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## Research Article

# The Alarming Rise in Alcohol and Substance Use amongst Children and Adolescents

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## Abstract

Alcohol and illicit substance use are on the rise amongst children and adolescents all over the world. This can lead to several biological, psychological, social, and legal implications. It also predisposes them to many psychiatric illnesses on the mood and psychotic spectrums, and can lead to maladaptive personality structures, traits, and disorders. Much more statistics and association studies are required in this field to guide preventative, screening, and treatment approaches.

## Introduction

Prevalence studies worldwide are showing that substance use disorders (SUDs) are on the rise among children and adolescents, reaching around 30% [1]. A study found that the percentage of adolescents with SUDs were 43% for alcohol, 22% for nicotine, and 35% for marijuana by late adolescence, with the peak of onset for use being 14 to 16 years of age [2]. Two or more comorbid SUDs were high during adolescence, reaching around 30% [2]. In 2014, NSDUH reported that there were almost 140 million current alcohol users aged 12 or older, with almost 25% classified as binge drinkers and around 5% as heavy drinkers. About 17 million of these met the criteria for an alcohol use disorder in the past year [3]. In 2014, More than 1.5 million people between the ages of 12 and 20 reported driving under the influence of alcohol in the past year [4].

Early prevention strategies prior to the onset of alcohol use and its harmful effects on youth are essential, and although

a good number of such programs exist, many of them are yet to show promising replicable results. A Polish study reported that despite preventative measures, the use of alcohol was 36%, cigarette smoking was around 37%, and general illicit substance use was almost 11% among adolescents [5]. Another study looking at comorbid SUDs among Canadian bipolar disorder affected adolescents found that the lifetime prevalence of SUD was 33%, primarily suffering from alcohol and cannabis use disorders [6].

## Methodology

To better understand the scope and implications of this issue, a structured review of the existing literature was conducted. This study is conducted as a narrative review aimed at summarizing current evidence on alcohol and substance use among children and adolescents. A structured literature search was performed using electronic databases including PubMed, Scopus, and Google Scholar. Keywords



such as “adolescent substance use,” “alcohol use in youth,” “cannabis,” “e-cigarettes,” and “psychoactive substances” were used in various combinations. Articles published in English were considered, with emphasis on epidemiological studies, clinical research, and review articles [2,5,6]. Priority was given to studies published within the last decade, along with landmark earlier studies where relevant [7-10]. Studies were selected based on relevance to prevalence, risk factors, neurobiological effects, and psychosocial implications of substance use in youth [14-16]. Due to the narrative nature of this review, a formal systematic screening or meta-analysis was not performed; however, efforts were made to include representative and high-quality literature to ensure balanced coverage of the topic.

## Discussion

### The Increasing prevalence of alcohol and substance use amongst children and adolescents

Around 60% of adolescents have been drinking once in their lifetime. A study revealed that among adolescents, almost 55% had drunk alcohol, and approximately 7% of them were heavy drinkers [7]. The majority of around 40% had drunk alcohol between 11 and 14 years of age [8]. In France, studies have shown that 60-70% of 11-year-olds reported having tasted alcohol drinks, and that 5-8% might be regarded as “regular” alcohol users [8]. A cross-sectional study on around 61,000 students in high school in Brazil revealed that approximately 70% had experimented with drinking, with around 27% regularly consuming alcohol [9]. An Indian study reported the overall prevalence of lifetime alcohol use among adolescents as 15% with increasing prevalence with age, and the mean age of onset as 13 years [10].

A study looking at the association between tramadol misuse and other illicit substances use in a population of 2000 adolescents in Iran demonstrated that the prevalence of lifetime tramadol misuse was around 5%, with the majority being males [11]. Substance use during the past month was around 2% for alcohol, 5% for cannabis, 9% for ecstasy, 2% for opium, and 0.5% for methamphetamine [11]. Another cross-sectional survey from Nigeria of randomly selected school adolescents found that the prevalence of use of any substance was around 20% [12].

A retrospective study reviewing the demographics and clinical data of almost 2000 substance-using children and young adults aged between 11 and 20 that visited a substance addiction treatment clinic for children and youth in Istanbul, between January 2011 and December 2012, revealed that Cannabis was used amongst around 60%, followed by solvents/inhalants which were almost 40%, and then ecstasy, around 33% [13]. The mean age of onset of substance use was 13 years, and the proportion of polysubstance use was 60% [13]. The early onset of substance and polysubstance use indicates easy accessibility of legal and illicit substances by children and youth in Istanbul.

While these studies collectively indicate a high and increasing prevalence of substance use among adolescents

globally, important regional variations can be observed. For instance, higher alcohol experimentation rates are reported in European and South American populations, whereas lower but steadily increasing trends are seen in parts of Asia and Africa [5,9,10,12].

These differences may reflect variations in cultural norms, regulatory frameworks, socioeconomic conditions, and accessibility of substances. Additionally, the early age of initiation reported across multiple regions suggests a global shift toward earlier exposure, often between 11 and 14 years of age [8, 10]. Importantly, several studies highlight polysubstance use as a growing concern among adolescents, suggesting that prevention strategies should not focus on single substances alone but rather adopt a broader, integrated approach [2,11, 13].

### The effects and of Alcohol and substance use in children and adolescents

Since the human brain doesn't fully develop until early to mid-twenties of age, any substance use during this time before full brain maturation can be detrimental to this process. It is associated with greater lifetime prevalence of conduct disorder, oppositional defiant disorder, panic disorder, impulsivity, anger, depression, assault of others, and an increase in stressful life events [6,7]. Studies have shown that developing adolescent brains may be particularly susceptible to long-term negative consequences of alcohol use [14]. Early alcohol exposure can lead to alterations in dopamine in the nucleus accumbens during adolescence and induce long-term changes in responsivity to ethanol in adulthood [15]. Young adults with alcohol use disorders exhibit hippocampal alterations and episodic memory deficits as well [16].

Although tentatively, it is also hypothesized that there was a substantial evidence supporting a causal relationship between tobacco smoking and an increased risk of schizophrenia spectrum disorders, with nicotine being most likely responsible for this association [17]. This raises concerns about the increasing use of e-cigarettes and nicotine replacement products, particularly by adolescents [17].

Cannabis is currently one of the most popular drugs of abuse in the world. It is being consumed as a medicinal plant, and many parts of the world have legalized it. This may have several negative implications on adolescent cannabis use, leading to an increase in rates of its consumption in various forms and potencies, due to higher availability, easier accessibility, and greater social acceptance ([18]. Long-term harms of cannabis use include the development of dependence, altered brain development, cognitive impairment, chronic bronchitis, and poor educational attainment [19]. A temporal relationship between the use of marijuana and the occurrence of stroke in young people has been described [20]. Cannabis is also considered a “Gateway Drug” that facilitates the use of other substances of abuse [21]. Cannabis use in adolescents can lead to automobile accidents as well.

Cannabis is the most commonly used illicit drug among patients with schizophrenia, with a lifetime prevalence



of almost 65% [22]. It has been found to induce positive and negative psychotic symptoms [23]. Cannabis use may exacerbate pre-existing psychosis [24], exacerbate symptoms of schizophrenia, and increase the risk of predisposed individuals developing schizophrenia [25,26]. Adolescent exposure to tetrahydrocannabinol (THC) in a rat model disrupted the normal developmental process by inducing premature pruning of dendritic spines [27]. Recent preclinical evidence demonstrates THC selectively targets schizophrenia-related molecular and neuropharmacological signaling pathways in the prefrontal cortex and mesolimbic dopamine pathway in adolescents. This can lead to prefrontal cortical GABAergic hypofunction leading to schizophrenia-like symptoms [28].

### Clinical and public health implications

Given these widespread neurobiological and psychiatric consequences, it is essential to consider the broader clinical and public health implications of adolescent substance use.

The rising prevalence of substance use among adolescents has significant clinical and public health implications. Early initiation is associated with a higher risk of developing substance use disorders, psychiatric comorbidities, and long-term cognitive impairment [6,14–16]. From a clinical perspective, early screening in schools and primary care settings is essential. Brief interventions, family-based therapies, and school-based mental health programs have shown promise in reducing substance use behaviors. At the public health level, stricter regulation of alcohol, tobacco, and emerging substances such as cannabis is critical. Evidence suggests that increased accessibility and social acceptance—particularly in the context of legalization—may contribute to higher rates of adolescent use [18,19]. Furthermore, cannabis use has been associated with significant neuropsychiatric consequences, including increased risk of psychosis and schizophrenia spectrum disorders, particularly among vulnerable individuals [22–26]. Prevention strategies should include educational campaigns, parental awareness programs, and community-based interventions aimed at reducing risk factors such as peer pressure, early exposure, and normalization of substance use [12,17].

### Conclusion

The increasing prevalence of alcohol and illicit substance use amongst children and adolescents all over the world is alarming and potentially leading to several biological, psychological, social, and legal implications. It can predispose them to many psychiatric illnesses on the mood or psychotic spectrums, and possibly lead to maladaptive personality structures, traits, and disorders. This area needs further exploration and attention to guide preventative, screening, and treatment approaches.

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