



Association of Severity of Adolescent Substance Use Disorders and Long-term Outcomes

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The current drug crisis, which has continued to escalate during the COVID-19 pandemic and now surpasses 100 000 overdose deaths annually,¹ demands solutions that cut across health care and other sectors of society. Besides the urgent need for greater implementation of effective treatments, there is a need for more widespread evidence-based prevention interventions. Especially needed are interventions that could delay youth from experimenting with drugs and help prevent the transition from occasional drug use to addiction in adolescents and young adults.

Routine screening by clinicians could identify those who would benefit from early interventions. However, despite recommendations from pediatric associations for screening and brief intervention in adolescent patient populations, evidence for the value of such screening has been deemed insufficient by the US Preventive Services Task Force.² The multicohort longitudinal study by McCabe et al³ adds support for the potential value of such an approach.

McCabe et al³ used data from 11 cohorts of high school seniors surveyed in the annual nationwide National Institute on Drug Abuse–funded Monitoring the Future study from age 18 years (study years 1976-1986) to age 50 years. They found that most of the individuals who had severe substance use disorder (SUD) when surveyed in high school still had 2 or more SUD symptoms in midlife. Those with the highest-severity SUD in adolescence had the highest likelihood of prescription drug misuse decades later. Also, the majority of adults currently using prescribed opioids, sedatives, or tranquilizers had multiple SUD symptoms when originally surveyed in their teens, suggesting possible self-treatment of pathology later addressed medically.

Critics of the chronic disease model of addiction have argued that people frequently recover on their own, unaided, from SUDs,⁴ but McCabe et al³ show that SUDs in adolescence often carry over into adulthood and may last decades. Teens with SUDs cannot necessarily be expected to age out of their disorders. Consequently, screening in this age group could be leveraged to help estimate adult SUD and the risk of adverse health outcomes, including overdoses. By identifying the severity of SUD in adolescence as a variable suggestive of future problems, this study highlights the potential value of pediatric screening that captures the intensity of substance use as well as the need for interventions aimed to reduce the severity of SUD in this age group.

The study by McCabe et al³ also has implications for our understanding of the neurobiology of addiction, while raising questions of the directionality of the associations. The association between adolescent and midlife SUD may reflect underlying vulnerabilities that manifest early and persist throughout life. For example, in some instances, the association of adolescent SUD with later use of prescription medications for pain, sleep disturbance, and anxiety could reflect underlying pathology in adolescence that leads to drug use as self-medication, which in adulthood transitions to (or expands to encompass) seeking medical help for those conditions. However, the patterns shown in the study³ could also reflect neuropathology triggered by the frequent use of drugs during adolescence, which results in symptoms that are then treated by physicians later in life.

The findings from McCabe et al³ identify training, support, and research needs. The American Academy of Pediatrics recommends following the screening, brief intervention, and referral to treatment model as part of routine visits in pediatric primary care,⁵ but implementation of that model would benefit from training of clinicians and referral guidelines and resources for the more severe

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cases. There is also a need to validate screening tools appropriate for clinical settings that can capture drug use and its severity among adolescents to help identify those who are at high risk for SUD.

Similarly, there is also a need for interventions aimed at decreasing substance use among those who are at risk for an SUD and at decreasing SUD severity among those who may have already developed an SUD. Preventing transition from subthreshold opioid use disorder to a more severe disorder is an active area of research under the National Institutes of Health Helping to End Addiction Long-term Initiative. Finally, research is needed to better understand the directionality of the associations revealed by this study,³ including the potential links between drug use in adolescence and subsequent pain conditions in adulthood.

The McCabe et al³ study necessarily leaves some questions unanswered. The use and misuse of prescription stimulants, which are among the prescription drugs most frequently misused by adolescents, was not investigated. Furthermore, smoking history was not studied as a variable, even though there is evidence that nicotine use may potentiate the rewarding properties of other drugs⁶ and could be associated with SUD trajectories in the transition from adolescence to adulthood.⁷ Future studies that look at stimulants and nicotine would help clarify the interesting picture about lifetime SUD that McCabe et al³ have painted with their important study.

McCabe et al³ highlight the limitation of survivorship bias, which can lead to underestimation of the magnitude of adolescent SUD. They note that attrition in longitudinal studies of substance use is associated with greater levels of SUD, raising the possibility that their analysis missed capturing the worst consequences of lifelong substance use, including overdose. Also, given that Monitoring the Future is a school-based survey, even at baseline the study cannot capture youth who have left school or who are incarcerated, for whom levels of drug use and SUD may be higher than for their in-school peers.

The findings about the long-term consequences of adolescent SUD point to the need for screening of SUD in adolescents and for interventions that are graded to its severity, including for mild SUD and for reducing severity in those with moderate or severe SUD. Drug use and related behavioral problems are preventable when communities, schools, and health care systems are willing to invest in evidence-based prevention and therapeutic interventions appropriate to the youth's risks. For this to occur, health care systems must incorporate screening for drug use and SUD, including SUD severity, in office visits, and ensure that screening, prevention, and quality treatment are reimbursable by insurance.

ARTICLE INFORMATION

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