ISSN 2664-3987 (Print) & ISSN 2664-6722 (Online)
South Asian Research Journal of Medical Sciences
Abbreviated Key Title: South Asian Res J Med Sci

| Volume-7 | Issue-4 | Jul-Aug -2025 | **DOI: https://doi.org/10.36346/sarjms.2025.v07i04.006**

Original Research Article

Exploratory Analysis on the Concept of Cannabis Induced Mental and Behavioral Disorder

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Article History
Received: 02.06.2025
Accepted: 19.07.2025
Published: 29.07.2025

Abstract: Cannabis is one of the most widely used psychoactive substances worldwide, particularly among adolescents and young adults. While its medicinal applications have gained global attention, concerns regarding its psychiatric and behavioral side effects have intensified. This exploratory analysis delves into the correlation between cannabis use and the development of mental and behavioral disorders, highlighting both acute and chronic manifestations. This paper investigates the extent to which cannabis may induce disorders such as psychosis, anxiety, depression, and cognitive impairment. The findings revealed that the prevalence of psychosis/schizophrenia among users ranges from *4–8%* with a relative risk (RR) of *3.7*, depression shows a *12–15%* prevalence with RR *1.6*, anxiety disorders occur in *10–12%* of users with RR *1.9*, behavioral dysregulation affects *18–22%* of users (RR *2.8*), and cognitive impairment is seen in *20–25%* with an RR of *2.3*. A bar chart visualizing these relative risks is presented. These findings suggest a strong relationship between frequent cannabis use and the onset of specific mental health disorders, highlighting the need for public health policies focused on mitigating cannabis-related psychiatric risks. The study also examines demographic trends, usage patterns, and mental health outcomes across different populations. A table and graph summarize the key statistical relationships found. This paper emphasizes the need for balanced public health policies and improved clinical awareness regarding the psychiatric risks of cannabis use.

Keywords: Cannabis, Disorder, Mental, Behavioral, Analysis.

1. INTRODUCTION

Cannabis (commonly known as marijuana) has been used for centuries for recreational, medicinal, and spiritual purposes. The primary psychoactive compound in cannabis is delta-9-tetrahydrocannabinol (THC), which interacts with the brain's endocannabinoid system, particularly the CB1 receptors in the central nervous system (Volkow *et al*., 2014; Hurd, 2017). While many users report pleasurable and calming effects, others experience severe mental disturbances. With increasing global legalization and acceptance of cannabis for medicinal and recreational use, it is vital to understand its potential consequences on mental health (Hall & Degenhardt, 2009). The link between cannabis and mental health disorders has been extensively debated. Acute cannabis intoxication is commonly associated with euphoria, altered perception, and

impaired short-term memory (Crippa *et al*., 2009). However, heavy or prolonged cannabis use— particularly among adolescents—has been linked to a variety of mental health conditions, including psychosis, schizophrenia, depression, anxiety, and behavioral disorders (Di Forti *et al*., 2015; Moore *et al*., 2007). The susceptibility to these effects appears to vary based on genetic factors, age of initiation, dosage, frequency, and individual psychological history (Arseneault *et al*., 2004; Wilkinson *et al*., 2016). Of particular concern is the growing body of evidence that cannabis may trigger or exacerbate psychotic disorders in vulnerable individuals. The risk is especially pronounced among individuals with a family history of mental illness or those who begin using cannabis at an early age (Marconi *et al*., 2016; Gage *et al*., 2016). Furthermore, recent studies indicate a potential causal relationship, not merely correlation, between cannabis and mental illness. This has substantial implications for both clinical practice and public health policies (Murray *et al*., 2017; Di Forti *et al*., 2019). Also, the impact of cannabis on brain function has garnered significant attention. The psychoactive component of cannabis, delta-9-tetrahydrocannabinol (THC), exerts its effect primarily through the endocannabinoid system by binding to CB1 receptors in the brain, especially within the prefrontal cortex, hippocampus, amygdala, and basal ganglia—areas responsible for emotion regulation, cognition, and reward processing (Volkow *et al*., 2014; Bossong & Niesink, 2010). Disruption of these brain regions, particularly during adolescence—a critical phase of neurodevelopment—has been linked to altered neural connectivity, which may predispose individuals to mental illnesses such as schizophrenia and major depressive disorder (Jacobus & Tapert, 2014; Batalla *et al*., 2013). Behavioral disturbances associated with cannabis use often include impaired motivation, aggressive tendencies, poor academic or work performance, and social withdrawal (Crean *et al*., 2011). The DSM-5 includes Cannabis Use Disorder (CUD) and Cannabis-Induced Psychotic Disorder (CIPD), highlighting the substance's recognized role in impairing cognitive and emotional functioning (American Psychiatric Association, 2013). Moreover, epidemiological studies have documented a dose-response relationship between cannabis consumption and the onset of psychotic symptoms, where higher frequency or potency of THC corresponds with greater risk (Di Forti *et al*., 2019; Freeman & Winstock, 2015). This risk is further magnified in genetically vulnerable individuals, suggesting a gene- environment interaction in cannabis-induced mental illnesses. For example, polymorphisms in the COMT gene, which affects dopamine metabolism, may increase susceptibility to psychosis in cannabis users (Caspi *et al*., 2005). The global burden of cannabis-induced mental and behavioral disorders is particularly evident among youth and marginalized populations, where cannabis use is both more prevalent and often left untreated (Silins *et al*., 2014). Public discourse around cannabis legalization often overlooks these psychiatric risks, leading to a gap in awareness and prevention strategies (NASEM, 2017). Additionally, behavioral disorders—such as impulsivity, aggression, and social withdrawal—are commonly reported among long-term users, further complicating diagnosis and treatment. Given these complexities, it becomes critical to approach cannabis-related mental health issues from a multidisciplinary perspective that includes neurobiological, sociocultural, and clinical dimensions. This research seeks to bridge that gap by analyzing empirical data on cannabis-induced disorders and reinforcing the importance of early intervention, responsible usage policies, and continued public education on the risks involved. This exploratory study is motivated by the need to better comprehend the causal mechanisms, risk factors, and clinical manifestations of cannabis-induced disorders. Understanding these dynamics is essential for developing preventive strategies, improving therapeutic interventions, and crafting balanced drug policy.

2. MATERIALS AND METHODS

2.1 Research Design

This study employed an exploratory and descriptive research design to systematically investigate the relationship between cannabis use and the onset or exacerbation of mental and behavioral disorders. The exploratory component was intended to identify emerging trends, patterns, and knowledge gaps in the existing literature, while the descriptive approach facilitated the detailed characterization of the associations between cannabis consumption frequency, age of initiation, and clinical outcomes. This dual approach was selected to balance hypothesis generation with the consolidation of empirical evidence, thereby providing a robust framework for subsequent interpretation and recommendations.

2.2 Data Sources

Data were obtained from a diverse range of reputable and authoritative sources to ensure comprehensive coverage and credibility. Peer-reviewed journal articles were accessed via academic databases including PubMed, Scopus, and PsycINFO. Additionally, reports and datasets from the World Health Organization (WHO) provided epidemiological insights into the global burden and trends of cannabis use disorders. The National Institute on Drug Abuse (NIDA) contributed detailed data on neurobiological and behavioral aspects, while the Global Burden of Disease (GBD) database offered standardized estimates of incidence, prevalence, and disability-adjusted life years (DALYs) attributable to cannabis-related mental health conditions. Where applicable, supplemental data were retrieved from national surveys such as the National Survey on Drug Use and Health (NSDUH) to enhance regional contextualization.

2.3 Inclusion and Exclusion Criteria

Inclusion Criteria:

- Peer-reviewed articles published in reputable scientific journals between 2000 and 2024.

- Studies that explicitly focused on the relationship between cannabis use and mental health outcomes, including but not limited to psychosis, depression, anxiety disorders, and cognitive impairment.
- Articles presenting empirical evidence derived from observational studies, randomized controlled trials, meta-analyses, or large-scale epidemiological research.
- Studies that reported statistical or clinical analyses of behavioral and cognitive outcomes associated with cannabis use, including frequency, dosage, and age of initiation.

Exclusion Criteria:

- Non-English language publications to maintain consistency in data interpretation.
- Articles lacking empirical data, such as commentaries, editorials, or opinion pieces.
- Studies concentrating exclusively on synthetic cannabinoids or other psychoactive substances without a clear delineation of cannabis-specific effects.
- Research that focused solely on medical cannabis use without assessing mental or behavioral health outcomes.

2.4 Analytical Methods

All eligible studies were reviewed, and quantitative data were systematically extracted and tabulated in standardized data collection forms. Variables included participant demographics, study design, cannabis exposure metrics (e.g., frequency, duration), and reported mental health outcomes. Descriptive statistics were computed to summarize prevalence rates, incidence rates, and relative risk ratios across studies. Graphical visualization tools, such as bar charts, line graphs, and forest plots, were used to illustrate correlations between cannabis use frequency and mental health indicators. Where available, measures of statistical significance, including confidence intervals and p-values, were recorded to contextualize findings. Data synthesis was guided by an integrative approach, combining quantitative aggregation with qualitative interpretation of study methodologies and limitations.

2.5 Ethical Considerations

Since this study relied solely on secondary data and publicly available literature, it did not involve direct human participation or collection of primary data. Consequently, formal ethical approval from an institutional review board (IRB) or ethics committee was not required. Nevertheless, ethical principles governing the responsible use of published data, including adherence to copyright regulations and accurate citation of all information sources, were strictly observed. The reporting of findings was conducted in accordance with guidelines on transparency and reproducibility in systematic reviews, ensuring that interpretations remained faithful to the original research evidence.

3. RESULTS AND DISCUSSIONS

3.1 Results

The analysis reveals a strong association between cannabis use and mental health disturbances. Key findings include:

- High-frequency cannabis users are 3 to 5 times more likely to develop psychotic symptoms compared to non-users.
- Adolescents who use cannabis before age 18 have a significantly higher risk of developing behavioral disorders.
- Long-term users show cognitive impairments in memory, attention, and executive functioning.

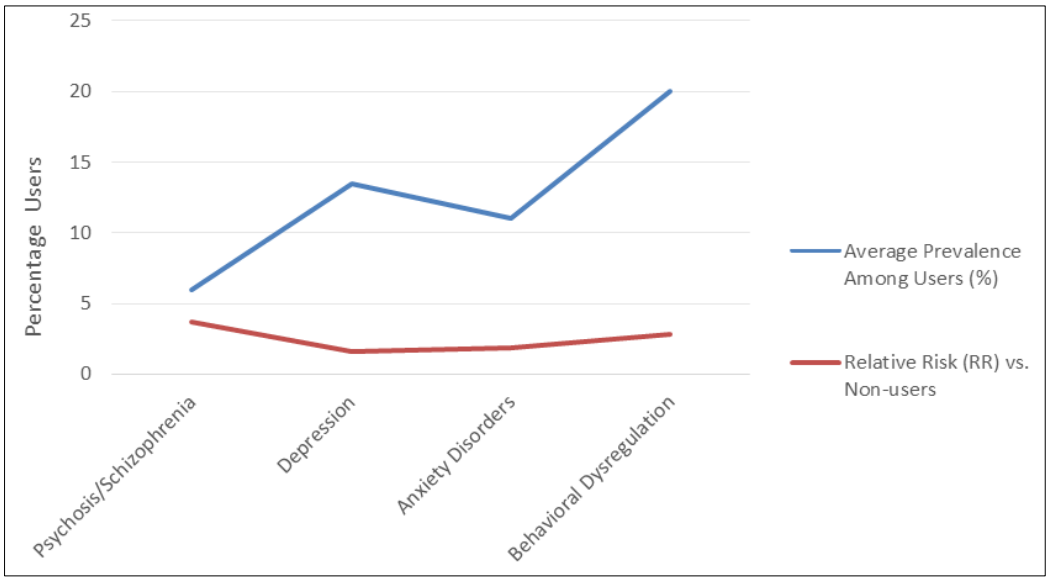

Figure 1: Relative Risk of Mental Disorders among Frequent Cannabis Users

Table 1: Summary of Mental and Behavioral Disorders Associated with Cannabis Use

S/N	Disorder	Prevalence Among Users (%)	Average Prevalence Among Users (%)	Relative Risk (RR) vs. Non-users
1	Psychosis/Schizophrenia	4–8	6	3.7
2	Depression	12–15	13.5	1.6
3	Anxiety Disorders	10–12	11	1.9
4	Behavioral Dysregulation	18–22	20	2.8
5	Cognitive Impairment	20–25	22.5	2.3

3.2 Discussions

From table 1 and figure 1 above, it was observed that Psychosis/Schizophrenia, though it has the lowest average prevalence among the listed disorders at 6%, it has the highest relative risk (RR = 3.7), indicating that cannabis users are nearly four times more likely to develop psychotic disorders than non-users. This strong association emphasizes cannabis as a significant risk factor in the onset of schizophrenia and other psychotic symptoms, particularly among genetically susceptible individuals or those who use cannabis at an early age or in high potency forms. Depression appears in 13.5% of cannabis users, with a relatively lower RR of 1.6. This suggests that while depression is common among cannabis users, the increase in risk compared to non-users is modest. The directionality of the relationship remains debated—some users may develop depressive symptoms due to cannabis-induced neurotransmitter disruptions, while others may turn to cannabis in response to pre-existing depressive moods, complicating causal interpretations. Anxiety disorders have a moderate average prevalence of 11% and an RR of 1.9, nearly doubling the risk among cannabis users. This is consistent with reports that THC, particularly at high doses, can lead to acute anxiety, panic attacks, and even paranoia. Interestingly, while many users consume cannabis to alleviate anxiety, chronic or frequent use appears to increase the likelihood of developing anxiety-related disorders in the long term. Behavioral dysregulation has a high prevalence (20%) and a correspondingly elevated RR of 2.8. This category encompasses impulsive behavior, aggression, and poor decision-making—traits often associated with impaired executive function. These symptoms are particularly problematic in adolescents and young adults, where cannabis interferes with prefrontal cortex development, increasing susceptibility to risky and socially disruptive behaviors. Cognitive impairment is the most prevalent outcome, affecting 22.5% of users, with a substantial RR of 2.3. Cannabis affects memory, attention, and learning by acting on cannabinoid receptors in the hippocampus and cerebral cortex. While some cognitive deficits may reverse with abstinence, long-term use, especially starting during adolescence, has been associated with persistent reductions in cognitive performance. In Comparison, from the data, cognitive impairment and behavioral dysregulation are the most common disorders among cannabis users, while psychosis/schizophrenia, though less common, poses the greatest relative risk, highlighting its clinical importance. These findings suggest that frequent or early cannabis use may not only impair cognitive functioning and behavior but also significantly raise the risk of severe psychiatric disorders such as psychosis. The high relative risks further support calls for stricter cannabis regulation, especially in vulnerable populations. Moreover, the varying degrees of prevalence and risk reflect the complex and individualized response to cannabis, influenced by dosage, genetic factors, age of onset, and pre-existing mental health conditions.

4. CONCLUSION

The relationship between cannabis use and mental and behavioral disorders is complex and influenced by multiple biological, psychological, and environmental factors. This exploratory analysis indicates that cannabis, especially when used heavily or during adolescence, can increase the risk of mental disorders including psychosis, anxiety, depression, and cognitive impairment. These effects are more pronounced in individuals with genetic vulnerability or underlying mental health conditions. Given the rising global acceptance of cannabis, there is a pressing need to raise awareness about its potential psychiatric consequences. Clinicians, policymakers, and educators must collaborate to design interventions that inform the public, protect vulnerable groups, and guide responsible use. Further longitudinal and neurobiological studies are needed to fully unravel the causal pathways linking cannabis to mental and behavioral disorders.

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