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The Use of Illicit Drugs in Therapy: an Introduction

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Abstract

Purpose of Review The use of certain illicit substances as a form of therapy, and particularly as an adjunct to psychotherapy, has gained increasing media and academic attention over the last decade, culminating in what has been coined "the psychedelic renaissance." This section in *Current Addiction Reports* has been developed in order to highlight the new and emerging research around these and related substances, and how they may be effective in treating not just "problematic" substance use itself but also some of the underlying causes such as trauma-related disorders, depression, and anxiety. It will also consider the therapeutic use of other still largely illicit sub-stances such as cannabis, heroin-assisted treatment, and the prescribing of stimulants for stimulant addiction. The purpose of this review is to introduce the section "illicit drugs in therapy" and to highlight the links between the different disciplines involved in addiction research.

Recent Findings Generally speaking, research on substance use focuses on single substances and excludes underlying comorbid mental health conditions or other underlying factors. In the social sciences this link has been developing for some time (cf. *Journal of Addiction and Mental Health*). However, it is increasingly being recognized in clinical addiction science that addiction often occurs alongside other factors such as mental health conditions, trauma, and poverty, and that many people will use more than one substance, known as polysubstance use. The recent resurgence in the use of illicit substances in the treatment of addiction has sparked an interest in the addiction research field: landmark studies included two proof-of-concept studies—psilocybin-assisted therapy for smoking cessation at Johns Hopkins University and psilocybin-assisted therapy for alcohol addiction trial at the University of New Mexico.

Summary This review therefore introduces core concepts, terms, and historical development in order to highlight the emerging research in this area, and to encourage further reviews on research specific to illicit substances in therapy.

Keywords Psychedelic · Illicit drugs · Therapy · Treatment · Addiction

Introduction

The use of certain illicit substances as a form of therapy, and particularly as an adjunct to psychotherapy, has gained increasing media and academic attention over the last decade, culminating in what has been coined "the psychedelic renaissance" [1–3]. Although this term can be seen as somewhat dismissive of the cultures who have for hundreds of years been using plant medicines like psilocybin mushrooms and ayahuasca, containing the psychoactive component N, N-dimethyltryptamine or DMT [4••], the term has stuck and can be accurately applied to the rebirth of academic interest in the clinical applications of psychedelic-assisted therapy.

This section in *Current Addiction Reports* has been developed in order to highlight the new and emerging research around these and related substances, and how they may be effective in treating not just "problematic" substance use itself but also some of the underlying causes such as trauma-related disorders, depression, and anxiety. It will also consider the therapeutic use of other still largely illicit substances such as cannabis, heroin-assisted treatment, and the prescribing of stimulants for stimulant addiction.

In order to understand why certain substances have come to the attention of the wider public as potential treatment options, it is important to understand the historical use of some of these substances, not just in western medicine but in the wider human population. This introductory article will define key terms before briefly outlining some of that history, as well as linking underlying and related conditions to addiction.

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Definition of Terms

Before continuing, we feel it is necessary to briefly define what we mean when using the terms "addiction," "illicit drugs," "psychedelic," and "therapy." Firstly this section, and indeed this journal, is interested in the treatment of *addiction*—which is usually described medically as "dependence syndrome" (ICD 10) or "substance use disorder" (DSM-V). These are both clusters of symptoms including an increase in tolerance to the substance of addiction, persistent use despite evidence of harms, and the presence of withdrawal symptoms upon ceasing use. Whereas *substance use disorder* and the *dependence syndrome* concern themselves solely with drink and drugs, *addiction* as a term tends to recognize the reality that humans have problematic relationships with a much wider range of habits. We feel it is important to hold in mind that a significant number of addictions are not just substance related but include behavioral addictions such as to gambling, gaming, social media, sex, and pornography. Similarly, while there are clinically recognized terms to describe certain clusters of behaviors as addiction, in the wider drug policy community the terms are contested and often referred to as "problem drug use/users."

There is no universal definition of what constitutes "problem drug use" [5]; however institutions and countries have tended to define it as harms stemming from injecting drug use. For example, The UN Office of Drugs and Crime (UNDOC) state that, "While there is no established definition of problem drug users, they are usually defined by countries as those that regularly use illicit substances and can be considered dependent, and those who inject drugs" [6]. The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) defines it as "Injecting drug use or long duration/regular use of opioids, cocaine and or amphetamines" [7]. The Scottish Government develop this definition a bit further to define "problem drug users" as "a category of people who will be experiencing or causing social, psychological, physical, medical or legal problems because of their drug use. They are likely to be in touch with drug treatment services, although many will not" [8]. The term "problematic substance use" will therefore be used interchangeably with the term "drug use disorders" to encompass substance use that does not fall into a diagnostic category.

Psychedelics have traditionally been defined as drugs that cause a range of profound psychological effects including perceptual changes, shifts in mood, psychological insights, and mystical experiences. "Classic psychedelics" are compounds that are active at the serotonin receptor (5HT2a) and include psilocybin from the "magic" mushroom, ayahuasca, and its psychoactive ingredients DMT, LSD, and mescaline. In recent years the field of *psychedelics* has expanded to include related substances like ketamine and 3,4-methylenedioxy methamphetamine (MDMA) in an attempt to incorporate these drugs in the therapeutic setting.

The term *illicit drugs* covers all psychoactive substances, whether legally or illegally produced, that are used out with a legal medical framework. The term is not all encompassing, however, as some drugs straddle both a legal framework (such as ayahuasca, which is legal to use in certain South American countries and even under religious access by some churches in the USA) and an illegal framework (such as heroin—primarily illegal, and its precursor, morphine—legal and widely used as a medicine). Furthermore, as an increasing number of "illicit" drugs move into the medical arena, the boundary between illicit and licit becomes even more blurred. For the purposes of this section the term *illicit* covers all drugs that have both a medical and adult use potential, whether they are used in a legal or illegal setting. Much of the recent research has focused on psychedelics; however, this section will also include several non-psychedelic drugs that have a significant illicit usage, such as stimulants, heroin, and cannabis.

The use of illicit substances in both a *therapeutic* and *treatment* setting is another area that needs to be clarified. Traditionally the term therapy has been used to imply a medical intervention in order to help a patient recover from a medical diagnosis. This covers both physical therapy (for example, physiotherapy to help rebuild strength following an injury) and talking therapy (for example, cognitive behavior treatment for certain diagnosed mental health conditions). However, when used in conjunction with psychedelics (as defined above), the term therapy has come to mean something more encompassing, taking into account sacred and ritual aspects of the therapeutic journey, and the therapy itself taking place in a range of settings using a range of modalities. Similarly, the term "treatment" has several uses. Within the drug addictions, discipline *treatment* is a term used to describe a variety of interventions such as the prescribing of a medication aimed at reducing substance use, residential rehabilitation, and talking therapy. This section of *Current Addiction Reports* will include research from across the range of disciplines where drugs associated largely with illicit use are being researched and developed as treatments (see Table 1).

Brief History of Medical Use

Historical Use

The use of psychoactive substances intended as medicines can be traced as far back as the ancient Sumerians [9, 10, 9, 11], and opium was commonly known as "the plant of joy" and used across the eastern and middle eastern continents [10•].

Table 1 Various uses of "illicit drugs in therapy" for addiction (authors design)

Role of drug being prescribed	*As replacement/substitute prescribing*	*As an adjunct to psychotherapy*	*As treatment of comorbid mental illness*
Examples of drug:	Heroin-assisted treatment, diazepam prescribing in benzodiazepine addiction, stimulants for cocaine addiction	Psilocybin-assisted therapy for alcohol addiction, MDMA-assisted therapy for PTSD	Stimulants for ADHD, cannabis for comorbid anxiety or sleep disorder
Intended outcomes of intervention	Reduction of harm from illicit use; stability in drug use	Treatment of the addiction itself; treatment of underlying cause (e.g. PTSD)	Improvement in mental health through treating comorbid and contributory mental illness; people may "self-medicate" with non-prescribed substances
Role of psychotherapeutic/psychosocial interventions	Psychosocial support is key; formal psychotherapy rarely forms a central part of the intervention	Psychotherapy is an integral part of the treatment; usually requires a level of stability and support to be able to engage	Psychotherapy may be a part of the treatment plan

More recent archeochemical findings suggest that some cultures in modern day Turkey and Israel were using "spiked beer" as part of their ritual celebrations as far back as 11,000 years 13), and opium seeds have been found in ritual vessels as far back as 5000 years [9•]. Indeed, it has been suggested by a range of scholars that cannabis and psychedelic use was instrumental in the origins of the Christian Church, in particular, its healing properties and use in ancestor worship [9, 13].

The use of herbal psychoactive substances for healing in western medical settings can be traced back to the fourteenth century with the use of opium and cannabis for a range of maladies [10, 12]. Colonialism brought these medicines to the "west" predominantly through trading, such as the East India Trading Company [10•], but also through customs and culture. Cannabis and opium had been used in eastern countries as medicines for centuries, and western physicians took up their use eagerly [10, 11]. During the nineteenth century, opium and cannabis were used as both a medicine and an enjoyable recreation, with cocaine being introduced in the early twentieth century. However, a complex mix of increasing urban populations, changing class structures, and greater awareness in the medical community of potential harms resulted in the beginning of drug regulation as we know it today [10, 14].

Morphine (from Morpheus, the god of sleep) was first derived from opium as a safer and less addictive drug in the early nineteenth century [12]. The creation of morphine, and the development of the hypodermic needle increased its medical use, but also its addiction potential due to the fast acting route of administration. Morphine became a routine drug used in medical settings which continues to this day. Similarly cannabis tincture was routinely prescribed and used for a range of conditions including pain, and this lasted up until the 1970s when the international drug framework was finally created, and cannabis excluded as a drug of medicine due to the stigma and "war on drugs" [10•]. Cocaine on the other hand was used as a stimulant and initially used in drinks such as Coca Cola © and "Vin Mariani" to increase energy. Images can be found online showing toothache cocaine pills for children, and it was, and in some countries still is, used as an anesthetic during surgery. However, it developed a reputation as a recreational drug, and its use was significantly reduced once the drug regulatory framework developed.

During the early to mid-twentieth century, there was a continuous tug of war between different nation states on how to regulate these psychoactive substances, with the USA spearheading the push for full criminalization of all substances, and the UK preferring to view drug addiction as a health problem and thereby resisting calls for complete prohibition. This resulted in what became known as the "British System," a harm reduction approach whereby heroin addicts

were prescribed heroin, and some cocaine addicts were prescribed cocaine. The system fought valiantly on for some years, even after prohibition, eventually folding under pressure from the USA, who continued to view heroin addiction as a criminal justice matter [11, 15, 16

Early Psychedelic Research

The first wave of clinical interest in the therapeutic potential of psychedelic drugs was kickstarted with the serendipitous discovery of lysergic acid diethylamide—LSD-25—by the Swiss chemist Albert Hoffman, who was working at the time for Sandoz Pharmaceuticals trying to find a treatment for post-natal bleeding. Hoffman unintentionally dosed himself with a tiny amount of the chemical—causing him to feel "*a not unpleasant intoxicated-like condition, characterised by an extremely stimulated imagination*"(17). He decided the experience was worthy of further exploration and on April 19, 1943, took the world's first ever intentional acid trip. Hoffman felt that psychiatrists and psychologists would benefit from this experience and Sandoz soon made LSD freely available to any facility looking to research its psychological properties. Initially, drugs such as LSD and mescaline (the psychoactive component in the peyote and San Pedro cacti) were thought to be *psychotomimetic* in nature, i.e., triggering a temporary experience similar to psychosis, and as such were used as a way of educating mental health professionals as to what some of their more unwell patients were experiencing. It soon became clear, however, that this did not accurately explain their full range of effects. The term *psychedelic* (from psych = mind, and delos = to manifest, to reveal) was coined in 1957 by the British psychiatrist Humphry Osmond who had moved to Canada in order to try and treat alcohol addiction with LSD [18].

Psilocybin, the active component of "magic mushrooms" followed closely behind LSD when the American banker and amateur mycologist R. Gordon Wasson traveled to Oaxaca, Mexico, in 1957 to take part in a mushroom ceremony. The local medicine woman, or *curandera*, who led the ceremony, Maria Sabina, agreed to take the westerners into her home and ceremonial space on the condition that Wasson would not publish accounts or pictures of the ceremony. He subsequently did both, publishing his full trip report with pictures in *Life* magazine [19], triggering huge interest in the power of the magic mushroom, with thousands of westerners flocking to Sabina's village to try and gain access to these powerful mushrooms bringing disastrous consequences for both Sabina and the village. These actions, and others like them, echo today in the discussions around psychedelic colonialism [20], psychedelic capitalism [21], and indigenous inclusion and reciprocity [22••].

Over the 1950s and 1960s, LSD was the most widely researched drug in mental health with many thousands of doses being given to thousands of patients for a range of diagnoses and difficulties [23, 23]. LSD was influential in the discovery of serotonin and the development of the neurochemical model of mental processes [24, 25]. In what would become a familiar pattern, evidence of the relative safety of these drugs was not enough to stop them from being banned. As LSD leaked out of the therapy offices and into mass public use, the psychedelic movement became less about clinical research and more associated with a generation of young people who would rather attend music festivals than fight in Vietnam. Governmental opposition to psychedelics, and in particular LSD, grew. Media scare stories were common [26], often bizarre (27), and ultimately successful in helping a hostile US government stoke public fear, paving the way for their widespread banning—and the end of a hugely promising area of mental health and addiction research.

The Rebirth of Psychedelic Research

As with other periods of prohibition, the rescheduling of drugs like LSD, psilocybin, and later MDMA did not curtail their usage. What the ban did achieve, however, was the near total shutdown of psychedelic research, apart from a few labs in Europe and the Soviet Union.

Unnoticed behind the Iron Curtain, undeterred by the west's war on drugs, research into the use of ketamine continued with studies conducted looking at ketamine psychedelic therapy (KPT) for heroin and alcohol addiction [28]. The research of Krupitsky and his team has been important in shaping the way for more recent work looking at ketamine therapy for addiction [29, 30

In the west, the major psychedelic breakthrough came in 2000 when Rick Strassman was given US Federal Government approval to research DMT in healthy volunteers with previous experience. A trickle of studies in healthy volunteers [31, 32] led to encouraging results when used in small numbers of patients for PTSD [33, 34], depression [35], and end of life distress [36]. Positive media hype followed, with the Multidisciplinary Association for Psychedelic Studies (MAPS) spearheading the research of MDMA-assisted therapy for PTSD, and institutions like the Psychedelic Research Group at Imperial College London navigating the pitfalls and hurdles involved with researching psychedelics to study their effect on the brain and on depression. Today, psychedelics constitute a multi-million dollar industry. Legal private ketamine clinics are beginning to pop up in both the USA and the UK, while there is a growing psychedelic tourism industry involving legal or decriminalized areas of the world like Jamaica, Mexico, South America, and some parts of Europe.

Illicit Drugs in the Treatment of Drug Addiction

> *"I am certain that the LSD experience has helped me very much. I find myself with a heightened color perception and an appreciation of beauty almost destroyed by my years of depression…The sensation that the partition between 'here' and 'there' has become very thin is constantly with me."*

– Bill Willson, Founder of Alcoholics Anonymous [37]

It has been long known in the addictions field that classic psychedelics can be potentially transformative as a treatment. Bill Wilson, founder of Alcoholics Anonymous, experimented with LSD in treating his own alcohol addiction and even advocated for its inclusion as a step in the AA process [38]. British psychiatrist Humphry Osmond used it extensively in treating alcohol addiction in rural Canada, and a 2012 meta-analysis looking back at this period of 1960s and 1970s research concluded:

> *"Given the evidence for a beneficial effect of LSD on alcoholism, it is puzzling why this treatment approach has been largely overlooked."* [39]

As interest in psychedelic research slowly ramped back up from the mid-2000s onward, and psychedelic research centers began opening up across the USA and Europe, attention turned once again to the potential of psychedelic-assisted therapy as a treatment for addiction. Psilocybin was the substance researched—in part because of its shorter duration than LSD, but also because it comes with less of the political baggage than LSD and its associations with the countercultural, anti-war movement.

Landmark studies included two proof-of-concept studies—psilocybin-assisted therapy for smoking cessation at Johns Hopkins University [40] and psilocybin-assisted therapy for alcohol addiction trial at the University of New Mexico [41]. It is interesting to note that so far, the most indicative measure of positive outcome in these addiction trials is the mystical experience, harking back to the early days of Humphry Osmond trying to use LSD to induce spiritual revelations with his patients with alcohol use problems. Indeed Carl Jung, himself directly if inadvertently involved in the very formation of Alcoholics Anonymous, spoke of the importance of the religious or spiritual experience in helping those lost souls addicted to alcohol, for whom all other options had failed:

> *"You see, 'alcohol' in Latin is* spiritus*, and you use the same word for the highest religious experience as well as for the most depraving poison. The helpful formula therefore is:* spiritus contra spiritum*"*

– C.J Jung, 1961[42]

Psychedelics in addiction have come full circle now, with members of the recovery community [43] as well as leading academics [44••] laying out frameworks for Twelve Step Fellowships to incorporate psychedelic use into their community-based treatment.

The Link Between Addiction and Illicit Drugs in Therapy

Generally speaking, research on substance use focuses on single substances and excludes underlying comorbid mental health conditions or other underlying factors. In the social sciences this link has been developing for some time (cf. *Journal of Addiction and Mental Health*). However, it is increasingly being recognized in clinical addiction science that addiction often occurs alongside other factors such as mental health conditions [45], trauma [46], and poverty [47•], and that many people will use more than one substance, known as polysubstance use [48].

Mental health, in particular, is a key factor in understanding and treating addiction. The Global Burden of Disease, a collaborative study carried out by the Institute for Health Metrics and Evaluation [49], found that substance use combined with mental health conditions is the leading cause of "years living with a disability" [49]. Their findings have been used in subsequent World Health Organization reports [50] and other international responses to the "drug problem," but there has not been such a large-scale study of the correlation since. Within individual countries and local authorities, there is beginning to be a recognized link between these two disorders, with organizations now producing toolkits for dual diagnosis in mental health settings [51]. The World Drug Report 2022 highlights that there are approximately 36 million people worldwide living with a drug use disorder, often occurring alongside a mental health condition, in addition to contributing factors, as discussed below [44••]. The link between mental health conditions and addiction is still in development, but dual diagnosis (diagnosis of both an mental health condition and a drug use disorder) is being recognized as a way of addressing the complex treatment needs of people with drug use disorders [52].

The correlation between trauma, mental health conditions, and addiction is another area that is increasingly being explored. Research has shown that trauma can be a major risk factor for drug use disorders [46, 53, 54]. The use of the adverse childhood experiences model (ACEs), initially designed to examine the link between traumatic childhood experiences and health conditions such as heart disease (cf. CDC 2022), has found that ACEs are a contributing factor

to drug use disorders [54], to the point that countries such as Scotland have enshrined the reduction of ACEs in their national strategy [55].

Poverty is another contributing factor in addiction. The role of economic policies in creating the conditions for "problematic" substance use is supported by a large body of research [50, 56–58]. In the 1980s these policies resulted in the deindustrialization of most western countries, with large swathes of the population losing their jobs, their communities, and their sense of selves [58]. In developing countries economic and systemic poverty are contributing factors to both mental health conditions and addiction [50]. The World Drug Report 2022 highlights that most harms resulting from drug use disorders are in developing countries, where poverty resulting from the lack of economic opportunities and adequate health care alongside trauma creates the conditions for addiction [59]. It is clear that where there is poverty, there will be addiction.

This section will therefore have reviews on how illicit drugs in therapy may address the complex interplay between poverty, trauma, mental health, culture, and addiction, in the recognition that these conditions may result in, or be the result of, "problematic substance use."

Conclusion

This introduction to the new *Current Addiction Reports* section "Illicit Drugs in Therapy" has attempted to define some of the relevant terms, before considering the history of the medicinal use of substances that are widely viewed as illicit in large parts of the world today—both within indigenous populations and in the context of western, clinical research. It sets the overarching theme of this section which is to introduce addiction scholars and clinicians to the wave of research taking place around the use of psychoactive substances in treating addiction. As shown there is a strong correlation between external conditions such as poverty and trauma, and the internal experience of addiction and as such articles in this section will not always directly speak to substance dependence, but may approach the topic holistically, in the understanding that addiction and drug dependence are symptoms (whether biological or not) of a broader socio-economic and cultural disease in our modern industrial based society. The topic of *Illicit Drugs in Therapy* necessarily involves people from a wide range of fields, including but by no means limited to psychiatrists, psychologists, harm reduction workers, people in recovery, people in active substance use, anthropologists, lawyers, and shamans. We hope to include a variety of voices from the relevant disciplines in this new section, as the addiction treatment world continues to look at alternative therapies for the rising tide.

Declarations

The Section Editors for the topical collection Illicit Drugs are Anna Ross and Jake Hawthorn. Please note that neither Section Editor was involved in the editorial process of this article as they are co-authors.

Conflict of Interest The authors declare no competing interests.

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References

Papers of particular interest, published recently, have been highlighted as:
- • Of importance
- •• Of major importance

1. Sessa B. The 21st century psychedelic renaissance: heroic steps forward on the back of an elephant. Psychopharmacology. 2017;235(2):551–60. https://doi.org/10.1007/s00213-017-4713-7.
2. • George D HR, Wilkinson D, Garcia-Romeu A. Ancient roots of today's emerging renaissance in psychedelic medicine. culture, medicine, and psychiatry. 2021;1–14. https://doi.org/10.1007/s11013-021-09749-y. **A comprehensive discussion on the ancient roots of psychedelic drug use.**
3. Noakes J. Psychedelic renaissance: could MDMA help with PTSD, depression and anxiety? The Guardian. 2019. [internet] Available at: https://www.theguardian.com/science/2019/apr/14/psychedelic-renaissance-could-mdma-help-with-ptsd-depression-and-anxiety.
4. •• Williams K RO, Braunstein M, Brant S. Indigenous Philosophies and the "psychedelic renaissance". Anthropol Conscious. 2022;1–22. https://doi.org/10.1111/anoc.12161. **Addresses the colonial extractivism present in current psychedelic research and use, and discusses how indiginous use can offer alertnative, non medicalised, approach to psychedelic assisted therapy.**
5. Chatwin C. Towards More Effective Global Drug Policies. Palgrave. 2018. Available URL: https://link-springer-com.ezproxy.is.ed.ac.uk/book/10.1007%2F978-3-319-92072-6.
6. World Drug Report. Available at: World Drug Report 2011. 2011. unodc.org.
7. European Drug Report. Trends and developments. Available at: European Drug Report 2017: Trends and Developments. 2017. https://www.emcdda.europa.eu.
8. Scottish Government. The road to recovery: a new approach to tackling Scotland's drug problem. 2008b. Available at: https://www.gov.scot/publications/road-recovery-newapproach-tackling-scotlands-drug-problem/.
9. • Muraresku BC. The Immortality Key: The secret history of the religion with no name: St. Martins Press; 2020.**The most**

comprehensive body of research linking early Christian and Catholic religions to the use of psychedelic induced ritual and spiritual insite.

10.• Shapiro H. Fierce chemistry: a history of the UK drug wars: Amberley Books; 2021.**The most comprehensive investigation into the history of UK drugs policy currently available.**

11. Nutt D. Drugs without the hot air: making sense of legal and illegal drugs: UIT Cambridge Ltd.; 2020.

12. Samorini G. The oldest archeological data evidencing the relationship of *Homo sapiens* with psychiactive plants: a worldwide overview. J Psychedelic Stud. 2019;2(2):63–80. https://doi.org/10.1556/2054.2019.008.

13. Devereux P. The long trip: a prehistory of psychedelia: Daily Grail Publishing. 2008.

14. Devereux P. The long trip: a prehistory of psychedelia: Daily Grail Publishing. 2008.

15. Strang J, Sheridan J. Heroin prescribing in the "British System" of the mid 1990's: data from the 1995 national survey of community pharmacies in England and Wales. Drug Alcohol Rev. 1997;16(1):1–7. https://doi.org/10.1080/09595239700186281.

16.• Seddon T. Prescribing heroin: John Marks, the Merseyside clinics, and lessons from history. Int J Drug Policy. 2020;78:102730. https://doi.org/10.1016/j.drugpo.2020.102730.**Very important publication setting out the history and application of heroin assisted treatment in the UK. Provides insights into how HAT can and should be carried out.**

17. Hoffman A. My problem child: Oxford University Press. 1980.

18. BMJ. Humphrey Osmand Obituary. 2004. Available at: https://www.bmj.com/content/328/7441/713?hwshib2=authn%3A1662024231%3A20220831%253Ac20edbd3-4e7d-42dc-8a62-c5c85cc8b1f9%3A0%3A0%3A0%3A3D5k5B8ngsg9DTCZZ4TGOg%3D%3D.

19. Wasson G. Seeking the magic mushroom. [internet] Available at: https://www.cuttersguide.com/pdf/Periodical-Publications/life-by-time-inc-published-may-13-1957.pdf1957.

20. Fotiou E. The role of indiginous knowledges in psychedelic science. J Psychedelic Stud. 2020;4(1):16–23. https://doi.org/10.1556/2054.2019.031.

21. Biener A. Rebel Wisdom [Internet]. Available at: https://medium.com/rebel-wisdom/the-psychedelic-trojan-horse-14c9704efd42021.

22.•• George JR, Michaels TI, Sevelius J, Williams MT. The psychedelic renaissance and the limitations of a white-dominant medical framework: a call for indiginous and ethnic minority inclusion. J Psychedelic Stud. 2019;4(1):4–15. https://doi.org/10.1556/2054.2019.015. **Contribution to the discussion on decolonising the pychedelic space, with specific focus on how to include a wider range of voices in the development of treatment.**

23. Malleson N. Acute adverse reactions to LSD in clinical and experimental use in the United Kingdom. Br J Psychiatry. 1971;118:229–30. https://doi.org/10.1192/bjp.118.543.229.

24. Nicholls D. Seretonin, and the past and future of LSD. Online. 2013.

25. Cozzi N. Psychedelic breakthroughs in neuroscience: how psychedelic drugs influenced the growth and development of psychopharmacology. Online: MAPS. 2013. https://doi.org/10.1038/s41583-020-0367-2.

26. Lee M, Shlain B. Acid dreams. New York: Grove Press; 2000.

27. Siff S. Acid Hype: American news media and the psychedelic experience. University of Illinois Press. 2015.

28. Krupitsky EGA. Ketamine psychedelic therapy (KPT): a review of the results of ten years of research. J Psychoactive Drugs. 1997;29(2):165–83. https://doi.org/10.1080/02791072.1997.10400185.

29. Walsh Z, Mollaahmetoglu, OM, Rootman J, Golsof S, Keeler J, March B, Nutt D, Morgans C. Ketamine for the treatment of mental health and substance use disporders: a comprehensive systematic review BJPsych Open. 2021;8(1). https://doi.org/10.1192/bjo.2021.1061.

30.•• Mathai DS, Mora V, Garcia-Romue A. Towards synergies of ketamine and psychotherapy. Hypothsis Theory. 2022. https://doi.org/10.3389/fpsyg.2022.868103. **Brings together much of the learning around ketamine assisted therapy and suggests ways in which to implement best practice.**

31. Strassman RJ, Qualls, Clifford R. Dose-response study on N, N-dimethyltryptamine in humans: I. Nerodocrine, atonomic, and cardiovascular effects. Gen Psychiatry 1994;51(2):85–97. https://doi.org/10.1001/archpsyc.1994.03950020009001.

32. Griffiths RR, Richards WA, McCann U, Jesse R. Psilocybin can occasion mystical-type experiences having substantial and sustained personal meaning and spiritual significance. Psychopharmacology. 2006;187:268–83. https://doi.org/10.1007/s00213-006-0457-5.

33. Mithoefer MWM, Mithoefer A, Jerome L, Doblin R. The safety and efficacy of ±3,4-methylenedioxymethamphetamine-assisted psychotherapy in subjects with chronic, treatment-resistant post-traumatic stress disorder: the first randomized controlled pilot study. J Psychopharmacol. 2010;25(4):439–52. https://doi.org/10.1177/2F0269881110378371.

34. Mithoefer MWM, Mithoefer A, Jerome L, Martin S, Yazar-Klosinski B, et al. Durability of improvement in post-traumatic stress disorder symptoms and absence of harmful effects or drug dependency after 3,4-methylenedioxymethamphetamine-assisted psychotherapy: a prospective long-term follow-up study. J Psychopharmacol. 2013;27(1):28–39. https://doi.org/10.1177/2F0269881112456611.

35. Robin L, Carhart-Harris MB, James Rucker*, Camilla MJ Day*, David Erritzoe, Mendel Kaelen, Michael Bloomfi eld, James A Rickard, Ben Forbes, Amanda Feilding, David Taylor, Steve Pilling, Valerie H Curran, David J Nutt. Psilocybin with psychological support for treatment-resistant depression: an open-label feasibility study. Lancet Psychiatry. 2016;3:619–27. https://doi.org/10.1016/S2215-0366(16)30065-7.

36. Ross TS, Bossis A, Guss J, Agin-Liebes G, Malone T, Cohen B, Mennenga S, Belser A, Kalliontzi K, Babb J, Su Z, Corby P, Schmidt BL. Rapid and sustained symptom reduction following psilocybin treatment for anxiety and depression in patients with life-threatening cancer: a randomized controlled trial. J Psychopharmacol. 2016;30(12):1165–80. https://doi.org/10.1177/0269881116675512.

37. Wilson LDB. Distilled spirits: Chapter 7 *Psychedelic*: University of California Press; 2012.

38. Lattin D. Bill Wilson. LSD and the secret psychedelic history of alcoholics anonymous - Lucid News [internet]. Available at: https://www.lucid.news/bill-wilson-lsd-and-the-secret-psychedelic-history-of-alcoholics-anonymous/?fbclid=IwAR02TDZbC-42yfKp927e_vAT-OzYvf3LEScgMRefeOWBQznryIEtLSY0yyqY.2022.

39. Krebs TS, Johansen PO. Lysergic acid diethylamide (LSD) for alcoholism: meta-analysis of randomized controlled trials. J Psychopharmacol. 2012;26(7):994–1002. https://doi.org/10.1177/0269881112439253.

40. Johnson M, Carcia-Romeu A, Griffiths R. Long-term follow-up of psilocybin-facilitated smoking cessation: abstinence outcomes and qualitative analysis of participant acounts. Am J Drug Alcohol Abuse. 2015;43(1):55–60. https://doi.org/10.3109/00952990.2016.1170135.

41. Bogenschutz MP, Forcehimes AA, Pomm JA, WilcoxC E, Barbosa PCR, Strassman RJ. Psilocybin-assisted treatment

for alcohol dependence: a proof-of-concept study. J Psychopharmacol. 2015;29(3):289–99. https://doi.org/10.1177/0269881114565144.

42. Wilson B. AA Grape Vine [Internet]: Speaking of Jung: interviews with Jungian Analysts. 1963. [internet]. Available from: https://speakingofjung.com/blog/2015/11/13/the-bill-w-carl-jung-letters.

43. Available from: https://www.psychedelicsinrecovery.org.

44.•• Yaden DB, Berghella AP, Regier PS, Garcia-Roneu A, Johnson MW, Hendricks PS. Classic psychedelics in the treatment of substance use disorder: potential synergies with twelve-step programs. International Journal of Drug Policy. 2021;98. https://doi.org/10.1016/j.drugpo.2021.103380. **Important study that seeks to bring psychedelic assisted therapy to recovery communities by highlighting the synergies betweeen the 12 step process and psychedelic assisted therapy.**

45. Kessler RCCR, Warner LA, Nelson CB, Schulenberg J, Anthony JC. Lifetime co-occurrence of DSM-III-R alcohol abuse and dependence with other psychiatric disorders in the National Comorbidity Survey. Arch Gen Psychiatry. 1997;54(4):313–21. https://doi.org/10.1001/archpsyc.1997.01830160031005.

46. Somer E. Trauma, dissociation, and opiate use disorder. Curr Addict Rep. 2019;6(1):15–20. https://doi.org/10.1007/s40429-019-0236-0.

47.• Manhica H, Straatmann VS, Lundin A, Agardh E, Danielsson A-K. Association between poverty exposure during childhood and adolescence, and drug use disorders and drug-related crimes later in life. Addiction. 2021;116:1747–56. **Very important publication linking poverty and ACE's to problem substance use in later life.**

48. United Nations Office on Drugs and Crime. World Drug Report; Booklet 2. 2022. [internet] Available at: https://www.unodc.org/unodc/data-and-analysis/world-drug-report-2022.html.

49. IHME. Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010 [internet] Availabloe at: https://www.healthdata.org/research-article/global-burden-disease-attributable-mental-and-substance-use-disorders-findings 2010.

50. WHO. World Mental Health: Transforming mental health for all. 2022. [internet] Available at: https://www.who.int/publications/i/item/9789240049338.

51. Turning Point. Dual diagnosis: good practice handbook. 2017. [internet]. Available at: https://www.turning-point.co.uk/_cache_ec53/content/dualdiagnosisgoodpracticehandbook-5090910000025794.pdf.

52. Bradizza CM, Stasiewicz PR, Dermen KH. Behavioral interventions for individuals dually diagnosed with a severe mental illness and a substance use disorder. Curr Addict Rep. 2014;1:243–50. https://doi.org/10.1007/s40429-014-0032-9.

53. Mate G. In the realm of hungry ghosts: close encounters with addiction: Vermillion; 2008.

54. McKenzie LT, Reed M. The effect of adverse childhood experience on clinical diagnosis of a substance use disorder: results of a nationally representative study. Subs Use Misuse. 2017;52(6):689–97. https://doi.org/10.1080/10826084.2016.1253746.

55. Scottish Government. Rights, respect and recovery: alchohol and drug treatment strategy. 2018.[internet] Available at: https://www.gov.scot/publications/rights-respect-recovery/.

56. MacGregor S. The Politics of drugs: perceptions, power and politics: Palgrave MacMillan. 2017.

57. Scott-Samuel A, Bambra C, Collins C, Hunter DJ, McCartney G, Smith K. The impact of Thatcherism on health and well-being in Britain. Int J Health Serv. 2014;44(1):53–71. https://doi.org/10.2190/HS.44.1.d.

58. Minton J, Shaw R, Green MA, Vanderbloemen L, Popham F, McCartney G. Visualising and quantifying 'excess deaths' in Scotland compared with the rest of the UK and the rest of Western Europe. Epidemiol Commun Health. 2017;71:461–7. https://doi.org/10.1136/jech-2016-207379.

59. United Nations Office on Drugs and Crime. World Drug Report. Booklet 1. 2022. [internet] Available at: https://www.unodc.org/unodc/data-and-analysis/world-drug-report-2022.html.

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