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# Efficacy of Psilocybin in the Treatment of Substance and Alcohol Use Disorders

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## Introduction

Substance use disorder (SUD) and Alcohol use disorder (AUD) are major public health crises, affecting 46.3 million and 29.5 million Americans respectively. Currently, the only treatment options for SUD and AUD are behavioral therapies and medications (e.g., disulfiram, acamprosate, naltrexone). Psilocybin is a serotonin analog, derived from the psilocybe mushroom that has been shown to increase neuroplasticity, GLU synapses in the hippocampus, and dendritic spine density in the PFC. Self-reporting studies have shown microdosing psilocybin has alleviated symptoms of depression, anxiety, and SUD. In this review, we explored psilocybin's efficacy in treating SUD and AUD, as compared to traditional treatment modalities.

## Methods: Inclusion and Exclusion Criteria

Inclusion criteria:

- Indexed
- Peer-reviewed
- Primary sources
- Reviews
- Published ≤ 10 years ago
- Treatment for mental health disorders, SUD, and/or AUD
- Other psychedelics

Exclusion criteria:

- Non-peer reviewed articles
- Not relevant to the thesis/question
- Studies not written in English or without English translation available

## Results

The psychodynamic antidepressant effects of psilocybin, specifically its action on the serotonin receptor 5-HT<sub>2A</sub>, gene expression, and its impact on crucial brain regions involved in depression, mark its potential in future drug development for depression and other mental health disorders. Clinical trials investigating the efficacy of psilocybin as a complement to psychotherapy for AUD reported notable reductions to participants' heavy drinking days, and an overall decrease in alcohol consumption compared to the control groups. Similarly, results from other trials concluded that participants reported improvement of depressive symptoms at follow up evaluations with no major adverse effects. Additionally, findings from a 6-week trial comparing psilocybin therapy with escitalopram, a commonly prescribed SSRI, yielded no significant differences upon measuring participants' personality domains. Furthermore, participants suffering from aforementioned mental health disorders who experimented with microdosing reported beneficial effects, such as improved focus, confidence, and relationships alongside decreased social anxiety. Animal models proved that psilocybin disrupted alcohol-related memories and alcohol-seeking behaviors, concluding that psilocybin therapy may be beneficial in preventing relapse for patients with AUD.

## Methods: Search Strategy

- Databases searched:
  - PubMed
  - Embase
  - Scopus
  - Web of Science
  - Google Scholar
  - Ovid
- Key terms:
  - "Psilocybin"
  - "Psychedelics"
  - "Substance use disorder treatment"

Database	Search String	# of Results	Search Period
PubMed	"substance abuse" AND "psychedelics"	607	2013-2023
Embase	"Substance abuse Disorder" AND "Psilocybin"	105	2013-2023
Scopus	"Psilocybin" AND "alcohol"	113	2013-2023
Web of Science	"substance abuse" AND "psilocybin" AND "treatment"	13	2018-2023
Google Scholar	"Psilocybin" AND "substance use disorder" AND "trials" AND "treatments"	576	2019-2023
Ovid	"Psilocybin" AND "mental Health"	146	2018-2023

## Discussion

Current studies show that psilocybin has potential as a treatment for SUD and AUD. Studies on psilocybin have various limitations, such as small sample sizes, reliance on self-reported data, and the inability to fully replicate the psychedelic experience in animal models. Despite limitations, these findings provide a strong rationale for conducting future high-quality research.

