



IMPACT OF CANNABIS USE ON DEVELOPMENTAL MILESTONES IN YOUTH USERS

Dr. Aditi^{1*}, Dr. Bibin C F², Dr. Ayushi Srivastava³, Dr. Shekhar saini⁴

^{1*}(<https://orcid.org/0009-0009-0722-7711>), (aditikaushik128@gmail.com)

²(<https://orcid.org/0009-0003-0470-6019>) (cfbibin123@gmail.com)

³(<https://orcid.org/0009-0001-7632-404X>) (ayushipk@gmail.com)

⁴(<https://orcid.org/0009-0003-0933-463X>), (shekhsaini1998@gmail.com)

***Corresponding Author:** Dr. Aditi

(<https://orcid.org/0009-0009-0722-7711>), (aditikaushik128@gmail.com)

Abstract - The impact of cannabis use on developmental milestones in youth users is a significant concern. cannabis use during adolescence can have lasting effects on cognitive function, brain development, and mental health.

I. Introduction

In recent years, the discourse surrounding cannabis use has evolved significantly, particularly regarding its impact on youth. With increased legalization and societal acceptance, it is crucial to scrutinize how cannabis consumption affects developmental milestones in young users. Adolescents, a group marked by pivotal psychological and physical growth, may experience unique vulnerabilities to cannabis impairing effects, such as diminished executive functioning and motivation. This is particularly concerning given that such impairments can hinder academic and social development, leading to long-term consequences (Reyam N Nassif, p. 15615). Moreover, studies indicate that understanding the ramifications of cannabis legalization is essential; different states exhibit varied policy impacts on youth behavior and health outcomes (Zvonarev V et al., p. 5806). Thus, exploring the relationship between cannabis use and developmental milestones among youth is critical for shaping effective health policies and educational strategies that support healthy growth and wellbeing.

A. Overview of cannabis use trends among youth and its relevance to developmental milestones Cannabis use among youth has been increasingly prevalent, with trends indicating a gradual rise in both initiation and frequency of use. This phenomenon is particularly concerning given its potential impact on critical developmental milestones such as cognitive function, emotional regulation, and academic achievement. The adolescent brain, still undergoing significant maturation, is especially vulnerable to the neurochemical alterations associated with cannabis use. Research has shown that frequent cannabis consumers may face heightened risks of dependence, with significant distinctions between users who develop dependency and those who do not, as outlined in (Peggy van der Pol). Additionally, societal debates surrounding cannabis often overlook the nuanced implications for

young users, reinforcing the need for informed discourse in contexts where youth might engage in regular use, as discussed in (Alan J Budney et al.). Consequently, understanding these trends is vital to addressing their implications for developmental trajectories among adolescents.

II. Cognitive Development

Cognitive development during adolescence is a critical period marked by significant brain maturation, which influences reasoning, problem-solving, and decision-making abilities. As cannabis use becomes more prevalent among youth, there are growing concerns about its potential impacts on these developmental milestones. Research indicates that early exposure to cannabis can lead to alterations in brain connectivity and function, impairing cognitive processes such as memory formation and executive functioning. Furthermore, intervention strategies like Moti-4 have been designed to mitigate cannabis use among adolescents and encourage behavioral change, demonstrating positive outcomes in reducing consumption and enhancing motivation to alter drug use behavior (Adriana et al.). Despite potential therapeutic applications, the cognitive risks associated with cannabis use, including detrimental effects on attention and learning, raise alarm regarding its long-term implications on mental health and academic performance among adolescents (Donald E Greydanus et al.). These factors underscore the necessity for comprehensive education and prevention strategies in addressing adolescent cannabis use.

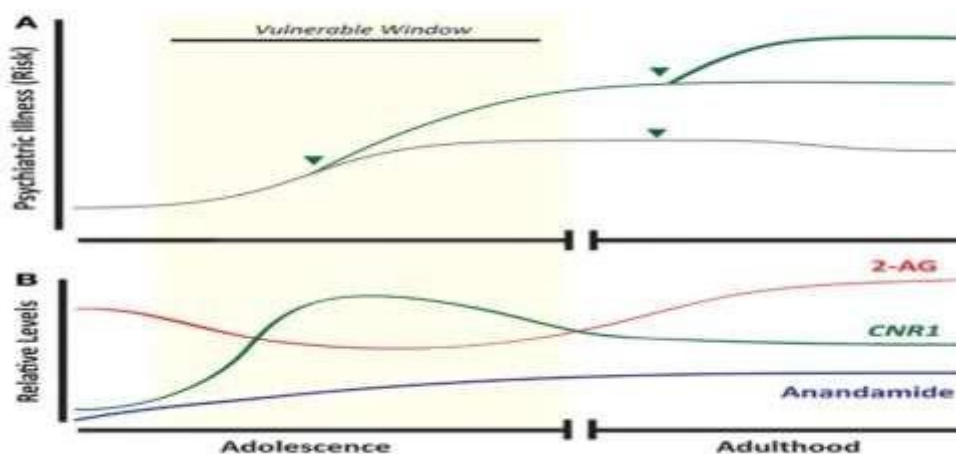
A. Effects of cannabis on memory, attention, and learning abilities in adolescents

Cannabis use among adolescents significantly influences cognitive functions, particularly memory, attention, and learning abilities, setting back critical developmental milestones. Research indicates that young users often demonstrate impaired academic performance, attributed to the drugs effects on short-term memory and focus, which are pivotal during formative years. Additionally, the rise in recreational marijuana use, especially amid disruptions such as the Covid-19 pandemic, has exacerbated these cognitive risks, leading to notable declines in classroom engagement and motivation (Milton J Valero R, p. 112-118). This impairment resonates with phenomena linked to excessive reliance on digital devices, termed digital dementia, which further undermines cognitive development by affecting emotional regulation and attention (Ali Z et al., p. 70029). As adolescents increasingly confront complex academic environments, understanding the ramifications of cannabis on their cognitive capabilities is essential for developing effective interventions and policies aimed at safeguarding youth health and educational success.



III. Social and Emotional Development

The influence of cannabis use on social and emotional development in youth is a critical concern as it intersects with various developmental milestones. Research indicates that prenatal exposure to cannabis can lead to adverse outcomes in aggression, cognitive ability, and behavioral issues in children, which can hinder their social interactions and emotional regulation ((Gisondi V et al., p. 0114)). Furthermore, the relatively unstudied nature of recreational cannabis use among the youth raises alarms, as it has been linked to developmental challenges that can impede healthy socialization and emotional maturity ((Mansell H)). The effects of cannabis on the adolescent brain, particularly regarding impulse control and decision-making, may exacerbate these challenges, leading to increased risks of social withdrawal and emotional distress. Given the significant implications of these developmental setbacks, it becomes imperative to promote educational initiatives that foster awareness about cannabis risks and support healthy emotional and social development in youth users.

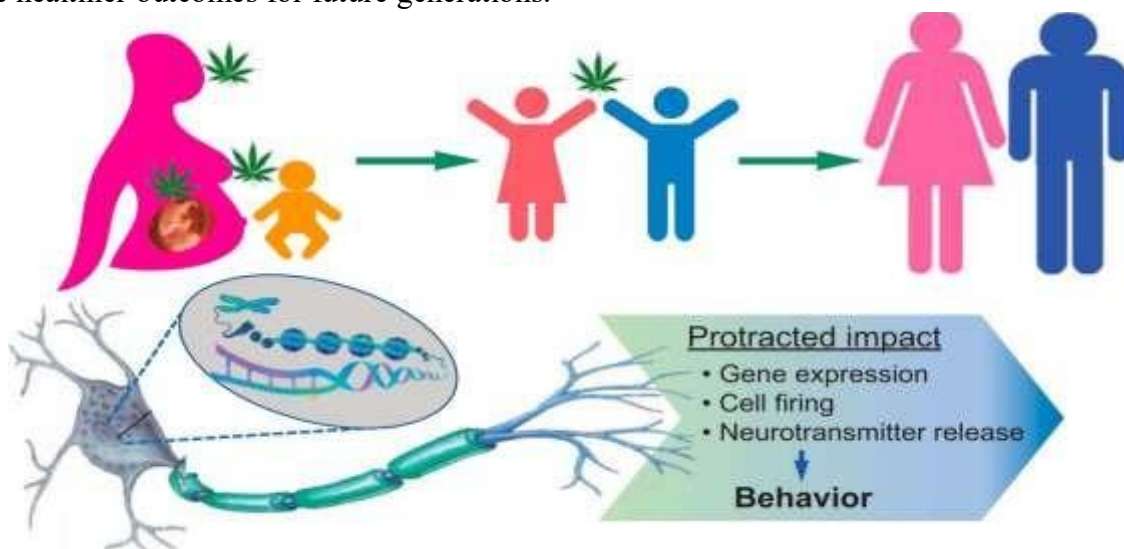


A. Impact of cannabis use on peer relationships and emotional regulation in youth

The influence of cannabis use on peer relationships and emotional regulation in youth can be profound, affecting their overall social development. Studies indicate that cannabis consumption during adolescence disrupts the maturation of the prefrontal cortex, which is crucial for impulse control and emotional regulation, potentially leading to difficulties in forming and maintaining peer relationships (Brockhagen S, p. 60-62). The impairments in cognitive function and emotional stability may result in increased social withdrawal or aggression, further complicating interactions with peers. Moreover, the societal acceptance of cannabis, particularly with its legalization for medical and recreational purposes, may create dilemmas for young users, who may be caught between peer pressure and the need to conform to social norms (Mansell H). Consequently, as youth navigate this complex terrain, fostering healthy relationships and developing sound emotional regulation becomes increasingly challenging, highlighting the need for targeted interventions to support their social and emotional development in the context of cannabis use.

IV. Conclusion

In conclusion, the evidence surrounding the impact of cannabis use on the developmental milestones of youth users reveals significant concerns that cannot be overlooked. Adolescent brain development, particularly in areas responsible for decision-making, impulse control, and emotional regulation, is profoundly influenced by cannabis exposure. Studies indicate that early and frequent use can lead to cognitive impairments and hinder educational achievement, which are critical during formative years. Furthermore, the social and emotional ramifications of cannabis use may exacerbate existing vulnerabilities in youth, leading to long-term consequences such as increased risk for mental health disorders (Riggs P et al.). Consequently, it is imperative for parents, educators, and policymakers to engage with these findings to cultivate informed discussions about cannabis. By prioritizing prevention and education, society can mitigate the adverse effects on young peoples development and ensure healthier outcomes for future generations.



A. Summary of findings and implications for policy and education regarding youth cannabis use As cannabis use among youth continues to raise significant public health concerns, it is imperative to analyze the findings related to its impact on developmental milestones and the subsequent implications for policy and education. Research indicates that structured interventions, such as Moti4, have successfully reduced cannabis use and enhanced motivations to change behavior among adolescents, revealing the effectiveness of evidence-based strategies in this realm (Adriana et al.). Furthermore, the health status of young males, a demographic particularly susceptible to risky behaviors including substance use, underscores the urgency for targeted educational programs that address cannabis-related risks and promote healthy habits (N/A). By prioritizing comprehensive

education on the developmental consequences of cannabis use and reinforcing preventive measures, policymakers can foster more informed choices among youth, ultimately supporting healthier developmental trajectories and reducing potential long-term health consequences.

References

1. Adriana, G. (Gerald), Dupont, H.B. (Hans B.), Lemmens, P. (Paul), Mheen, et al.. "Developing the Moti-4 intervention, assessing its feasibility and pilot testing its effectiveness" 'Springer Science and Business Media LLC', 2015, doi: <https://core.ac.uk/download/43290818.pdf>
2. Donald E. Greydanus, Elizabeth K. Hawver, Joav Merrick, Megan M. Greydanus. "Marijuana: Current Concepts†" 'Frontiers Media SA', 2013, doi: <https://core.ac.uk/download/pdf/82852516.pdf>
3. Adriana, G. (Gerald), Dupont, H.B. (Hans B.), Lemmens, P. (Paul), Mheen, et al.. "Developing the Moti-4 intervention, assessing its feasibility and pilot testing its effectiveness" 'Springer Science and Business Media LLC', 2015, doi: <https://core.ac.uk/download/43290818.pdf>
4. N/A. "The health of Australia's males: from birth to young adulthood (0-24 years)" Australian Institute of Health and Welfare, 2025, doi: <https://core.ac.uk/download/pdf/30676321.pdf>
5. Reyam N. Nassif. "Cannabis Use in Muslim Youth" Cureus, 2021, e15615. doi: <https://www.cureus.com/articles/60047-cannabis-use-in-muslim-youth.pdf>
6. Valeriy Zvonarev, Tolulope A. Fatuki, Polina Tregubenko. "The Public Health Concerns of Marijuana Legalization: An Overview of Current Trends" Cureus, 2019, e5806. doi: <https://www.cureus.com/articles/23167-the-public-health-concerns-of-marijuana-legalizationan-overview-of-current-trends.pdf>
7. Milton J. Rojas Valero. "Recreational Marijuana Use and Its Effects on Cognitive Skills in Adolescents" Mental Health & Addiction: An Integrated Care in Latin America, 2025, 112-118. doi: <https://cdspress.ca/wp-content/uploads/2023/06/CHAPTER-5-RECREATIONALMARIJUANA-USE-AND-ITS-EFFECTS-ON-COGNITIVE-SKILLS-INADOLESCENTS.pdf>
8. Zeeshan Ali, Jayaprakash Janarthanan, Prasanna Mohan. "Understanding Digital Dementia and Cognitive Impact in the Current Era of the Internet: A Review" Cureus, 2024, e70029. doi: <https://www.cureus.com/articles/278251-understanding-digital-dementia-and-cognitive-impactin-the-current-era-of-the-internet-a-review.pdf>
9. Victoria Gisondi, Jigar R Katwala, Jeevan Divakaran. "A Systematic Review of the Association Between Prenatal Cannabis Usage and the Impact on Behavior and Cognitive Skills in Children" Cronicon, 2023, 01-14. doi: <https://preventionconversation.org/wpcontent/uploads/2023/12/ECPE-12-01390.pdf>
10. Holly Mansell. "Selective Studies on the Challenges of Cannabis Use in Children, Youth, and Young Adults" University of Saskatchewan, 2022, doi: <https://harvest.usask.ca/bitstream/10388/14141/1/MANSELL-DISSERTATION-2022.pdf>
11. Peggy van der Pol. "The dynamics of cannabis use and dependence" Universiteit van Amsterdam, 2014, doi: <https://dare.uva.nl>
12. Alan J Budney, Catherine Stanger. "Cannabis Use and Misuse" International Association for Child and Adolescent Psychiatry and Allied Professions, 2012, doi: <https://www.uniad.org.br/wp-content/uploads/2012/07/G.2-CANNABIS-072012.pdf>
13. Saba Brockhagen. "Impact of Recreational Substance Use On the Adolescent Brain" American Journal of Student Research, 2025, 60-62. doi: <https://doi.org/10.70251/HYJR2348.336065>
14. Holly Mansell. "Selective Studies on the Challenges of Cannabis Use in Children, Youth, and Young Adults" University of Saskatchewan, 2022, doi: <https://harvest.usask.ca/bitstream/10388/14141/1/MANSELL-DISSERTATION-2022.pdf>

15. Paula Riggs, Jesse D. Hinckley, J. Megan Ross. "Adolescent Cannabis Use, An Issue of Psychiatric Clinics of North America, E-Book" Elsevier Health Sciences, 2023-10-27, doi: https://play.google.com/store/books/details?id=8ZrxEAAQBAJ&source=gbs_api