that marijuana users reported higher rates of suicidal ideation (OR = 1.9-5.2,  $p < 0.01$ ). In France, early marijuana use initiation in adolescence was associated with higher rate of SA (OR (adj.) = 2.90; 95% CI 2.20-3.83) [14]. King RA, et al. [18] found a significant association between SI, SA and marijuana use. In another study, use of marijuana significantly predicted suicide risk in female adolescents (OR=2.432, 95% CI = 2.055, 2.878,  $P < .0001$ ) [27]. Pena JB, et al. [28] found that using marijuana accounted for a significant difference between suicide attempters and non-attempters in White, Black, and Hispanic high school students in the US. Wong SS, et al. [13] found marijuana to be associated with increased risk for suicidal thoughts (OR = 2.2, 95% CI = 2.1-2.4). Finally, adolescent daily users of marijuana reported significantly increased SI.

## Prescription Drugs

In adolescents aged 14 and older, prescription drugs are the most commonly misused substances after marijuana and alcohol [29]. Almost one in every 4 teens in the United States reports having abused or misused a prescription drug [30]. A recent toxicology study of completed youth suicides found that 73.3% of male and 26.7% of female adolescents had prescribed, and non-prescribed prescription drugs in their system [31]. A 2015 study of Chinese adolescents demonstrated that male adolescents who had used opioids or sedatives for non-medical purposes in the last month had 8.9 to 10.7 times greater odds of reporting a suicidal attempt [32]. Students who misused prescription opioids were found to be 1.5 times more likely to have experienced SI, 1.44 times more likely to have made a plan, and 1.58 times more likely to have attempted suicide during the past 12 months as compared to non-users [33].

Overall, substance use is consistently found to be associated with all three types of suicide behavior: ideation, planning and attempts. As in any complex behaviors, it is often the case that adolescents report multi-drug use, or as in the case of Carretta's team study were found to have ingested multiple substances. Therefore, treatment and prevention of suicidal behavior in adolescence should pay particular attention to substance use [34-38].

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## Conflict of Interest

Author declare no conflict of interest.

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