Current Research in Health Sciences, 3(2):24–28, 2025. DOI: 10.58613/crhs324

Current Research in Health Sciences

Journal homepage: https://www.gpub.org/journal-details.php?journal-id=47

ISSN (E): 2584-1084

Review Article

Emergence of New Variants of Cannabis Use: A Systematic Review

Nkporbu A.K[1*], Nkporbu N[2] and Stanley P. C[1]

[1]*Department of Neuropsychiatry, University of Port Harcourt Teaching Hospital.*
[2]*Department of Environmental Law, Faculty of Law, Rivers State University.*
[*]*Corresponding author: nakpigi2008@yahoo.com*

Article Info

Keywords: *Cannabis variants, Synthetic cannabinoids, Cannabis vaping, High-potency cannabis, Behavioural effects.*

Received: *22.11.2025;*
Accepted: *20.12.2025;*
Published: *31.12.2025*

Abstract

This research reviews evidence on new variants of cannabis use and rapid expansion and exposure of these new modes. New variants identified include edibles, delta-8 THC products, vaping, concentrates or dabbing, synthetic cannabinoids, new-edible formulations and beverages. Data were collected from already existing journals, reviews, documents that provided proper information on the research topic. Results showed a rapid increase in the use of high-potency concentrates and new inhalation techniques, and its association with behavioural changes. Delta-8 THC was discovered to be increasingly available leading to rising exposures and regulatory concerns, a persistent threat from synthetic cannabinoids and the diversification of non-inhaled cannabis products in form of beverages and nanoemulsions. Severe harm caused include high-toxicity episodes from synthetic cannabis, poison control surges with exposure to delta-8, and outbreak of lung damage similar to EVALI.

1. Introduction

The word "cannabis" refers to a variety of psychoactive forms of the plant *Cannabis sativa*. One of the earliest medical plants, *Cannabis sativa L.* has been grown for 10,000 years for a variety of industrial and agricultural uses [1]. It is a multipurpose crop plant with a wide range of agricultural and industrial uses, including the manufacturing of paper, fibre, and wood as well as possible applications in the pharmaceutical and medical sectors. The many parts, including the roots, flowers, seeds, and leaves, have been used to treat gastrointestinal disorders such nausea, vomiting, diarrhoea, and inflammatory bowel diseases (IBDs), as well as pain, inflammation, and anxiety [2]. With its primary active ingredient, tetrahydrocannabinol (THC), which binds to a G-protein-coupled receptor called the CB1 cannabinoid receptor, it has over 70 distinct cannabinoids and generates a range of central effects [3, 4]. Dopaminergic neurones, which are known to be crucial in mediating the rewarding (reinforcing) effects and abuse characteristics of marijuana, are activated by cannabinoids [5]. Therefore, cannabis and other important drugs of abuse like ethanol, nicotine, and morphine have a final similar neuronal function in that they facilitate the mesolimbic dopamine pathway [6]. Stringent legal regulations caused the plant to remain undiscovered despite its enormous potential in drug discovery until it was first legalized for medical use in California and later in many nations across the globe [1]. After legalisation, a great deal of study was conducted to examine the chemotherapeutic potential of cannabis.

Over the past ten years, there has been a significant diversification of cannabis markets and usage patterns. Users now consume high-potency cannabis products and synthetic cannabinoids (such as K2, also referred to as spice) beyond typical smoking, including concentrates, vape cartridges, edibles and delta-8-THC (Δ8-THC), which pose specific dangers due to distinct pharmacology, usage patterns, and risk profiles [7, 8]. Because of their uneven quality and erratic psychoactive effects from uncontrolled marketplaces, these goods present risks to consumer safety. Higher potency drugs also increase the danger of dependence and the possibility of acute poisoning and psychosis.

How To Cite: A.K. Nkporbu, N. Nkporbu, P.C. Stanley. Emergence of New Variants of Cannabis Use: A Systematic Review. *Current Research in Health Sciences*, 3(2):24–28, 2025. https://doi.org/10.58613/crhs324

Because of their uneven quality and erratic psychoactive effects from uncontrolled marketplaces, these goods present risks to consumer safety. Higher potency drugs also increase the danger of dependence and the possibility of acute poisoning and psychosis [9]. The risks of vaping-associated lung injury (EVALI) and inadequate regulation of THC products like delta-8, which can result in major respiratory and other health issues, are the main concerns of public health agencies like the FDA and CDC. Delta-8-THC, which is frequently poorly regulated and synthesised from CBD, offers health dangers such as toxicity from high doses and unintentional intake by youngsters, resulting in hospitalisations, according to America's Poison Centres [10]. Meanwhile, EVALI, though less prevalent due to increased awareness, remains a problem, especially with products from unverified sources [11].

2. Methodology

2.1. Search Strategy

The review used only secondary data sources which include PubMed/PMC, Google Scholar, Web of Science, Scopus, ScienceDirect and other government agency websites such as the FDA and CDC. All searches were targeted to include journals, papers, publications and reviews published from 2012 – 2025. The terms used in the search include "cannabis concentrates", "dabbing", "hash oil", "vaping cannabis", "THC cartridges", "delta-8 THC", "cannabinoids", "synthetic cannabinoids", "edibles and cannabis beverages", "new psychoactive substances", "new variants of cannabis use", and "EVALI", with every search supplemented with citation chaining of key reviews.

2.2. Inclusion / Exclusion Criteria

The screening process applied the following inclusion and exclusion criteria to ensure the quality, and relevance of materials reviewed.

The screening process included articles published between 2012 and 2025 that focused on emergence of new variants of cannabis use. Some articles were reviewed and extracted from the reference lists of selected articles. Articles with surface information, poor presentation and were not related were excluded see Table 1. Articles earlier than 2012, and written in other languages asides English language were also not included see Figure 1.

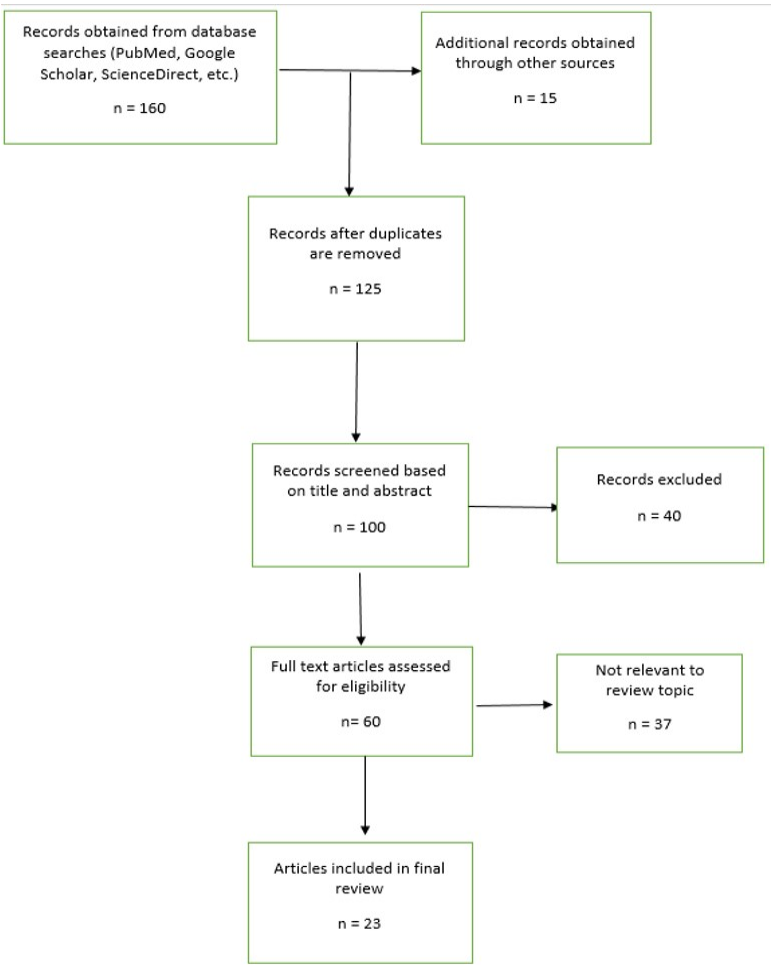

Figure 1: PRISMA Flow Diagram

Table 1: Inclusion / Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Peer-reviewed journal articles, researches , and policy documents.	Articles not focused on cannabis use or the emergence of new variants of cannabis use.
Studies addressing cannabis use, the emergence of new variants of cannabis use.	Studies with surface information on cannabis, cannabinoids and new variants of cannabis use.
Publications between 2012 and 2025	Articles published before 2012 without substantial relevance.
Publications in English Language	Publications that are not in English Language.

2.3. Key Findings

High-potency concentrates and Dabbing

High-potency cannabis concentrates, or dabs, are gaining popularity among young adults due to their high THC levels (60-90% or greater) and quick vaporisation, which increases the risk of extreme intoxication and cannabis use disorder (CUD) [12]. Use of cannabis vaping devices and dabbing rigs is connected with increased unfavourable physical and mental health outcomes, including paranoia, psychosis, and potentially deadly lung damage [13]. Bidwell et al. [7] study shows that the health implications of these products include greater tolerance and dependence risk, with more concentrated use leading to higher acute intoxication and potential mental health disorder.

Vaping and cartridge products

Vape cartridges and vape pens are now a major delivery method. Vitamin E acetate has been strongly linked with the serious harm caused in the 2019 EVALI outbreak. This brought to light the acute dangers of contaminated THC vape cartridges. Recent reviews show that the New England Journal of Medicine and the CDC found the addictive chemical in the bronchoalveolar lavage fluid of affected patients, but not in healthy individuals [14]. This substance interacts harmfully with the pulmonary surfactant in the lungs. This outbreak also revealed that when manufacturers and supply chains include hazardous adulterants, new delivery varaints might result in specific, serious consequences [15].

Delta-8 THC

The Delta-8 THC is a commercially available variant and a psychoactive isomer of delta-9 THC. It became quite popular in 2020–2022 and was marketed as legal in jurisdictions restricting delta-9 THC. This eventually led to its wide acceptance, increased public interest, product availability, and reported exposures to poison control centres [16]. Regulators such as the FDA and CDC have raised concerns about adverse events and inconsistent manufacturing of this variant [17]. Exposure to delta-8 THC has led to higher calls to poison control and emergency presentations. Manufacturing impurities or mislabelled products further enhance the risk [18].

Synthetic cannabinoids (SCs)

They are chemically diverse and continue to evolve as new variants are synthesized in order to evade regulation. Numerous SCs have been constantly connected to severe toxicity, hospitalizations and fatalities, causing more powerful and unpredictable effects. Reviews highlight SCs as a public health problem and a significant part of the larger New Psychoactive Substances (NPS) crisis [19].

Product Diversification

The legal cannabis market have diversified the packaging of products and increased the variety of available products. Examples are gummies, beverages and medicated snacks are now laced with cannabis variants. These product types have shown to modify onset or duration after intake. Regulators have frequently raised concerns about the look-alike packaging [20], and accidental exposure to children, as well as the unintentional digestion of these products by children [21]. Additionally, nanoemulsions and other formulation methods alter exposure patterns and bioavailability [22].

3. Summary of Findings

The review showed that modes of use have diversified most lately, increasing prevalence particularly in young adults. Some of these emerging variants include edibles, concentrates, vaping or cartridge use, beverage formats and delta-8 THC products. Each of these new variants tend to alter the intensity of exposure, kinetics and risk. Vaping can introduce inhaled adulterants with severe lung toxicity (EVALI) while edibles delay onset but extend its impact on the individual. However, high-potency concentrates provide substantial doses of THC immediately [7, 23].

The potential of contamination and injury is increased by regulatory gaps (especially in cases where products are marketed as loophole commodities such as delta-8) and informal supply chains. The rise in EVALI cases has been linked to contaminated cartridges and delta-8 exposures which has been reported by public health surveillance [18]. The continuous appearance of new analogues makes clinical management and surveillance complicated while synthetic cannabinoids continue to be a high-risk category with significant toxicity.

4. Conclusion

Cannabis use has seen a new variety of products like edibles and vaping, with increased acceptance and expansion. These products have been identified to change intensity after exposure, risk profiles, eventually causing lots of harm to the individual. Instances include EVALI, delta-8 exposures, severe synthetic-cannabinoid toxicity. Product testing must therefore be strengthen and manufacturing standards for concentrates, vaping products and delta-8 regulated and improved. Increased surveillance for new product-related harms should be enhanced significantly. There is also need for public education on the emergence of these new variants of cannabis use and the health implications and risks attached to the use of the informal products, and toxicity from synthetic cannabinoids.

Article Information

Disclaimer (Artificial Intelligence): The author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.), and text-to-image generators have been used during writing or editing of manuscripts.

Competing Interests: Authors have declared that no competing interests exist.

References

[1] T. Hussain, G. Jeena, T. Pitakbut, N. Vasilev, and O. Kayser. Cannabis sativa research trends, challenges, and new-age perspectives. *iScience*, 24(12):103391, 2021. doi:10.1016/j.isci.2021.103391.

[2] D. Thapa, L. N. Warne, and M. Falasca. Pharmacohistory of Cannabis Use-A New Possibility in Future Drug Development for Gastrointestinal Diseases. *International Journal of Molecular Sciences*, 24(19):14677–14677, 2023. doi:10.3390/ijms241914677.

[3] Z. Atakan, P. Morrison, M. G. Bossong, R. Martin-Santos, and J. A. Crippa. The Effect of Cannabis on Perception of Time: A Critical Review. *Current Pharmaceutical Design*, 18(32):4915–4922, 2012. doi:10.2174/138161212802884852.

[4] S. Zou and U. Kumar. Cannabinoid receptors and the endocannabinoid system: Signaling and function in the central nervous system. *International Journal of Molecular Sciences*, 19(3):833, 2018. doi:10.3390/ijms19030833.

[5] A. Muro, R. Cladellas, and J. Castellà. Cannabis and Its Different Strains. *Experimental Psychology*, 68(2):57–66, 2021. doi:10.1027/1618-3169/a000510.

[6] US Department of Health and Human Services. THE NEUROBIOLOGY OF SUBSTANCE USE, MISUSE, AND ADDICTION, 2016. URL https://www.ncbi.nlm.nih.gov/books/NBK424849/.

[7] L. C. Bidwell, R. Martin-Willett, and H. C. Karoly. Advancing the science on cannabis concentrates and behavioural health. *Drug and Alcohol Review*, 40(6):900–913, 2021. doi:10.1111/dar.13281.

[8] Almahasneh F. Ayman Alzu'bi, Ramada Khasawneh, Ejlal Abu-El-Rub, Worood Bani Baker, and R. M. Al-Zoubi. The synthetic cannabinoids menace: a review of health risks and toxicity. *European Journal of Medical Research*, 29(1), 2024. doi:10.1186/s40001-023-01443-6.

[9] R. M. Murray, A. Englund, A. Abi-Dargham, D. A. Lewis, M. Di Forti, C. Davies, M. Sherif, P. McGuire, and D. C. D'Souza. Cannabis-associated psychosis: Neural substrate and clinical impact. *Neuropharmacology*, 124:89–104, 2017. doi:10.1016/j.neuropharm.2017.06.018.

[10] America's Poison Centers. Delta-8 THC. 2024. URL https://poisoncenters.org/track/delta-8-THC.

[11] Lyracore. Vaping Lung Health: Is It Still a Concern in 2025?, 2025. URL https://www.lyracore.com/2025/08/27/vaping-lung-health-is-it-still-a-concern-in-2025/.

[12] S. Radparvar. Clinical Evaluation of the Cannabis-Using Patient: A Moving Target. *The Permanente Journal*, 28(4):77–86, 2024. doi:10.7812/tpp/24.088.

[13] N. Chadi, C. Minato, and R. Stanwick. Cannabis vaping: Understanding the health risks of a rapidly emerging trend. *Paediatrics Child Health*, 25(1):S16–S20, 2020. doi:10.1093/pch/pxaa016.

[14] C. Bates. *The outbreak of lung injuries often known as 'EVALI' was nothing to do with nicotine vaping*. Qeios, 2021. doi:10.32388/zgvhm7.3.

[15] V. P. Krishnasamy. Update: Characteristics of a Nationwide Outbreak of E-cigarette, or Vaping, Product Use–Associated Lung Injury-United States, August 2019-January 2020. *Morbidity and Mortality Weekly Report*, 69(3):90–94, 2020. doi:10.15585/mmwr.mm6903e2.

[16] S. Babalonis, W. M. Raup-Konsavage, P. D. Akpunonu, A. Balla, and K. E. Vrana. Δ8-THC: Legal Status, Widespread Availability, and Safety Concerns. *Cannabis and Cannabinoid Research*, 6(5):362–365, 2021. doi:10.1089/can.2021.0097.

[17] E. C. Leas, A. L. Nobles, Y. Shi, and E. Hendrickson. Public interest in 8-Tetrahydrocannabinol (delta-8-THC) increased in US states that restricted 9-Tetrahydrocannabinol (delta-9-THC) use. *International Journal of Drug Policy*, 101:103557, 2022. doi:10.1016/j.drugpo.2021.103557.

[18] US Food and Drug Administration. 5 Things to Know about Delta-8 Tetrahydrocannabinol-Delta-8 THC, 2024. URL https://www.fda.gov/consumers/consumer-updates/5-things-know-about-delta-8-tetrahydrocannabinol-delta-8-thc?

[19] R. Roque-Bravo, R. S. Silva, R. F. Malheiro, H. Carmo, F. Carvalho, D. D. da Silva, and J. P. Silva. Synthetic Cannabinoids: A Pharmacological and Toxicological Overview. *Annual Review of Pharmacology and Toxicology*, 63(1), 2022. doi:10.1146/annurev-pharmtox-031122-113758.

[20] C. Lee. *The Companies Selling Illegal Copycat Snacks Laced With Drugs*. TIME, 2024. URL https://time.com/6999371/delta-8-thc-fda-ftc-snacks/?

[21] H. Zwiebel, D. Greenky, and R. D. Goldman. Accidental cannabis ingestion in young children. *Canadian Family Physician*, 71(3): 161–163, 2025. doi:10.46747/cfp.7103161.

[22] Sambhakar S. Preeti, R. Malik, S. Bhatia, A. Al-Harrasi, C. Indu Rani, Kumar S. Geeta Renu Saharan, and Renu Sehrawat. Nanoemulsion: An Emerging Novel Technology for Improving the Bioavailability of Drugs. *Scientifica*, 2023(1):1–25, 2023. doi:10.1155/2023/6640103.

[23] B. C. Blount, M. P. Karwowski, P. G. Shields, M. Morel-Espinosa, L. Valentin-Blasini, M. Gardner, M. Braselton, C. R. Brosius, K. T. Caron, D. Chambers, J. Corstvet, E. Cowan, V. R. De Jesús, P. Espinosa, C. Fernandez, C. Holder, Z. Kuklenyik, J. D. Kusovschi, C. Newman, and G. B. Reis. Vitamin E Acetate in Bronchoalveolar-Lavage Fluid Associated with EVALI. *New England Journal of Medicine*, 382(8), 2019. doi:10.1056/nejmoa1916433.