



Background:

- Mindfulness meditation and related interventions have demonstrated therapeutic potential for addiction¹, anxiety², stress³ and depression² and enhancements in well-being^{4,5}
- Psychedelics have been successfully applied to addiction⁶, depression^{7,8}, anxiety⁶, eating disorders⁹ and give rise to lasting benefits in healthy population^{10,11}
- Due to their common effects and various shared therapeutic mechanisms, these two interventions have been suggested to induce complementary effects if combined¹².



Evidence for synergistic Effects

Study	Substance	Sample (size)	Study design	Findings
Griffiths et al. (2018)	Psilocybin	Healthy sample (n=75)	2 sessions (or active control) combined with moderate/high intensity 6-month programme of spiritual practices; DB, R, PC, WS+BS	<ul style="list-style-type: none"> • ↑mood, well-being + life satisfaction > control group • ↑Life meaning, ↑Trait forgiveness, ↑Spirituality, ↑Daily transcendental experience, ↑Positive Attitudes about Oneself ↑Interpersonal closeness and ↑Gratitude 4 months after last psilocybin session for experimental group, compared to baseline • Engagement in Daily Meditation, ↑Meditation Duration, ↑Frequency of Spiritual Awareness Practice, ↑Engagement in Daily Spiritual Practice & ↑Frequency of Journal Writing 4 months after last psilocybin session for experimental group, compared to baseline • →Unprecedented trait changes produced: failed to be demonstrated after psilocybin without mindfulness^{13,14,15}
Smigielski et al. (2019a)	Psilocybin	Healthy sample of experienced mind-fulness meditators (n=25)	Single session during 5-day Zen meditation retreat; DB, R, PC, WS + BS	<ul style="list-style-type: none"> • ↑Appreciation for life, ↑Self-Acceptance, ↑Quest for meaning, ↓Fear of Death, + ↑Trait Mindfulness 4 months after retreat > control group • ↑Meditation Depth on the day of administration • →Unprecedented trait changes produced: failed to be demonstrated after psilocybin without mindfulness^{13,14,15}
Dakwar et al. (2019)	Ketamine	Clinical sample at risk of cocaine addiction (n=55)	I.V. Ketamine administered once during 5-week MBRP programme	<ul style="list-style-type: none"> • x5 abstinence rates for experimental group, x7.8 less likely to relapse than control • 44% abstinence maintained at 6-month follow-up vs. 0% for control group →Extended ketamine's anti-addictive effects, which had only been reported transiently^{16,17}

DB: Double-blind; R: Randomized; PC: Placebo-Controlled; WS: Within-Subject comparison; BS: Between-Subject comparison

Conclusions:

- These studies provide promising evidence for complementary effects between mindfulness meditation and psychedelic administration
- Evidence is preliminary and requires replication
- Depression could benefit the most from a combined methodology

Mechanisms underlying synergistic effects:

- **Anti-depressive/Anxiolytic Effects**
 - Demonstrated effectively for MBCT, ketamine, ayahuasca and psilocybin
 - Psychedelics also led to ↓ symptomatology in healthy volunteers
 - Subverted by psychological effects and neurogenesis, which has been observed for both interventions
- **Mystical Experiences**
 - Predicted therapeutic benefit in both interventions
 - Mindfulness intensified mystical experiences in combined designs
- **Psychological Mechanisms**
 - Cognitive flexibility, emotional flexibility, decentering, nonattachment
- **Neuromodulatory Changes**
 - Acute disruption of the Default Mode Network
 - Long-term enhancements of dynamic global brain connectivity
 - ↑Harmony between DMN and TPN networks

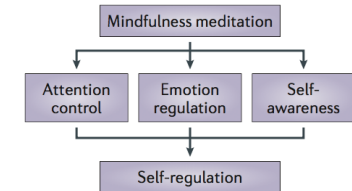


Figure 1: Psychological benefits of mindfulness meditation training (Tang et al., 2017)

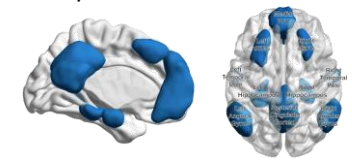


Figure 2: The human Default Mode Network (DMN) (McCormick & Telzer, 2018)