

Changes in Cannabis Use Among Young People

Impact on Mental Health

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Abstract and Introduction

Abstract

Purpose of review The aim of this review was to examine current trends in cannabis use and cannabis use disorder (CUD) among youth, and to investigate recent findings concerning the relationship between cannabis use and mental health concerns, with a focus on how use during adolescence may interact with related mental health disorders.

Recent findings Current data indicate that cannabis use among adolescents has shown both marginal increases and decreases, depending on global location; however, the profile of cannabinoids in cannabis may now be biased toward those that promote psychotogenic and memory-impairing effects. CUD has been found most prevalent among youth. After controlling for multiple confounders, longitudinal research suggests that cannabis use predicts the development of anxiety disorders, depression, suicidal ideation, certain personality disorders, and interpersonal violence. Further, associations have been found stronger in adolescents relative to adults, and younger age of initiation increases the risk of developing mental health disorders.

Summary Cannabis use among youth remains prevalent, and recent studies are consolidating previous findings that adolescents are especially vulnerable to mental health disorders associated with cannabis. This suggests that cannabis involvement requires increased prominence in research, prevention initiatives, routine screening, and interventions to improve adolescent mental health.

Introduction

Adolescence and young adulthood are pivotal points in physical and psychosocial development, and herald the rise of behaviours that are determinants of health and may increase the risk of health problems throughout the life course. In this period, mortality rises due to preventable causes and risk factors such as alcohol, tobacco and other drug use that can lead to, or exacerbate, chronic non-communicable disease states and the precipitation of mental health disorders.^[1] Internationally, the health of adolescents has improved much less markedly than that of younger children.^[2] The leading cause of death in this age group is injury and the majority are avoidable. Incident disability increases with age throughout adolescence, with the contribution of mental disorders rising sharply across this period and making up the largest contributor to the burden of diseases in those aged 10–24 years.^[3]

Cannabis Use Trends

Cannabis use is an important public health issue within this broader context, as it is typically

initiated during adolescence and peaks in early adulthood, before declining in the majority of users who embrace new roles and responsibilities. Current epidemiological data confirm long-established trends of its dominance as the most widely used illicit drug globally,^[4] with high rates among adolescents and young adults.^[5-9]

Recent data on the mental health of the Australian population^[9] indicate that 16–24-year-olds have the highest national prevalence of past-year Diagnostic and Statistical Manual-IV cannabis use disorder (CUD) (2.4%), which commences at a mean of 19.8 years, and is significantly related to the presence of affective and alcohol use disorders. It is well established that early and frequent cannabis use during adolescence is strongly associated with increased risk for ongoing problematic cannabis and other substance use, and a variety of adverse life outcomes in adolescence and young adulthood, including poor mental health,^[10] although these associations may at least partially reflect common pathways among those who use cannabis and those with poor outcomes. This association is highlighted by two recent population-based studies that confirm the association between early age of cannabis use and increased rates of subsequent illicit drug use and use disorder;^[11] and extend these findings, with regular cannabis use in young adulthood increasing the likelihood of cigarette smoking and other illicit drug use uptake, and decreasing the likelihood of alcohol, cigarette smoking and other illicit drug use cessation, into the late 20s.^[12] In addition to the impacts of continued cannabis use itself, this may have indirect effects on mental health through the development of other substance use disorders, as well as via the known impacts of other substance use on mental well-being.

There is mixed evidence on current use trends, although overall cannabis use appears to be stabilizing or declining in some regions (e.g. western Europe, USA and Australia) after increased use throughout the 1990s and early 2000s.^[4] Inconsistent use rates and trends are evident among young people.^[1] For example, there is some evidence of continued increases in recent use among secondary school students in the US accompanied by decreases in perceived risks of use.^[6] By comparison, there were marked decreases in reported past-year use among Australian school children between 1996 and 2005.^[13] However, two recent studies employing robust age–period–cohort analyses have challenged the interpretation of increased cannabis use trends in young people as being unique to more recent birth cohorts. Analysis of data from the 1985 to 2009 US National Survey of Drug Use and Health found that, whereas cannabis use rates were highest among younger age groups, the positive, independent influence of cohort membership was smaller for today's youngest cohorts than those previous, and the lowest in 30 years.^[7] A recent^[8] analysis using seven waves of data from the 1990 to 2009 German Epidemiological Survey of Substance Abuse, although similarly reporting greatest use among younger age groups, found no overall effect of cohort or historical period. As has been seen with other psychoactive drugs, there is now preliminary evidence of a faster transition from initiation of cannabis use to regular use in females compared with males.^[14]

Three other related empirical findings/trends are of note here. Firstly, this outlook may be tempered somewhat by evidence that the recent trend of decreasing age of cannabis use initiation (in Australia at least) may have been halted or reversed.^[15] Secondly, data indicate a possible prolongation of the window for initiation of cannabis use well into the 20s, possibly due to delays in the uptake of adult roles and responsibilities.^[16] It is unclear as to what the overall effects of these trends may be. Whereas later use onset may ameliorate some of the likely impacts of cannabis use on the developing adolescent brain, it is not clear how widespread this phenomenon is or whether current trends will continue, or what the longer-term impacts of an expanded period of use initiation may be in terms of later problematic use or mental health. Finally, trends in the cannabinoid profile of cannabis over the past two decades may bias contemporary cannabis towards higher delta-9-tetrahydrocannabinol (THC) and low cannabidiol (CBD) content. While

there is enormous variability in the level of these cannabinoids (commonly referred to as cannabis potency), some data do indicate that CBD may prevent or inhibit the psychotogenic and memory-impairing effects of THC.^[17–19] Thus, there is concern that consumption of high THC/low CBD cannabis may be linked to adverse mental health. However, despite this putative biological mechanism, there remains scant literature on the impacts of current cannabinoid profiles on the mental health of users.

Nature of the Association

Much is speculated on the nature of the association and the question of causality or common underlying pathways between cannabis use and mental health outcomes, and the nature of this review precludes their discussion. There are multiple candidates as mediators in the association between cannabis use and anxiety, and other mental health conditions. These include the role of adolescent neuro-developmental changes in general,^[20,21] and the endocannabinoid system, in particular,^[22] trauma such as childhood maltreatment,^[23] length of exposure to cannabis^[24] and age of initiation.^[25]

The issue of the heritability of cannabis-related phenotypes is also the subject of a growing literature, typically abuse and dependence symptomatology.^[26] Twin studies have reported that the rates of other drug use disorders and common psychiatric conditions are highly correlated with the extent of cannabis involvement. There is consistent evidence of heritable influences across a range of cannabis phenotypes such as early opportunity to use (on or before 15 years) (h^2 72%), early initiation of use (on or before 16 years of age) (h^2 80%), using more than 11 times (h^2 76%) and cannabis use disorders (including dependence) (h^2 72%).^[11]

Cannabis and Anxiety Disorder

The nature and extent of the association between cannabis use and the more common mental health disorders of anxiety and depression is of growing research and public health interest. Cross-sectional studies have often found elevated rates of anxiety disorders among cannabis users, but these associations have not always persisted after confounding variables were considered.^[27] Longitudinal prospective studies have also been inconsistent, with some finding the association stands when confounders are considered^[28] but not others.^[29] A recent study has examined the cross-sectional and prospective associations between cannabis use and mental health in a school-based representative cohort studied over nine waves from age 15 to 29 years. It reported that heavier adolescent cannabis use was associated with an approximate doubling of the risk of anxiety disorder, particularly if use continued at 29 years.^[16] Cross-sectionally, they found a similar level of risk at 29 years of age for those who had not used cannabis regularly (weekly or more often) over the course of their adolescence, but were using at age 29 years. Furthermore, there was an increased risk of anxiety disorders at age 29 years among those who smoked cannabis in adolescence even if they ceased using in adulthood.^[16] Multiple potential confounders were considered, including background factors, concurrent alcohol and other illicit drug use, and any adolescent anxiety or depression of clinical significance, with the relationship between anxiety disorders and cannabis use remaining robust.

The study by Degenhardt *et al.*^[16] was also able to discount two of the proposed explanations of the relationship between cannabis use and anxiety and depression. Firstly, the hypothesis that cannabis users have an increased risk of social adversities, such as divorce, which in turn affect their mental health, is refuted as no such relationship for major depressive episodes was found in this study. Secondly, the general theory that lower hypothalamic–pituitary–adrenal (HPA) axis activity is responsible is also dismissed as under-aroused HPA axis has not been associated with

anxiety.^[30]

Cannabis and Depression

While there was no consistent association between cannabis use and depression found in the mid-secondary school cohort reported on by Degenhardt *et al.*,^[16] this is not a typical finding of cross-sectional and cohort studies exploring this question. A body of evidence shows that the use of cannabis is frequently associated with an increased risk of major depression^[31] and suicidal behaviours.^[32] The nature of the relationship is also controversial, with some studies not supporting a causal association,^[32] but instead linking cannabis use problems with depression due to uncontrolled sources of residual confounding that increase the risk of both cannabis use and mental health problems.

A significant advance in the evidence base on this question has recently been reported. Horwood *et al.*^[10] combined four high-quality cohort studies, three of which were birth cohorts of up to age 30 years duration. The linkage of these data sets explored the question of the strength of the association between cannabis use and depression, the role of non-observed fixed sources of confounding and the extent to which the association varies with age. In summary, they found that increasing frequency of cannabis use was associated with increasing depressive symptoms that persisted when confounding non-observed fixed effects were included in the analyses. An age effect was also observed, where the association was stronger in adolescence and declined thereafter.^[10]

Suicidal Ideation

In developed countries, suicide is now the second leading cause of death among 10–24-year-olds;^[33] hence any preventable risk factor is potentially of great public health importance. There is a substantial epidemiological^[34] and emerging economic literature^[35] that identifies cannabis use as an important risk factor for suicidal behaviours. Heritability studies have also identified the role of cannabis dependence in the increased risk (in the order of 2.5–2.9 times) of suicidal ideation and suicide attempts.^[36] The same study also reported that those who initiated cannabis prior to the age of 17 years had elevated rates of subsequent suicide attempts (of around 3.5 times).^[36]

A recent analysis of a 30-year birth cohort from an economic perspective sheds light on the association between cannabis use and suicidal ideation.^[37] It investigated whether regular cannabis use leads to the onset of suicidal ideation or the reverse causal direction was supported. Using the very rich data set they were able to control for all known confounding characteristics of the individual, their parents and the socio-economic background of the family, and employed a variety of sensitivity analyses including levels of cannabis use, missing information and the endogenous relationship between the two variables. They found that cannabis use at the intensity of several times per week led to higher rates of transition into suicidal ideation in subsequent study waves for males only and no evidence that suicidal ideation leads to cannabis use for either sex.^[37]

Less Common Disorders

While the association between cannabis use and schizophrenia is the most well studied, it is not the focus of this study. Compared with even depression and anxiety, however, the literature on the association between cannabis use and other mental health disorders is particularly scant. Bipolar disorder and disorders of the bipolar spectrum are the sixth leading cause of disability globally.^[38] With between 20 and 50% of those with bipolar disorder endorsing some form of cannabis-related

problems,^[39] a recent, large case–control study has found that individuals with bipolar disorder were 6.8 times more likely to report a lifetime history of cannabis use than controls.^[40] They further reported 29.4% of those with bipolar disorder had comorbid cannabis use disorders and these were independently associated with increased suicide attempts, experiencing mixed mania and depression, and disability.^[40]

Cannabis use has also been associated with axis II disorders. A recent community-based longitudinal study examined the predictive value of cannabis use during childhood and early adolescence on schizotypal personality disorder (SPD) symptoms projecting into adulthood. It found that cannabis use that was initiated before the age of 14 years strongly predicted SPD symptoms in adulthood, independent of a wide range of confounding factors, including early adolescent SPD symptoms, other drug use, and major depression and anxiety.^[41] An exploratory study of 199 recent adolescent cannabis users has also suggested that frequency of cannabis use was higher with those identified in the borderline and impulsive clusters.^[42] Further research on the associations between cannabis use, personality disorders and axis I disorders is a fruitful line of enquiry to tease out any causal links, particularly those using carefully controlled, prospective methodologies.

Issues for Service Delivery

The rates of cannabis use among adolescents attending mental health services is well established,^[43] with recent evidence of 7% of young adolescents across a large early intervention mental health service using cannabis at least weekly.^[44] One of the clinical implications of this is that persistent cannabis use has been linked to poorer intervention outcomes and levels of service engagement.^[45]

A further behaviour that should be targeted amongst those who present to any health or social services with cannabis use as part of their presentation is intimate partner violence. Data from four waves of adolescents involved in the US National Longitudinal Study of Adolescent Health revealed that consistent use of cannabis during adolescence was most predictive of involvement in intimate partner violence as either victim or perpetrator, independently of alcohol use.^[46] Further, consistent cannabis use was related to an increased risk of being only a perpetrator of such violence. Of note, males were more likely to be victims of intimate partner violence than perpetrators compared with females.^[46]

Conclusion

The body of research affirming the link between cannabis use and numerous mental health concerns continues to grow, with evidence suggesting that causation may be likely in some conditions. Adolescence is a time of highest vulnerability to mental health disorders attributable to cannabis, and regular use is predictive of less successful outcomes in mental health treatment. The pervasive involvement of cannabis use in the development and maintenance of mental health disorders suggests a need to administer cannabis screening to adolescents presenting to mental health treatment, and that cannabis requires increased prominence in research, prevention initiatives and interventions concerning adolescent mental health.

Sidebar

Key Points

- Current data indicate that cannabis use disorder is most prevalent among youth.
- Regular cannabis use during adolescence doubles the risk of adulthood anxiety disorders.
- The relationship between cannabis use and depression is strongest during adolescence.
- Adolescent cannabis use is linked with suicidal ideation and personality disorders.
- Mental health services for adolescents will benefit from increasing their focus on cannabis.

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Papers of particular interest, published within the annual period of review, have been highlighted as:

* of special interest

** of outstanding interest

Additional references related to this topic can also be found in the Current World Literature section in this issue (p. 417).

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