

Practitioner perspectives on meditation-based preparation for psychedelic experiences

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Abstract

The potential of meditation as a preparatory tool for psychedelic experiences lacks empirical investigation. We surveyed experienced practitioners (N=123) with substantial histories in both meditation and psychedelic use to examine meditation's role in psychedelic preparation. Respondents expected meditation training to primarily enhance acceptance and present-moment focus during psychedelic experiences, while also increasing oceanic boundlessness and reducing anxious ego-dissolution. For practitioners with limited meditation experience (1-3 years) and fewer psychedelic sessions (1-20), those adhering to specific meditation traditions reported significantly higher PBMPP scores (Perceived Benefits of Meditation for Psychedelic Preparation) compared to non-adherents. However, among highly experienced meditators (10+ years) with limited psychedelic experience (1-20 sessions), this pattern reversed, with non-adherents reporting significantly higher PBMPP scores than adherents to specific tradition. When evaluating specific meditation approaches, Loving-Kindness Meditation emerged as the most beneficial preparatory practice, significantly outrating other approaches such as Focused Attention. Exploratory factor analysis of meditative elements identified three distinct components: Positive Emotional States (PES), Mindful Awareness and Insight (MAI), and Concentration Techniques (CT), with PES receiving the strongest endorsement for psychedelic preparation. For practical implementation, participants recommended approximately three weeks of preparation with 30-minute daily sessions, strongly favouring online and asynchronous delivery methods. These results provide empirical groundwork for developing effective evidence-based meditation protocols for psychedelic preparation. They also highlight the importance of considering psychedelic users' level of previous meditation experience in optimising such interventions. Future research directions should include controlled trials examining specific meditation practices' effects on psychedelic experiences and outcomes across different populations and contexts.

1 Introduction

Renewed research initiatives since the early 2000s have demonstrated promising clinical outcomes for psychedelics in treating various mental health conditions, including depression, substance use disorders, post-traumatic stress disorder, anorexia, and obsessive-compulsive disorder [1-5]. Despite increasing scientific interest in psychedelics' therapeutic potential, it remains imperative to acknowledge their associated risks [6-9]. Multiple studies document that individuals frequently characterise their psychedelic experiences as among their most psychologically challenging life events [10-13], with a subset of participants reporting persistent adverse effects that extend beyond the acute pharmacological period [14, 15]. Crucially, research has identified an individual's psychological state prior to psychedelic administration as a key determinant of both experiential quality and therapeutic outcomes [16-20]. This has spurred growing interest in developing psychological preparation techniques aimed at optimising this 'pre-state' to enhance safety and efficacy of psychedelic sessions [19, 21, 22].

While this scientific acknowledgment or preparation marks a significant advancement in contemporary psychedelic therapy, it also resonates with the wisdom of Indigenous cultures, which have historically placed great emphasis on preparation for psychedelic experiences [23-25]. This includes the development of sophisticated preparation frameworks that integrate intention-setting, dietary practices, and psycho-spiritual rituals into ongoing relational processes [26-35]. Within these traditions, altered states of consciousness are embedded in a broader cultural and spiritual context, with preparatory practices playing a critical role in shaping the outcomes of these experiences [30, 36, 37]. While contemporary psychedelic therapy has been both explicitly and implicitly influenced by Indigenous practices [27, 38, 39], preparation and cultural frameworks have not received sufficient research attention, despite mounting evidence of their therapeutic importance [20-22]. This underemphasis on preparation underscores the need for new models that draw inspiration from a wide range of practices, including traditional practices which have developed through centuries of experience with these substances. Simultaneously, these novel approaches to psychedelic preparation need to address the specific demands of Western therapeutic and research settings [40-43]. Simply transplanting Indigenous frameworks into Western contexts risks stripping them of their intended meanings and reducing their effectiveness when removed from their cultural foundations [30, 44-46]. Instead, these novel frameworks must carefully navigate this cultural gap, ensuring that psychedelic experiences retain their safety, therapeutic depth and transformative potential.

Contemporary contemplative practices, including some forms of modern meditation, exemplify the remarkable capacity of a practice (or framework) to preserve its foundational principles while adapting to varied and evolving contexts. While meditation encompasses diverse contemplative practices, we focus here specifically on its 'mind-training' aspects, that is, systematic techniques for cultivating the focus and stability of attention and awareness. Meditation traditions provide an instructive model for cultural adaptation, demonstrating through the "cycle of meaning" [47] how practices can maintain their transformative essence while evolving across diverse cultural contexts [48-51] - a capacity particularly relevant for integrating traditional practices into contemporary therapeutic paradigms. However, when meditation practices are divorced from their cultural and interpretive foundations - for example, through commodification or de-contextualisation - they risk being reduced to superficial techniques focused solely on relaxation or, in perhaps the ultimate form of secular appropriation, recast as tools for workplace productivity, thereby diminishing their profound potential for personal transformation [52, 53]. This

historical tension mirrors the challenges faced by contemporary psychedelic therapy, where traditional practices must be integrated into modern paradigms without losing their depth or cultural significance [38]. Meditation's enduring capacity to navigate these challenges underscores its relevance as a model for designing preparation frameworks that respect and adapt ancient wisdom to meet the ethical, cultural, and practical needs of Western therapeutic settings.

The scientific exploration of meditation's therapeutic potential has followed a trajectory somewhat similar to that of psychedelic research, with both fields experiencing substantial growth in recent decades [54, 55]. These parallel paths now converge meaningfully in what has been termed the 'third wave' of meditation research [56], where investigation of advanced meditation, that is, skills, states, stages, and transformations that are the result of mastery and ongoing meditation practice [57-61], has revealed striking similarities with psychedelic experiences. Both domains consistently report phenomena such as self-transcendence and non-dual awareness [60-67], characterised by the dissolution of self-boundaries, profound experiences of unity, and transformative shifts in perception and emotional processing [68-72]. The parallels extend beyond phenomenological descriptions into shared neurobiological mechanisms, including modulation of the default mode network (DMN) [73-77], increased neural complexity [78-82], and systematic changes in brain regions associated with self-referential processing, emotional regulation, and sensory integration [83, 84]. These convergent findings have catalysed growing interest in potential synergies between meditation and psychedelics [70, 85-89]. However, while some research has examined meditation's role during psychedelic sessions or in post-session integration [90-96], the systematic investigation of meditation as a preparatory tool for psychedelic experiences remains largely unexplored, representing a promising frontier for research.

Meditation may optimise the pre-psychedelic state through its influence on psychological states and traits linked to therapeutic outcomes. Empirical evidence demonstrates that pre-session psychological states - including anxiety levels, mood, and mindfulness - predict the quality and outcomes of psychedelic experiences [16, 18, 97]. Meditation reliably modulates these key variables [98-101], fostering psychological conditions associated with enhanced safety and therapeutic benefit in psychedelic sessions. Crucially, meditation can also lead to lasting changes in psychological traits - including absorption capacity (the ability to become fully immersed in experiences) [102-104], openness to experience (willingness to engage with novel ideas and experiences) [105-109], and acceptance (non-judgmental awareness of present-moment experiences) [110-114] - traits which have been shown to significantly predict mystical experiences during psychedelic sessions, with trait absorption being particularly influential [18, 115, 116]. Importantly, the relationship between states and traits appears cyclical: regular meditation practice strengthens trait characteristics that, in turn, facilitate deeper meditative states, creating a self-reinforcing cycle of psychological development [117-119]. The cultivation of these psychological capacities through meditation practice suggests its potential role in establishing both immediate readiness and longer-term psychological resilience for psychedelic experiences. However, questions remain about optimal preparation periods and practice intensity needed to develop these beneficial traits, highlighting the need for systematic research into meditation-based preparation protocols.

In addition to enhancing the pre-state, meditation may serve as a valuable tool for psychedelic preparation by reconfiguring the architecture of subjective experience. Through sustained practice, meditators may develop greater skill in distinguishing direct experience from habitual mental patterns [54], gradually

learning to recognise and adjust their mind's automatic predictions about reality - a capacity that predictive processing theory describes as the revision of hierarchical predictive models [120-122]. This refinement promotes an immediate, non-conceptual awareness that allows for more adaptive engagement with present-moment experiences [79, 123-127]. Such meditation-induced changes [128], share important neurocomputational parallels with psychedelic states, as evidence suggests that both experiences involve temporary relaxation of rigid mental models and increased neural complexity, implying common mechanisms in the modulation of predictive hierarchies [69, 80, 82]. However, while meditation typically cultivates this flexibility gradually, psychedelics can induce rapid shifts in predictive processing that may prove destabilising, potentially resulting in so-called 'ontological shock' - a fundamental disruption of core beliefs about reality and existence [129, 130]. While such destabilising experiences can also occur in intensive meditation practice, particularly when practitioners advance too quickly through contemplative stages [131-134], the gradual nature of most meditation training helps develop specific cognitive capacities that serve as protective factors: enhanced metacognitive awareness enables stable observation of changing mental states [135-137], while reduced self-referential processing [138-140] and increased tolerance for uncertainty facilitate skilful navigation of altered states of consciousness [141, 142]. This convergence between contemplative practices and neuroscientific understanding of predictive processing suggests meditation may offer valuable protective mechanisms when entering altered states of consciousness.

To translate the potential synergy between meditation and psychedelics into practical benefits, it is essential to identify which aspects of meditation are most valuable for preparation. This requires understanding not only how adherence to specific traditions shapes outcomes, but also distinguishing between various meditation 'practices' that provide structured methods (e.g., Loving-Kindness, Open Monitoring), the meditative 'elements' that constitute these practices (e.g., equanimity, non-discriminatory awareness), and the underlying psychophysiological 'processes' (e.g., emotion regulation, body awareness) [79, 143-145]. Each of these components plays a distinct yet interconnected role: practices provide structured methodological frameworks, meditative elements constitute the fundamental building blocks of these practices, and these processes are thought to represent the underlying mechanisms through which they affect mind and body. The significance of these elements extends beyond experienced practitioners; their accessibility to beginners, such as participants in clinical trials or the general population, is equally crucial. For those new to meditation, the ability to easily understand and engage with these practices is just as important as the theoretical depth of awareness they could cultivate. Therefore, it is imperative that these individuals have the time, resources and motivation required to develop a mindfulness practice that is therapeutically meaningful in this context. By examining how these aspects of 'mind-training' interact and manifest across practitioner experience levels, we can develop more targeted preparatory protocols that enhance psychedelic-assisted therapy outcomes while maximising benefits and minimising risks across diverse populations.

Given the current paucity of empirical research on the utility of meditation as a preparatory tool for psychedelic experiences, a valuable approach is to draw on the first-person insights of individuals with substantial experience with both meditation and psychedelic use [146, 147]. These individuals can provide nuanced perspectives on how meditation might enhance psychedelic preparation, including identifying which aspects of the experience benefit most. Perceptions of meditation's utility may be shaped by meditation experience, prior psychedelic experiences, and whether practitioners adhere to specific contemplative traditions. Such adherence might involve following established traditions (e.g., *Theravāda*

Buddhism, Sufism etc.,) which provide philosophical frameworks and approaches that inform how meditation is understood and practiced. Importantly, contemporary meditation practices often diverge from their traditional contexts, where techniques (e.g., *Vipassana*, *Murāqabah* etc.,) are typically integrated into broader systems of philosophical inquiry, ritual, and mind transformation. In contrast, Western adaptations may isolate these practices from their cultural frameworks, potentially altering both their implementation and perceived effectiveness. Understanding whether adherence to a meditation tradition - regardless of the specific tradition - or a lack thereof impacts views on meditation's role in psychedelic preparation is a crucial step in developing evidence-based meditation protocols. However, it is important to acknowledge that individual experiences are highly contextual, shaped by personal, cultural, and situational factors, even within traditional frameworks. In this context, as research evolves, a pluralistic and iterative approach that incorporates both empirical data and dialectical engagement with meditation and psychedelic practitioners will be essential. This challenging process holds the potential to develop robust frameworks that address the variability in user experiences and bridge the gap between controlled research and real-world applications in this rapidly evolving field [148].

This study seeks to address current gaps by exploring the perspectives of individuals experienced in both meditation and psychedelic use, with the goal of shaping evidence-based meditation protocols for psychedelic preparation. Through a comprehensive survey we examined: (a) the perceived benefits of meditation training for psychedelic preparation, specifically focusing on how these benefits were influenced by three factors - meditation tradition adherence, lifetime meditation experience, and lifetime psychedelic use; (b) the anticipated impact of meditation on various aspects of the psychedelic experience, assessed using standardised scales; (c) the perceived helpfulness of specific meditation practices, importance of meditative elements, and relevance of psychological processes for psychedelic preparation; and (d) participant recommendations for designing a meditation program tailored to psychedelic sessions. By drawing on the insights of this uniquely qualified group, we aim to provide empirically grounded data to inform future research and contribute to the development of evidence-based preparation protocols.

2 Methods

This study was conducted in accordance with the Declaration of Helsinki and approved by the University College London Research Ethics Committee (ID: 19437/001). All participants provided informed consent via a secure online platform after reviewing comprehensive study information. Participation was voluntary and uncompensated, and participants were informed of their right to withdraw at any stage of the study without penalty.

Participants and recruitment

Experienced meditators with prior psychedelic experience were recruited through social media platforms (Twitter/X, Reddit, LinkedIn), direct referrals, and word of mouth. Eligibility criteria required participants to have maintained a regular meditation practice, defined as meditating at least three times per week for a minimum of 30 minutes per session, over the past year; self-identified as having experienced a high-dose session with a classic psychedelic substance (e.g., psilocybin, LSD, DMT, 5-MeO-DMT), distinguishing such experiences from microdosing based on dosage (e.g., ≥ 100 μg LSD or ≥ 2 g psilocybin-containing mushrooms) and noticeable subjective effects, such as perceptual changes or altered states of consciousness; be 18 years of age or older; and demonstrate fluency in spoken and written English.

Procedure

Data collection occurred via an anonymous online survey (Qualtrics) from September 1, 2023, to March 31, 2024. The survey, requiring approximately 25-30 minutes to complete, comprised demographic items, assessments of meditation and psychedelic experience, and a series of randomised measures. These measures included scales assessing perceived benefits of meditation for psychedelic preparation, anticipated effects on mindfulness and altered states of consciousness, and preferences for meditation approaches and techniques. The survey evaluated the perceived impact of meditation on psychedelic experiences and gathered perspectives on developing structured meditation programs for psychedelic preparation.

Measures

Participant characteristics

Demographic information was collected on participants' age, gender, ethnicity, country of residence, education level, and religious affiliation. Participants provided exact details about their meditation experience, including the number of years of practice, weekly frequency of meditation, and the average duration of each session. For analysis purposes, the number of years of meditation practice was categorised into three levels: '1-3 years', '3-10 years', and '10+ years'. Participants were also asked whether they adhered to a specific meditation tradition, which was coded as a binary variable ('Adherence' or 'Non-adherence'). Similarly, participants reported their total number of full-dose psychedelic experiences with classic serotonergic psychedelics (e.g., psilocybin, LSD, DMT, 2CB, ayahuasca, mescaline) or atypical psychedelics (e.g., salvia). Full doses were defined as those producing substantial alterations in consciousness, distinct from sub-perceptual microdoses. For analysis, psychedelic use was grouped into two categories: '1-20 occasions' and '20+ occasions'. The variables of meditation experience, meditation tradition adherence, and psychedelic experience were included as independent predictors in a three-way

between-subjects ANOVA to examine their relationship with PBMPP total scores, as described in the Statistical Analysis section.

Perceived benefits of meditation for psychedelic preparation (PBMPP)

Seven items evaluated participants' perceptions of how a structured meditation course prior to a psychedelic session might influence the experience. Specifically, participants were asked whether meditation training would: (i) increase the likelihood of a positive psychedelic experience, (ii) enhance safety during the experience, (iii) facilitate the emergence of helpful insights, (iv) support smoother post-experience readjustment and integration, and (v) lead to lasting benefits. Additionally, participants were asked whether meditation training could (vi) help individuals access deeper meditative states during the psychedelic experience and (vii) reduce the likelihood of negative experiences. Responses were recorded on an 11-point Likert scale (0 = 'strongly disagree', 10 = 'strongly agree'). A composite Perceived Benefits of Meditation for Psychedelic Preparation (PBMPP) score was calculated as the mean of these seven items, with higher scores indicating stronger endorsement in meditation's beneficial effects on psychedelic experiences. This composite PBMPP score was used as the outcome variable in the three-way between-subjects ANOVA to examine the effects of meditation tradition, meditation experience, and psychedelic experience, as described in the Statistical Analysis section.

State mindfulness (modified CAMS-R)

We modified the 12-item Cognitive and Affective Mindfulness Scale Revised (CAMS-R) [149] to assess participants' endorsements about how pre-psychedelic meditation training might enhance specific mindfulness capabilities during a psychedelic experience. This modification was designed to focus on mindfulness as a set of cognitive and affective processes rather than as a meditation practice per se. The adapted scale maintained the original four factors: Attention, Present-Focus, Awareness, and Acceptance. Items were rephrased to reflect anticipated changes in these capacities during a psychedelic experience following meditation training. Participants were asked to rate their agreement with statements beginning with "Training in meditation before using a psychedelic would probably enhance someone's ability to..." Examples of items included: "... concentrate during the psychedelic experience" (Attention factor), "... describe their feelings in detail during the experience" (Awareness factor), "... accept uncontrollable aspects of the psychedelic experience" (Acceptance factor), and "... focus on the present moment during the experience" (Present-Focus factor). Responses were recorded on a 11-point Likert scale (0 = 'strongly disagree', 10 = 'strongly agree'), with an additional 'n/a' option for participants unable to answer. The complete set of items is available in **Supplementary Material I**.

Altered states of consciousness (5D-ASC)

Participants rated how pre-psychedelic meditation training might influence each of the five general dimensions derived from the Altered States of Consciousness Dimensions (5D-ASC) scale [150]. Rather than completing the full questionnaire, participants rated these summarised dimensions: (1) Oceanic Boundlessness (OBN): positive and enjoyable aspects of the psychedelic experience associated with the experience of boundary dissolution between oneself and the surroundings as well as the dissolution of time and space; (2) Anxious Ego-Dissolution (AED): negative psychedelic experiences associated with depersonalisation and dissociation; (3) Visionary Restructuration (VRS): perceptual and imaginal alterations including visual phenomena; (4) Acoustic Alterations (AA): changes regarding auditory perceptions and acoustic hallucinations; and (5) Vigilance Reduction (VIR): the experience of clouded

consciousness, sleepiness, or drowsiness. Ratings were made on a 11-point Likert scale (-5 = ‘greatly decrease’, +5 = ‘greatly increase’).

Meditation ‘practices’

To assess how different types of meditation might prepare individuals for psychedelic experiences, we examined four fundamental categories of meditation practice: Focused Attention (FA), Open Monitoring (OM), Loving-Kindness (LKM), and Self-Transcendence (ST). These categories represent distinct styles or approaches to meditation training, drawing from established research literature and recent systematic reviews [79, 143, 144]. Each practice was described to participants as follows: FA involves sustained voluntary attention to a selected target stimulus, requiring continuous monitoring of attention and active disengagement from distractors. OM cultivates moment-to-moment awareness of arising mental content without selective focus or conceptual engagement. LKM develops sequential positive emotional states beginning with self-compassion and extending outward, enhancing prosocial cognitive and affective processes. ST reduces self-referential processing, altering the perceived boundaries between self and non-self experience. Participants rated how helpful they believed each practice would be for preparing someone for a psychedelic experience using an 11-point scale (0 = ‘not at all helpful’, 10 = ‘extremely helpful’), with an option to indicate not applicable (‘n/a’).

Meditative ‘elements’

While meditation practices represent different approaches to training, we also examined specific abilities that practitioners develop through these practices. Through literature review [136, 144, 151-155] and expert consultation with two experienced meditation practitioners (authors AL and DK, with over 60 years of combined teaching and research experience), we identified 18 key meditative elements. These meditative elements represent specific competencies that meditators can develop and apply: (1) observing attention, (2) positive emotion cultivation, (3) relaxation/tranquillity cultivation, (4) recognising and releasing distractions, (5) recognising interconnectedness of phenomena, (6) non-discriminatory awareness, (7) ongoing awareness, (8) insight, (9) equanimity, (10) empathy and compassion, (11) comfort with discomfort, (12) sense of humour, (13) curiosity, (14) one-pointed concentration, (15) visualisation, (16) mantra repetition, (17) body scan, and (18) noting. Participants rated how important they believed each meditative element would be for psychedelic preparation using an 11-point scale (0 = ‘not at all important’, 10 = ‘extremely important’), with an option to indicate uncertainty (‘n/a’). Detailed descriptions of each meditative element are provided in **Supplementary Material I**.

Meditation ‘processes’

Beyond specific practices and meditative elements, we examined fundamental psychological processes that meditation training can influence [145]. Participants rated five key processes: (1) Attention Regulation: sustaining attention on the chosen object and returning attention whenever distracted; (2) Body Awareness: focusing on internal experiences such as breathing, emotions, or other body sensations; (3) Emotion Regulation I: approaching ongoing emotional reactions non-judgmentally, with acceptance; (4) Emotion Regulation II: being able to ‘stay with’ strong emotions and whatever is present in the field of awareness, letting oneself be affected without trying to escape or suppress them; and (5) Change in Perspective on the Self: detachment from identification with a static sense of self, seeing the activities of the mind and body as fleeting occurrences rather than as ‘reality’. Participants rated how relevant they believed each process

would be for psychedelic preparation using an 11-point scale (0 = ‘not at all relevant’, 10 = ‘extremely relevant’), with an option to indicate uncertainty (‘n/a’).

Meditation training parameters

Open-ended responses were collected regarding ideal training duration (in days and daily meditation minutes). Binary (yes/no) questions assessed perspectives on online delivery and asynchronous instruction viability.

Statistical analysis

All analyses were conducted using Python 3.12.5. Where relevant, statistical tests were two-tailed with an $\alpha = 0.05$.

Descriptive statistics

We computed descriptive statistics for all variables: means, standard deviations, and 95% confidence intervals for continuous measures; frequencies and percentages for categorical variables. For recommended meditation training duration measures, we excluded potential outliers as data points exceeding 3 standard deviations from the mean [156].

Effects of meditation tradition, meditation experience, and psychedelic use on PBMPP scores

We conducted a three-way between-subjects analysis of variance (ANOVA) with PBMPP total scores as the dependent variable and meditation tradition adherence (adherent vs. non-adherent), meditation experience (1-3 years, 3-10 years, 10+ years), and psychedelic experience (1-20 occasions, 20+ occasions) as independent variables. Due to violations of the homogeneity of variance assumption, heteroscedasticity-consistent (HC3) standard errors were applied in the analysis [157]. Post-hoc comparisons of the model-derived estimated marginal means (EMMs) were performed using pairwise comparisons adjusted with HC3 standard errors. Simple effects of meditation tradition were tested at each combination of meditation experience and psychedelic experience. Assumptions of normality and homogeneity of variance were evaluated using both statistical tests and visual diagnostics (**Supplementary Material II**).

Expected influence of meditation training on CAMS-R and 5D-ASC factors

To examine differences between factors of the CAMS-R and dimensions of 5D-ASC, we conducted two separate one-way repeated measures ANOVAs. Assumptions of normality and sphericity were evaluated using Mauchly’s test and visual diagnostics (**Supplementary Material II**). For both analyses, Mauchly’s test indicated violations of sphericity (CAMS-R: $W = 0.829$, $p < .001$; 5D-ASC: $W = 0.452$, $p < .001$), thus Greenhouse-Geisser corrections were applied (CAMS-R: $\epsilon = 0.901$; 5D-ASC: $\epsilon = 0.749$). Post-hoc pairwise comparisons were conducted using paired t-tests with Bonferroni correction to control for multiple comparisons.

Perceived efficacy of meditation practices and processes for psychedelic preparation

To examine differences in perceived efficacy across meditation practices and meditation-related processes, we conducted two separate repeated measures ANOVAs. Assumptions of normality and sphericity were evaluated using both statistical tests and visual diagnostics (**Supplementary Material II**). Post-hoc pairwise t-tests were performed using Bonferroni correction to adjust for multiple comparisons.

Exploratory Factor Analysis (EFA) of meditative elements

To explore the underlying structure of the 18 meditative elements, we conducted an exploratory factor analysis (EFA) on the 18 items using maximum likelihood (ML) estimation with oblimin rotation. The primary aim was to identify coherent factor structures rather than reduce the data. One missing value was handled through listwise deletion. The Kaiser-Meyer-Olkin measure ($KMO = 0.879$) and Bartlett's test of sphericity ($\chi^2(153) = 1149.62, p < .001$) indicated that the data were suitable for factor analysis.

We evaluated factor solutions ranging from one to five factors using several criteria: parallel analysis, scree plot, fit indices, proportion of variance explained, and interpretability. Parallel analysis and the scree plot suggested a two-factor solution. However, after considering the fit indices, proportion of variance explained, and the interpretability of the factor loadings, we selected a three-factor solution. This solution provided a good balance between model fit, explained variance, and theoretical coherence (**Supplementary Material III**).

The three-factor structure was refined over four iterations. Items were considered for removal if they had low loadings (< 0.4) or problematic cross-loadings (primary loading ≥ 0.4 , secondary loading ≥ 0.32 , with a difference < 0.2 between them) [156, 158, 159]. This process was repeated until all retained items loaded strongly and uniquely onto a single factor, resulting in a final set of 12 items. For the final EFA model, we calculated factor loadings, communalities, proportion of variance explained, and factor correlations. Factor scores were computed using the mean of items loading on each factor. Internal consistency reliability was assessed using Cronbach's alpha. Descriptive statistics were calculated for each factor score.

3 Results

Participant characteristics

Our study sample consisted of 123 participants, predominantly male (66.67%), white (79.67%), and highly educated (79.68% with at least an undergraduate degree), with a mean age of 41.1 years (SD = 13.5). Participants reported a median of 7.4 weekly meditation sessions (SD = 4.6), each lasting an average of 46.4 minutes (SD = 33.4). The sample represented 24 countries, with 43.90% from the United States. Meditation experience varied: 1-3 years (37.40%), 3-10 years (24.39%), and over 10 years (38.21%). In terms of meditation tradition, 59.35% identified with one or more traditions, while 40.65% did not. All participants had prior psychedelic experiences, with 43.09% reporting over 20 lifetime experiences. Detailed participant characteristics are provided in **Supplementary Material IV**.

Perceived benefits of meditation training for psychedelic preparation

Overall perceived benefits

Participants generally rated the potential benefits of meditation training for psychedelic preparation highly, with consistently strong PBMPP scores across all items (**Fig.1a**). The highest ratings were for post-experience integration (M = 7.81, SD = 2.11) and increasing the likelihood of positive experiences (M = 7.50, SD = 2.24). Other perceived benefits, such as gaining helpful insights (M = 7.31, SD = 2.19), facilitating safer experiences (M = 7.34, SD = 2.50), accessing deeper meditative states (M = 7.26, SD = 2.41), and deriving lasting benefits (M = 7.28, SD = 2.19), all received similarly high ratings. While reducing the likelihood of negative experiences was rated slightly lower (M = 6.89, SD = 2.26), the scores still indicated a generally positive view of meditation's potential to mitigate negative outcomes.

Factors influencing perceived benefits

A three-way ANOVA revealed a significant interaction between meditation tradition, meditation experience, and psychedelic use on total PBMPP scores, $F(2, 111) = 3.987, p = 0.02$. Main effects and two-way interactions were observed, but these were best understood within the context of the higher-order interaction (see **Supplementary Material V** for full ANOVA results).

Post-hoc pairwise comparisons were conducted to explore the simple effects of meditation tradition across different combinations of meditation experience and psychedelic use. Among participants with least meditation (1-3 years) and psychedelic experience (≤ 20 lifetime occasions), adherents to a meditation tradition perceived the benefits of meditation for psychedelic preparation to be greater (higher PBMPP scores) compared to non-adherents (Estimate = -1.44, SE = 0.56, $t(111) = -2.59, p = 0.01$). Conversely, participants with the most meditation experience (≥ 10 yr) and relatively limited psychedelic experience (1-20 occasions), non-adherents had significantly higher PBMPP scores than adherents (Estimate = 1.38, SE = 0.68, $t(111) = 2.04, p = 0.04$). No significant differences were observed in other comparisons (see **Supplementary Material VI** for detailed post-hoc comparisons). **Fig.1b** visualises the interaction, highlighting how PBMPP scores vary across different levels of meditation experience and psychedelic use.

Expected influence of meditation training on CAMS-R and 5D-ASC factors

The analysis of expected benefits of meditation training on mindfulness factors during a psychedelic experience (CAMS-R) revealed significant differences between factors ($F(2.7, 329.75) = 40.20, p < .001$,

ges = 0.06). Participants anticipated the greatest improvements in Acceptance ($M = 7.69$, $SD = 1.84$), followed by Present-Focus ($M = 7.29$, $SD = 2.17$), Awareness ($M = 6.63$, $SD = 1.88$), and Attention ($M = 6.43$, $SD = 1.86$). Post-hoc analyses revealed that Acceptance ratings were significantly higher than all other factors, and Present-Focus was significantly higher than both Awareness and Attention (all $ps < .001$). Awareness and Attention did not differ significantly ($p = .345$) (**Fig.1c**).

For the 5D-ASC scale, significant differences were found between dimensions ($F(3, 365.58) = 107.00$, $p < .001$, $ges = 0.34$). Participants expected meditation training to most strongly enhance Oceanic Boundlessness (OBN; $M = 2.98$, $SD = 1.55$) and reduce Anxious Ego-Dissolution (AED; $M = -1.01$, $SD = 2.55$). Minor increases were noted for Acoustic Alterations (AA; $M = 0.84$, $SD = 1.51$) and Visionary Restructuralisation (VRS; $M = 0.73$, $SD = 1.49$), while expectations for Vigilance Reduction remained near neutral (VIR; $M = -0.13$, $SD = 1.91$). Post-hoc comparisons revealed significant differences between all dimensions (all $ps < .001$) except between AA and VRS ($p = 1.00$) (**Fig.1d**).

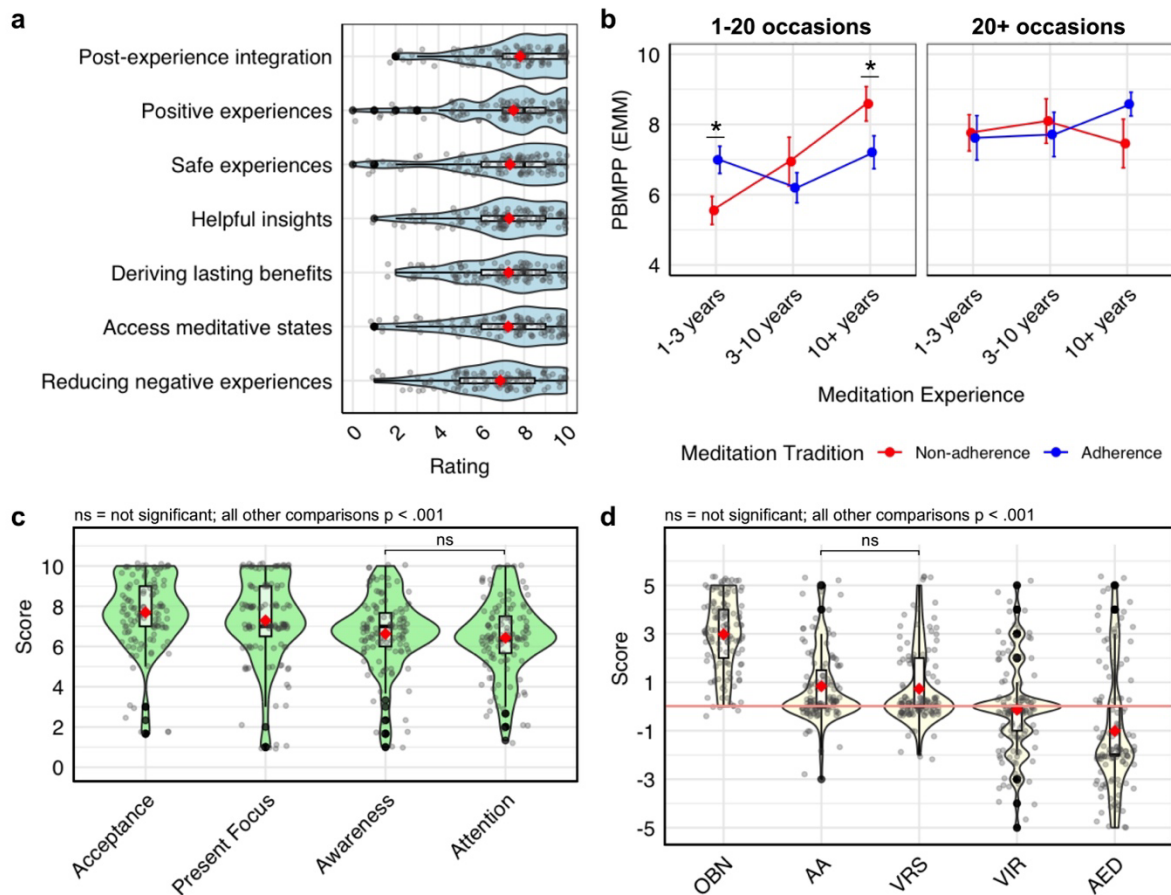


Figure 1. Perceived benefits and expected effects of meditation training on psychedelic experiences. (a) Violin plots showing score distributions with individual data points (grey dots), means (red diamonds), and medians with interquartile ranges (black boxplots) for Perceived Benefits of Meditation for Psychedelic Preparation (PBMPPP) scale across seven benefit domains; (b) Interaction between meditation experience, tradition adherence, and psychedelic use frequency on PBMPPP scores, shown as estimated marginal means \pm 95% confidence intervals, stratified by meditation tradition adherence (red: non-adherence, blue: adherence) and psychedelic use frequency (1-20 vs. 20+ occasions). Asterisks indicate significant differences between adherence groups ($*p < 0.05$); (c, d) Violin plots as in (a) showing: (c) Expected effects on Cognitive and Affective Mindfulness Scale-Revised (CAMS-R) factors, where all pairwise

comparisons were significant ($p < .001$) except between Awareness and Attention (ns); (d) Expected effects on 5D-ASC (Altered States of Consciousness) dimensions, where all pairwise comparisons were significant ($p < .001$) except between AA and VRS (ns). Red horizontal line at 0 indicates neutral expectation; positive/negative scores indicate anticipated enhancement/reduction. OBN: Oceanic Boundlessness; AA: Acoustic Alterations; VRS: Visionary Restructuralisation; VIR: Vigilance Reduction; AED: Anxious Ego-Dissolution.

Perceived efficacy of meditation approaches for psychedelic preparation

Meditation ‘practices’

Participants rated the perceived helpfulness of four meditation practices (Loving Kindness (LKM), Open Monitoring (OM), Self-Transcendence (ST), and Focused Attention (FA)) for psychedelic preparation (Figure 2a). LKM received the highest mean rating ($M = 8.07$, $SD = 2.14$), followed by OM ($M = 7.29$, $SD = 2.11$), ST ($M = 6.96$, $SD = 2.24$), and FA ($M = 5.28$, $SD = 2.02$). A repeated measures ANOVA revealed significant differences in perceived efficacy across meditation categories, $F(3, 363) = 37.19$, $p < .001$, $\eta^2 = 0.191$. Post-hoc comparisons using Bonferroni-corrected t-tests showed that LKM was rated significantly higher than all other categories ($ps < .001$, ds ranging from 0.519 to 1.50), while FA was rated significantly lower than all other categories ($ps < .001$, ds ranging from -0.930 to -1.22). No significant difference was observed between OM and ST ($p = .262$, $d = 0.260$).

Meditative ‘elements’

Participants rated 18 meditative elements on their perceived importance for psychedelic preparation (Fig. 2c; **Supplementary Material VII**). Ratings ranged from ‘Sense of humour’ ($M = 8.01$, $SD = 1.78$) and ‘Comfort with discomfort’ ($M = 7.86$, $SD = 1.97$) as the highest, to ‘Mantra’ repetition ($M = 3.67$, $SD = 2.13$) as the lowest.

An EFA of the meditative elements revealed a three-factor structure (**Fig.2d**), explaining 50.16% of the variance. The factors were labelled as: Positive Emotional States (Factor 1; 19.70% variance explained); Mindful Awareness and Insight (Factor 2; 16.84% variance explained); Concentration Techniques (Factor 3; 13.62% variance explained). Factor loadings, communalities, and reliability analyses are provided in Supplementary Material VIII. Internal consistency was good for all factors: Positive Emotional States ($\alpha = 0.83$), Mindful Awareness and Insight ($\alpha = 0.79$), and Concentration Techniques ($\alpha = 0.72$). Descriptive statistics showed that Positive Emotional States had the highest mean score ($M = 7.72$, $SD = 1.69$), followed by Mindful Awareness and Insight ($M = 6.97$, $SD = 1.64$), and Concentration Techniques ($M = 4.61$, $SD = 1.72$) (**Fig.2e**).

Meditation ‘processes’

Participants also rated the perceived relevance of five meditation-related processes for psychedelic preparation (**Fig.2b**). Emotion Regulation II received the highest rating ($M = 7.87$, $SD = 2.10$), followed by Emotion Regulation I ($M = 7.74$, $SD = 2.19$), Change in Perspective (of Self) ($M = 7.37$, $SD = 2.20$), Body Awareness ($M = 6.80$, $SD = 2.21$), and Attention Regulation ($M = 5.67$, $SD = 2.38$). A repeated measures ANOVA showed significant differences in perceived relevance across meditation-related processes, $F(4, 488) = 21.809$, $p < .001$, $\eta^2 = 0.116$. Post-hoc tests with Bonferroni correction revealed that Attention Regulation was rated significantly lower than all other processes ($ps < .001$, d values ranging from -0.659 to -1.25). Body Awareness was rated significantly higher than Attention Regulation ($p < .001$, $d = -0.659$) but significantly lower than both Emotion Regulation I ($p < .001$, $d = -0.740$) and Emotion

Regulation II ($p < .001$, $d = -0.830$). Change in Perspective (of Self) was rated significantly higher than Attention Regulation ($p < .001$, $d = -0.978$) but did not differ significantly from Body Awareness ($p = .098$, $d = -0.335$) or the two emotion regulation processes ($ps > .05$, $ds = -0.297$ to -0.358). Lastly, there was no significant difference between Emotion Regulation I and Emotion Regulation II ($p = .300$, $d = -0.133$). These findings suggest that participants perceived emotion regulation and perspective-shifting processes as particularly relevant for preparing for psychedelic experiences, while attention regulation was rated as less relevant.

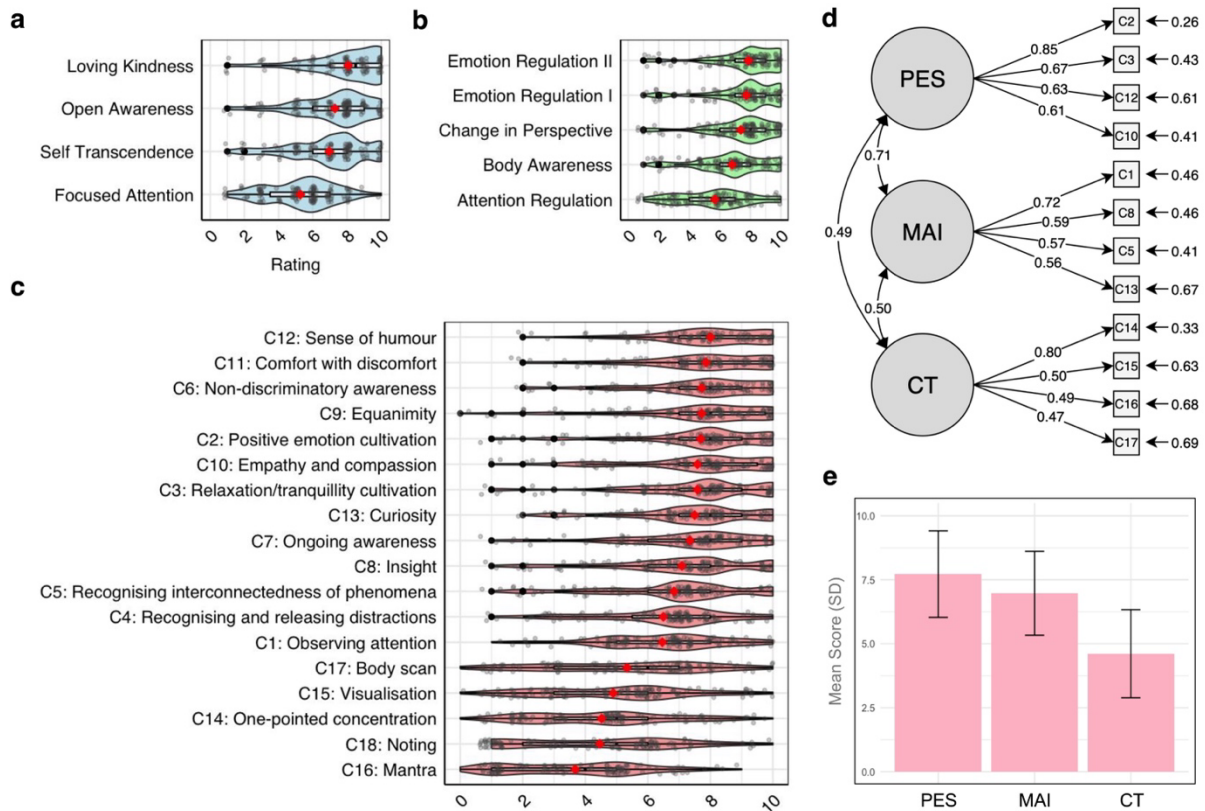


Figure 2. Perceived helpfulness of meditation practices, processes, and factor analysis of meditative elements for psychedelic preparation. (a) Violin plots showing rating distributions with individual data points (grey dots), means (red diamonds), and medians with interquartile ranges (black boxplots) for meditation practices: Loving Kindness, Open Awareness, Self Transcendence, and Focused Attention. All pairwise comparisons significant ($p < .001$) except between Open Awareness and Self Transcendence (ns); (b) Violin plots as in (a) showing ratings for meditation-related processes: Emotion Regulation II, Emotion Regulation I, Change in Perspective, Body Awareness, and Attention Regulation. Attention Regulation rated significantly lower than all other processes ($p < .001$); (c) Violin plots as in (a) showing importance ratings for 18 distinct meditative elements (C1-C18), ordered by mean rating; (d) Exploratory factor analysis loadings showing three factors: Positive Emotional States (PES), Mindful Awareness and Insight (MAI), and Concentration Techniques (CT). Numbers by straight arrows indicate factor loadings; curved arrows show factor correlations; numbers by boxes indicate residual variances; (e) Mean scores (\pm SD) for the three factors identified in (d).

Recommended meditation training parameters

Participants recommended an average of 22.24 days ($SD = 11.53$) of meditation training for effective psychedelic preparation, with a daily practice duration of 30.81 minutes ($SD = 11.90$). A significant

majority supported online delivery of meditation training (86.2%) and endorsed asynchronous (i.e., completing practices independently rather than through live online sessions) training methods (84.6%).

4 Discussion

This cross-sectional study of 123 experienced meditator and psychedelic practitioners reveals an important insight into psychedelic preparation: while contemporary meditation research has predominantly examined attentional processes, our findings indicate that the capacity for adaptive affect regulation may be particularly salient for navigating psychedelic states. Through multiple convergent measures - from specific practice evaluations to ratings of anticipated effects - we found that meditation approaches emphasising psychological flexibility and positive emotional states were consistently rated as more beneficial for preparation than concentration-based techniques. These findings, which varied systematically with meditation experience and tradition adherence, suggest meaningful refinements to current theoretical frameworks while offering empirically grounded insights into how meditation might optimally support psychedelic experiences.

Perceived benefits of meditation for psychedelic preparation

Respondents consistently rated meditation as highly beneficial for enhancing positive experiences, deepening insights, supporting integration, mitigating challenges, and fostering lasting positive effects in psychedelic contexts (PBMPP scores). Regarding anticipated acute effects, participants expected meditation training to enhance mystical-type experiences through increased Oceanic Boundlessness (OBN) and decreased Anxious Ego-Dissolution (AED), while also strengthening mindfulness capabilities during sessions (CAMS-R) - particularly acceptance, which was rated significantly higher than other mindfulness dimensions. These findings broadly support previous proposals about the synergistic relationship between meditation and psychedelics [85, 86, 88, 92]. While participants on average endorsed the potential value of pre-psychedelic meditation training, individual PBMPP ratings showed considerable variation and varied systematically based on their own experience levels with psychedelics and meditation, as well as their connection to a meditation tradition. For example, the results suggested that individuals with less personal experience (with both psychedelics and meditation), but who were adherent to a tradition of practice, gave higher ratings for the potential benefits of meditation as a preparation strategy. These findings suggest that endorsement of meditation for psychedelic preparedness is not simply related to accumulated personal experience but is shaped by how that experience is framed within a meditation tradition, particularly among those with less direct experience with either practice.

There are several possible explanations for this interaction pattern. Traditional contemplative frameworks ('traditions') provide systematic methodologies and detailed phenomenological maps for navigating states of consciousness [160-162]. For practitioners with more limited meditation and psychedelic experience, a theoretical grounding in consciousness exploration, distinct from secular approaches which may emphasise practical wellness benefits, could explain their higher perceived value of meditation for psychedelic preparation. Conversely, for more experienced meditators (10+ years), the higher PBMPP scores among non-adherents to (a) meditation tradition(s) might reflect the benefits of a flexible approach across different meditation traditions - particularly valuable given that psychedelic experiences can manifest in varied and unexpected ways that may benefit from diverse frames of reference and practices. Experienced practitioners can draw from multiple approaches while maintaining proficiency in their application. Additionally, strict adherence to specific contemplative traditions often involves accepting doctrinal positions that can conflict with psychedelic use, both explicitly through rules prohibiting consciousness-altering substances and

implicitly through incompatibilities between traditional practices and psychedelic effects. These findings suggest that beliefs about the benefits of meditation for psychedelic preparation are shaped not only by the quantity of experience but also by how that experience is contextualised within or outside of traditional frameworks. Further research is needed to disentangle these influences and explore their implications for designing meditation-based psychedelic preparation programs.

Loving-Kindness Meditation: a foundational practice for psychedelic preparation

In terms of specific meditation approaches, participants rated Loving-Kindness Meditation (LKM) as the most helpful practice for psychedelic preparation, surpassing approaches such as Open Monitoring (OM), Focused Attention (FA), and Self-Transcendence (ST). Derivations of LKM have been informed by *mettā bhavana* in Pali (the liturgical language of Theravada Buddhism), though they have evolved as distinct approaches within modern contexts. LKM systematically cultivates compassion, kindness, and friendliness, beginning with the target of oneself and expanding outward to include all beings without exception [163-165]. Unlike OM and FA, which primarily develop attentional stability and present-moment awareness, LKM actively fosters a proactive, prosocial orientation that may equip individuals to encounter and process challenging or distressing emotions with acceptance and compassion. This practice not only cultivates self-compassion [166, 167] - a mechanism increasingly recognised as central to psychedelics' therapeutic effects [168-171] - but also builds emotional resilience by increasing one's capacity to sustain compassion and kindness in the face of difficulties [172-176]. LKM reframes emotional disturbances as opportunities for growth, providing a structured framework for cultivating compassion and transforming challenges both within and beyond formal meditation practice. Such emotional resilience, coupled with strategies for integrating challenges, is likely to be especially valuable during psychedelic experiences, where intense, and sometimes challenging, emotions are common [11, 12, 177]. Notably, LKM's unique capacity to elevate and sustain positive affect has also been shown to counteract the 'hedonic treadmill' effect [178] - the well-documented tendency for people to adapt to both positive and negative life events, with happiness levels typically returning to a personal baseline or 'set point' [178-180]. While this adaptive mechanism is generally robust, LKM appears to help sustain elevated positive emotional states beyond this typical return to baseline [173, 174]. This sustained uplift in emotional tone may help foster an optimal pre-state, potentially enhancing the depth and positivity of psychedelic experiences [16-20].

Further insights into the potential of LKM for psychedelic preparation draw from both classical Buddhist teachings and contemporary research. The *Karaṇīya mettā Sutta* advocates cultivating a boundless or 'unlimited' mind (*appamāṇa citta*) that radiates compassion universally, free from self-centred attachment [181, 182]. Early Buddhist texts, such as the *Bojjhaṅgasamyutta* and the *Visuddhimagga*, elaborate on how LKM can foster these boundless states, which include possible progress toward an advanced concentrative absorption meditation known as *jhāna*, that includes states of transcendence of bodily awareness and self-referential thought (*papañca*) [183-185]. Neuroscientific studies have linked this meditative boundlessness to decreased self-referential processing in the default mode network (DMN) [73, 186-189] - a neural shift often associated with OBN during psychedelics [76, 190]. While LKM may facilitate entry into psychedelic OBN states by reducing fear or resistance, its unique value lies in what the practitioner dissolves into: a mental state infused with warmth, connection, and compassion. This reorients the dissolution experience from one of fear or fragmentation to trust and belonging [191, 192]. Unlike practices emphasising detachment or neutrality, LKM actively cultivates care and acceptance, reframing dissolution as integration

into a universal field of goodwill [164, 193]. By training the mind to release rigid self-boundaries while aligning this dissolution with positive emotions, LKM primes individuals for expansive psychedelic states, offering a practical and secular framework that smooths the experience and equips participants to integrate its transformative insights.

LKM also provides a powerful framework for navigating the complexities of psychedelic experiences, which, while often profoundly illuminating, can also pose significant challenges. These include cognitive distortions such as false memories [194, 195] and increased susceptibility to conspiracy theories [196], as well as psychological difficulties including ‘spiritual bypassing’ - where spiritual beliefs are used to sidestep difficult psychological work [197, 198] - and experiences of emotional overwhelm or depersonalisation [13, 14, 130, 199]. These challenges often stem from the profound intensity of psychedelic-induced insights, such as realisations of interconnectedness and impermanence [200-202], alongside individual psychological factors, underscoring the need for practices that balance insight with emotional grounding. Drawing on elements of contemplative traditions, LKM practices emphasise both clear awareness and emotional warmth [203, 204], which may help support the processing of insights while fostering emotional stability [205, 206]. This approach may help create conditions conducive to processing both the profound insights and potential challenges of psychedelic experiences. This perspective aligns with the ‘apprenticeship’ model of psychedelic preparation [207], which emphasises grounding experiences within cultural and emotional frameworks that foster both discernment and connection. By integrating contemplative elements with contemporary approaches, LKM therefore potentially offers a suitable framework for navigating psychedelic experiences and integrating their insights into meaningful, lasting change [54].

Meditation elements and processes: the value of psychological flexibility

Our exploratory factor analysis revealed a three-factor structure underlying the perceived usefulness of meditative elements for psychedelic preparation. These factors: ‘Positive Emotional States’ (PES), ‘Mindful Awareness and Insight’ (MAI), and ‘Concentration Techniques’ (CT), offer a novel framework for understanding how meditation can enhance readiness for psychedelic experiences. PES emerged as the most influential factor, encompassing elements like ‘sense of humour’ and the cultivation of ‘empathy and compassion’. By contrast, CT received notably lower ratings, reflecting a preference for meditative elements that prioritise emotional and cognitive flexibility over concentration-heavy techniques. This pattern aligns with our findings regarding LKM’s perceived value, suggesting that practices fostering adaptability and openness may be particularly critical for navigating the unique challenges of altered states. While the factors are distinct, their moderate to strong correlations suggest a shared contribution to the intricate process of preparing the mind for the transformative dynamics of psychedelics.

The relatively low rating of the CT factor, including FA practices such as ‘one-pointed concentration’, reveals an interesting tension in psychedelic preparation. While FA meditation serves as both a foundational practice in classical contemplative traditions and a primary focus of contemporary neuroscientific research [143, 208-211], its application in psychedelic contexts warrants careful consideration. FA traditionally operates by training practitioners to maintain stable attention, often through focused awareness on specific objects or experiences [190, 212-215]. While this focused attention can take many forms and be applied in various ways, including to expansive states of consciousness, there may be some tension between certain applications of FA and the characteristic features of psychedelic experiences, which often involve

significant shifts in ordinary mental boundaries. Although FA can be valuable for developing beneficial traits such as mental discipline and attention regulation, its role in psychedelic contexts may be most beneficial when adapted to work with, rather than against, the mind's natural tendencies toward expansion. FA may therefore be particularly useful during integration, rather than preparation, where its stabilising qualities can help process insights and ground awareness, while also potentially serving during psychedelic experiences themselves as a tool for deep exploration of specific aspects of consciousness.

While the CT factor's low rating highlights the limitations of control-oriented practices, examining individual elements reveals a nuanced understanding of psychological flexibility in psychedelic preparation. Most notably within the PES factor, 'sense of humour' emerged as the highest-rated element. Various contemplative traditions provide frameworks for understanding humour's transformative potential [216-218]: with some emphasising how insights into impermanence and non-attachment can foster a profound lightness of being [219], while others employ paradoxical exchanges to disrupt fixed patterns of thinking [220]. This understanding extends beyond mere levity to a systematic approach for reframing experience. This understanding extends beyond mere levity to a systematic approach for reframing experience [221], with humour facilitating what Loy [222] terms a "healing deconstruction" - revealing incongruities between expectation and reality in ways that foster openness [217]. These traditional insights resonate with contemporary psychological frameworks, including predictive processing, which explains how humour reduces the precision weighting of prior beliefs, enabling practitioners to reinterpret prediction errors as opportunities rather than threats [120, 223]. This capacity is particularly valuable in altered states that challenge predictive models of reality [80, 124, 224]. The high ratings of both humour and 'comfort with discomfort' suggest that practitioners recognise humour's role in transforming encounters with the unexpected into opportunities for growth [225-227]. By reframing challenging experiences as growth opportunities, humour complements the ability to remain at ease with discomfort, a critical skill for navigating the perceptual and conceptual upheavals characteristic of psychedelic states.

This emphasis on adaptive engagement was further reflected in participants' equal prioritisation of emotion regulation and change in perspective on self as key meditation-related processes, while attention regulation received significantly lower ratings. The high value placed on emotion regulation suggests practitioners recognise a crucial paradox: while psychedelic experiences often overwhelm ordinary regulatory capacities, developing the ability to remain emotionally responsive rather than reactive becomes essential for navigating their intense and unpredictable landscapes [145, 228]. This capacity appears inextricably linked with maintaining a malleable sense of self, as psychedelic experiences frequently induce profound alterations in self-experience [56, 69, 190] that can be either illuminating or destabilising depending on one's preparedness. While some forms of meditation may cultivate meta-awareness and decreased identification with rigid self-concepts [127, 144, 153], our findings suggest these capacities take on particular significance in psychedelic contexts. The parallel emphasis on emotion regulation and self-perspective flexibility, coupled with our earlier findings about PES and LKM, points to a sophisticated understanding among experienced practitioners: optimal psychological preparation may depend less on maintaining rigid control than on developing the capacity to hold self-experience lightly while maintaining emotional equilibrium [229]. This provides further evidence that adaptability - both emotional and perspectival - may be more valuable than sustained attentional focus in preparing for psychedelic experiences.

Meditation training parameters

Participants recommended a meditation training duration of approximately 22 days with 30-minute daily sessions for psychedelic preparation, strongly favouring online delivery (86.2%) and asynchronous training (84.6%). These preferences align with our previous findings from psychedelic-assisted psychotherapy participants [22], who reported similar preferences for program duration ($M = 21$ days) and online delivery (89%). While these consistent recommendations offer a practical foundation for accessible preparatory programs, traditional approaches emphasise the value of in-person facilitation for establishing proper meditation technique. A hybrid model might be optimal, combining initial in-person training for proper foundation with subsequent online support for daily practice maintenance. Future research should empirically evaluate outcomes across online, in-person, and hybrid approaches to establish evidence-based guidelines for meditation-based psychedelic preparation.

Limitations and future directions

Our study's primary methodological limitations stem from categorisation simplifications. While our sample included practitioners from diverse meditation backgrounds, limited representation required broad secular/non-secular categorisation, potentially obscuring theoretically significant distinctions between traditions. Similarly, our discrete categorisation of meditation experience and psychedelic use may have masked complex relationships that continuous measures could better capture in future research. The undifferentiated treatment of psychedelic substances and dosages also warrants more nuanced investigation, as different compounds may interact uniquely with specific meditation practices. Future studies should stratify analyses by tradition, substance type, and dosage while developing more precise phenomenological classifications of meditation [64] to better understand how specific meditative qualities interact with psychedelic states.

A fundamental limitation of the current study concerns our participant selection criteria, which required experience with both practices. This likely introduced sampling bias toward individuals predisposed to viewing meditation and psychedelics as complementary, excluding perspectives from practitioners who maintain their separation or oppose their integration. This bias is particularly significant given the diversity of traditional views: while some shamanic and indigenous traditions integrate psychedelics into contemplative practice, many orthodox Buddhist and Hindu schools explicitly discourage the use of psychedelics, viewing them as obstacles to spiritual progress. This tension between tradition and innovation presents a crucial challenge for developing psychedelic preparation protocols. Traditional meditation systems, like indigenous psychedelic practices, are deeply rooted in cultural and spiritual frameworks that resist simple secular translation [230, 231]. While meditation has demonstrated adaptability to Western therapeutic paradigms, developing preparation protocols requires a rigorous approach that preserves contemplative depth while ensuring cultural sensitivity and therapeutic accessibility.

The high rating of LKM points to a specific limitation in our approach to measuring meditation practices. While our study focused on LKM individually, contemplative traditions often present compassion-based practices as part of integrated systems that include various complementary attitudes and qualities. For example, some traditional frameworks cultivate loving-kindness alongside compassion, sympathetic joy, and equanimity, recognising how these qualities balance and support each other - loving-kindness balanced by equanimity prevents attachment, while compassion paired with joy helps prevent empathic distress. Future research should examine these practices as interconnected systems rather than in isolation, while

also investigating their neurobiological correlates in psychedelic contexts - particularly how specific meditative states might interact with psychedelic-induced brain states. This more comprehensive approach could illuminate how diverse contemplative wisdom traditions might optimally support the emerging field of psychedelic therapy while respecting both empirical rigour and cultural authenticity.

The high rating of LKM points to a specific limitation in our approach to measuring meditation practices. While our study focused on LKM individually, which in its contemporary form draws some inspiration from Theravada Buddhist *mettā* practice, compassion-based practices more broadly exist within integrated systems across many contemplative traditions [232-234]. These traditions often emphasise how different aspects of contemplative practice can complement and balance each other - for instance, how qualities of kindness might be balanced with equanimity, or how compassion might be supported by cultivating joy to prevent emotional fatigue. Future research should examine these practices as interconnected systems rather than in isolation, while also investigating their neurobiological correlates in psychedelic contexts - particularly how specific meditative states might interact with psychedelic-induced brain states. This more comprehensive approach could illuminate how diverse contemplative wisdom traditions might optimally support the emerging field of psychedelic therapy while respecting both empirical rigour and cultural authenticity.

Conclusion

This cross-sectional investigation of practitioners with both meditation and psychedelic experience reveals a convergent pattern across multiple measures that points to adaptive affect navigation as a central mechanism for both harm reduction and benefit enhancement in psychedelic contexts. This finding emerges consistently through several lines of evidence: the high endorsement of LKM over concentration-based practices, the primacy of the PES factor in our analysis of meditative elements, and the elevated ratings for emotion regulation processes over attention control. The emphasis on psychological flexibility and emotional resilience is further supported by practitioners' high valuation of elements like 'sense of humour' and 'comfort with discomfort', suggesting that successful psychedelic experiences may depend more on the capacity to navigate emotional states fluidly than on maintaining rigid attentional focus. These insights, derived from the complex interplay of meditation experience, tradition adherence, and psychedelic use, provide empirically grounded parameters for developing preparatory protocols, including specific recommendations for scalable online delivery formats. As both meditation and psychedelic research advance into their third wave of scientific investigation [56], this mechanistic understanding of affect navigation as a key preparatory element offers valuable guidance for optimising psychedelic-assisted therapies while enhancing our broader understanding of consciousness modification for therapeutic benefit.

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