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ORIGINAL PAPER

Altered States of Consciousness are Prevalent and Insufficiently Supported Clinically: A Population Survey

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Abstract

Objectives Adoption of potentially consciousness-altering practices may be leading to a rise in emergent phenomena (EP): sudden unusual mental or somatic experiences often interpreted as spiritual, mystical, energetic, or magical in nature. It is unclear how frequently these altered states of consciousness occur and what the clinical implications may be. Anecdotal accounts and prior literature suggest that EP may be common, under-reported, and followed by either positive or negative changes to well-being. We sought to supplement prior evidence on the prevalence and effects of EP among general populations with large-scale quantitative measurements.

Method We measured the prevalence of EP, while not on mind-altering substances, through completion of online surveys by representative samples from three international communities ($n = 3135$). The communities sampled were UK Qualtrics online panelists, US-based MTurk workers, and the readers of a popular rationalist blog. Samples were broadly representative of underlying populations.

Results Forty-five percent of participants reported experiencing non-pharmacologically induced EP at least once in their lives, including derealization (17%), unitive experiences (15%), ecstatic thrills (15%), vivid perceptions (11%), changes in perceived size (10%), bodily heat or electricity (9%), out-of-body experiences (8%), and perception of non-physical lights (5%). Respondents reported a mix of positive and negative well-being outcomes following EP, with 13% claiming moderate or greater suffering and 1.1% claiming life-threatening suffering. Of those who experienced suffering, 63% did not seek help.

Conclusions EP are widespread among the studied populations with potential for both positive and negative outcomes, the latter of which do not appear to be adequately addressed through recourse to clinical practice.

Keywords Altered states of consciousness · Contemplative practice · Emergent phenomena · Meditation · Mental health · Mindfulness · Mystical experience

Contemplative practices such as yoga, meditation, and mindfulness-based interventions (MBIs) are gaining global popularity for their potential to enhance well-being, productivity, job performance, and pro-social behaviors (Masci & Hackett, 2018). Buddhist-derived practices such as MBIs are applied to promote mental and physical health (Galante et al., 2021; Strohmaier, 2020), and utilized in therapeutic and clinical settings for the management of stress (Garland et al., 2017), anxiety (Goldberg et al., 2018), substance misuse (Garland et al., 2022; Li et al., 2017; Parisi et al., 2022), mood and psychiatric disorders (Goldberg et al., 2018, 2019; Kuyken et al., 2016; Wielgosz et al., 2019), and physical ailments such as chronic pain (Brintz et al., 2020; Hilton et al., 2017).

As mindfulness-based practices are thought to improve resilience, cognitive ability, and emotional regulation (Gill et al., 2020; Guendelman et al., 2017; Roeser et al., 2022), they are applied in the education system (Dunning et al.,

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2022; Tudor et al., 2022), prisons (Bouw et al., 2019), and the military (Zanesco et al., 2019). They are also considered effective tools for corporate well-being (Van Dam et al., 2018; Vonderlin et al., 2020), with one survey finding that 52% of 163 evaluated companies offered mindfulness training that year (Lau, 2020). Mobile applications and websites delivering mindfulness-based practices are popular (Cavanagh et al., 2013; Sommers-Spijkerman et al., 2021), with an estimated 52 million meditation app downloads in 2019 and projected revenue of 6.7 billion dollars by 2026 for mobile apps alone (Williams, 2020).

However, MBIs and other mindfulness-based practices draw on contemplative traditions that seek to produce not just enhanced well-being, but also altered states of consciousness — including transformative experiences — to trigger enduring changes in an individual's sense of self and the world around them (Taylor & Egeto-Szabo, 2017). These transformations are often associated with a type of altered state of consciousness we characterize as emergent phenomena (EP): sudden unusual mental or somatic experiences often interpreted as spiritual, mystical, energetic, or magical in nature. The cognitive and behavioral shifts associated with EP may include a decreased fear of death, diminished interest in dogma and traditional religion, and a rejection of materialistic lifestyles (Griffiths et al., 2018; Johnson et al., 2019; McClintock et al., 2016; McGee, 2020), as well as a profound sense of connection; elevated mood; awe, reverence, and wonder; deep states of peace and equanimity; enhanced philosophical insight; creativity and problem-solving; and appreciation of ineffability and paradoxicality (Corneille & Luke, 2021; Hood, 1975; James, 1983 [1902]; Stace, 1960). These shifts are occasionally characterized by a sense of dissolution of past conditioning including existing beliefs and attitudes; a feeling of resetting the mind (sometimes interpreted as a "rebirth"); increased curiosity and gratitude towards life; and a newfound sense of purpose or calling to altruistically serve humanity. Such events are also believed to enhance and promote pro-social and pro-environmental behaviors such as empathy, compassion, gratitude, and nature connection (Harrild & Luke, 2020; McClintock et al., 2016), as well as healthier lifestyle choices, which in turn have been shown to improve mental and physical health (Woollacott et al., 2020). Endogenous mystical experiences are also linked to sustained improvements in treatment-resistant substance abuse (McGee, 2020). Transformative experiences may be preceded by psychological turmoil and trauma, sleep deprivation or starvation, or direct practice of specific activities — although the effect may not always be anticipated by the practitioner. They can also occur spontaneously, without any discernible trigger and so are not restricted to meditative settings (Corneille & Luke, 2021).

EP are also associated with challenging experiences, including increased awareness of unpleasant sensations or emotions, and difficulty dealing with disruption to established modes of perception and thought. Individuals may experience heightened sensitivity and porosity (Luhrmann et al., 2021) making them prone to report paranormal phenomena or perceived extra-sensory perception (ESP) occasionally manifesting as the sudden onset of hearing voices or feeling malicious non-sensory presences (Greyson, 2000; Grof, 2019). Perceptual and emotional processing may change drastically and thought processes may quicken or slow-down (Ingram, 2018). Such intense cognitive shifts may leave the experiencer in a state of disarray, confusion, or overwhelm, due to their existing worldviews being altered (Grof, 2019). EP can also be associated with powerful energetic or physical effects such as shaking, trembling, involuntary positionings and contortions, electric sensations, and temperature changes in the body (Lindahl et al., 2017; Woollacott et al., 2020) and these occurrences sometimes negatively impact the overall view of the experience. Consequently, distress and impairment can arise during an EP episode or afterwards as individuals attempt to cognitively interpret their experiences (Grof & Grof, 1989, 2017; Lukoff & Everest, 1985).

While contemplative traditions are often explicit about the possibility of negative effects from EP, numerous studies examining the effects of contemplative practices have been criticized for adopting methodologies prone to report positively biased results (Lutkajtis, 2018; Van Dam et al., 2018). However, in recent times, an increasing number of studies have attempted to actively assess adverse side effects from mindfulness-based interventions. Britton et al. (2021) found meditation practice in mindfulness-based programs was associated with transient distress and negative impacts at similar rates to other psychological treatments. Francis et al. (2022) found 19 (31%) of their participants responded "yes" to the question on "unexpected, challenging, or difficult experiences that you associate with your practice of meditation." Recent systematic reviews have revealed the total prevalence of adverse events in studies of meditation practice to be 8.3% (Farias et al., 2020) and found that nearly all studies of meditation interventions or mind-body practices report some form of mental distress and less commonly somatic distress (Taylor et al., 2022).

Should the side effects of EP become distressing or impair everyday functioning, they are referred to in transpersonal psychology literature as spiritual emergencies or crises (Grof & Grof, 1989). Activism from transpersonal psychologists in the 1980s and 1990s sought to distinguish spiritual crises from psychopathology, resulting in the introduction of the *Religious or Spiritual Problem* diagnostic category in the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders in 1994 (DSM-IV; American Psychiatric Association, 1994; Lukoff, 1985). However, modifications to the initial proposal excluded experiences

outside a religious context (Turner et al., 1995). This exclusion renders the category incomplete, given that negatively valenced EP may occur more frequently in cases where the experiencer does not have a religious or cultural structure to assist in the interpretation of their experience (St Arnaud & Cormier, 2017; Taylor, 2013). Despite studies addressing the limitations of DSM categorization (Harris et al., 2019; Menezes & Moreira-Almeida, 2010; Parnas & Henriksen, 2016; Rock & Clark, 2015), the *Religious or Spiritual Problem* diagnostic category remains virtually unchanged (DSM-5; American Psychiatric Association, 2013). Further, while the DSM-5 covers adverse side effects requiring immediate treatment, such as dissociation and depersonalization, other non-acute yet possibly equally distressing challenging effects are omitted (Lindahl et al., 2017).

Accounts of individuals seeking help from established healthcare systems suggest that, despite the updates to the DSM, clinicians are not equipped with appropriate knowledge and training to assist individuals who experience EP (Grof & Grof, 2017). Although presentations of EP are acknowledged in many contemplative, spiritual, religious, and cultural traditions, and often regarded as goals, gifts, or signposts of being on the "right path" (Buddhaghosa, 2010; Sobhana, 1994; Wallace, 2011), mainstream psychology and psychiatry typically view more extreme challenging EP as symptomatic of mental disorder *by default* (Blom, 2013; Menezes & Moreira-Almeida, 2010; Parnas & Henriksen, 2016). Although such a diagnosis may at times be accurate, a lack of empirical data on the varieties and outcomes of EP, and their overlaps with psychosis-inducing disorders such as schizophrenia and bipolar disorder, makes it difficult to identify the extent to which current diagnostic strategies are appropriate.

Further, regardless of whether those experiencing EP perceive them as positive or negative, fears of being misunderstood, having one's experiences invalidated, being considered unstable, being diagnosed with a psychiatric disorder, or being medicalized against one's will, are not uncommon (Cardeña et al., 2000). For these reasons, EP and particularly negatively valenced EP are under-reported both in clinical practice and in society more broadly (Lindahl et al., 2017). Yet, early identification of potentially challenging effects from EP is important for the mitigation of spiritual crisis (Shimokawa et al., 2010) and for the successful cognitive interpretation and integration of the EP (Parker, 2018). Access to peer support and coherence between clinical responses and the experiencer's interpretive frameworks may also play a role in successful integration of the EP (VanderKooi, 1997).

Thus, with the growth of the multibillion-dollar meditation industry, increases in engagement with meditation practices worldwide (Wieczner, 2016), and growing interest in advanced meditation including meditative development and meditative endpoints (Galante et al., 2023; Sparby & Sacchet, 2022; Wright et al., 2023), EP are likely to become more widely experienced and consequently more frequently encountered in clinical settings. An understanding of the prevalence and outcomes of EP among both meditating and non-meditating members of the general population is becoming an increasingly important matter. The potential benefits of EP, coupled with potential dangers, highlight the necessity for a sophisticated, detailed, and more complete understanding of such phenomena. From both ethical and medical standpoints, it is thereby crucial to address (a) whether such phenomena are widespread; (b) which are most common; (c) the balance of positive versus negative consequences; and (d) whether and where those struggling with EP seek help. These questions and expectations were assessed in the present, exploratory, study of the occurrence of EP among general populations.

Our expectation was that EP would be present both among meditators and non-meditators in the general population, that it would be of the types described in contemplative practice manuals, that EP would have the potential to lead to both positive and negative changes to well-being, including the types of suffering described in Buddhist traditions (e.g., the *Dukkha nanas*; Ingram, 2018).

Method

Participants

Participants were recruited from two commercial survey panels (US MTurk and UK Qualtrics) and one online community (subscribers to a popular Rationalist blog). MTurk provided a convenience sampling approach to evaluate performance of the instrument developed for this study. Qualtrics is a reputable commercial survey panel known to offer a large pool of respondents representative of the UK population. Access to the Rationalist blog readers presented an opportunity to gather additional data from a more homogenous population known to take a skeptical approach to meditative experiences. Purposive selection of three diverse populations across two countries ensured main results would be robust to sampling frame bias.

Permissions to recruit participants were sought and granted prior to the commencement of the study. All participants were over 18 years of age. Participation was voluntary. A total of 3135 participants provided valid responses to the survey (UK Qualtrics: $n = 1130$; US MTurk: $n = 351$; Rationalist blog: $n = 1654$). The UK Qualtrics and US MTurk samples were reasonably representative of the age groups, genders, and ethnicities of the sampled populations. The MTurk data oversampled the 35–54 group compared to the 55 + age group, and undersampled Hispanic/Latino ethnicities compared to the White ethnicity. There is otherwise

Table 1 Participant demographics. All values indicate percentage of the given cohort. Figures in parenthesis are comparators drawn from census.gov, gov.uk, and scotlandcensus.gov.uk for Qualtrics; data.census.gov for MTurk; and subscriber base demographics for the Rationalist blog. Age comparators are percentages of those 18+. US ethnicity data is calculated as % of all reported ethnicities

		Qualtrics $n=1130$ %	MTurk $n=351$ %	Rtnl. blog $n=1654$ %
Age	18–34	32 (28)	22 (29)	57 (59)
	35–54	33 (32)	56 (32)	36 (33)
	55+	35 (40)	22 (38)	7 (7)
Gender	Male	47 (50)	50 (50)	83 (85)
	Female	52 (50)	50 (50)	11 (11)
	GNB/other	0.4 (*)	0.3 (*)	6 (5)
Ethnicity	White	82 (83)	79 (66)	91 (86)
	Asian	9 (9)	7 (7)	6 (5)
	Black	6 (4)	8 (13)	1 (0.03)
	Hispanic/Latino	*	3 (14)	2 (2)
	Other	3 (5)	3 (1)	4 (6)

*Not measured

no indication of response bias from these demographic data. Although the Rationalist blog readers had distinctive demographic skews compared to the other two populations, these closely reflected the underlying blog readership demographics (Table 1) .

UK Qualtrics and US MTurk data included geospatial locations for response completion. Plots of these locations (Supplementary Information Figure S1) demonstrate the samples are geographically distributed as would be expected from representative surveys. There is therefore no indication of response bias from survey location.

Past diagnoses of mental illness were relatively common within our samples, having been received by 36% of respondents across all three samples. This proportion is consistent with other estimates of the lifetime prevalence of mental disorders. For example, while 47% of individuals in the USA are reported to experience mental illness during their lifetime (Kessler et al., 2009), for 25% of these people, onset of mental illness occurs after the age of 24 (National Alliance on Mental Illness, n.d.). Combined, these results suggest the proportion of our sample who have had a diagnosis of mental illness is a reasonable approximation of population averages, and there is no evidence of disproportionate responding from those with a past diagnosis of mental illness.

Procedures

Qualtrics panelists were invited to participate with the message: "Congratulations! You have been selected, you have x surveys available, you can earn up to $x." MTurk workers were invited to participate in a survey that would ask whether they had a spiritual or meditative practice and also about their well-being. Recruitment of Qualtrics panelists and MTurk workers followed the standard practice of issuing invitations and accepting responses until demographic quotas and sample size requirements were met. The Rationalist blog readers were invited to participate in 25 surveys of which the 7th was "Meditative Experiences." The "Meditative Experiences" survey was completed as an independent task that did not include questions from any of the other 24 surveys, thereby minimizing context effects. All invitations required adult participants and responses were screened to ensure this criterion was met. An information sheet was used to address ethical requirements and introduce the survey topic.

Although the study was not expected to involve any obvious risks, helplines were provided for participants who continued to be affected by past related unpleasant experiences. Participants were informed that participation was voluntary and anonymous, that they could omit answering any question, and were given the option to withdraw from participation prior to submission of the questionnaire. Anonymity was maintained throughout the study and raw data stored on a password-secured computer. The information sheet also sought to reduce selection bias for all three surveys by stating:

> *Many people report unusual mental phenomena that have a spiritual or mystical component. Almost half of US adults (49%) report having had a 'sudden religious insight or moment of awakening'. A similar number (46%) experience mental health challenges during their lifetime. Very little is known about the relationship between unusual mental phenomena, mental health, and well-being. To find out more, we are asking a range of people about their spiritual or meditative practices and their experience of unusual mental phenomena. We hope you will answer the survey to help us better understand these widespread human experiences.*

The same survey was applied to all three populations subject to minor variations in survey logic and question stem wording to reflect unique characteristics of each population and apply lessons learned from prior implementation. For the commercial panels, the survey was implemented using Qualtrics survey software with pre-testing followed by the main survey. For the Rationalist blog, the survey was implemented by the blog host (including all ethical requirements).

Measures

To investigate the prevalence and effects of EP in general populations, we assembled an interdisciplinary team to develop a suitable survey instrument using a quantitative self-report questioning approach. The team included professional expertise in emergency medicine, psychiatry, public health, epidemiology, neuroscience, advanced meditative research and practice, and survey research. We judged extant multi-item scales in the domain of EP unsuitable for this study and so developed a new questioning strategy to elicit reports of the occurrence of EP, well-being outcomes, assistance sought for negatively valenced EP, and potential covariates to be investigated in future research.

Instrument development employed a process similar to the Delphi method, modified to suit the context of our study. The interdisciplinary team acted as a panel of experts who iteratively contributed their insights through multiple rounds of refinement. Unlike the traditional Delphi method, our process did not maintain anonymity of panel members, focusing instead on collaborative discussion to achieve consensus on the design of the instrument.

Within the instrument, the questioning approach was to obtain direct recall of personally experienced events. This was informed by advanced questionnaire design principles (Labaw, 1982; Gendall, 1998; Holdershaw et al., 2003), including asking questions that respondents could answer with sincerity, and Rossiter's (2011) advocacy for single-item measures when both object and attribute under question are concrete to respondents. To facilitate unambiguous recall and reporting, we avoided abstract terminology in favor of questions that were grounded in the specific, describable aspects of meditative experiences. We also employed ontologically neutral language able to accommodate a wide range of contemplative, spiritual, religious, and existential perspectives.

Survey questions typically began with a stem introducing the personal characteristic or experience, followed by a pre-determined list of single-item measures of alternative outcomes or events that may have been experienced, from which respondents could select as many as applied. An "other" category and free text box were provided to capture responses that fell outside the pre-determined options. Specific details of individual question wording are presented throughout the Results section.

The final instrument underwent multiple rounds of pre-testing, including evaluations by the authorship team, local postgraduate students, a sample of 30 MTurk workers (excluded from the final study sample), and through technical pretests on the MTurk and Qualtrics platforms to ensure survey functionality. Continuous minor emendations were made between studies to reflect lessons learned from each implementation and to tailor question wording to suit target populations more effectively.

Data Analyses

Data was cleaned to remove duplicate, incomplete, and inattentive responses, and to harmonize skip logic between implementations. Cleaning and analysis were undertaken using Microsoft Excel and IBM SPSS software packages.

Given the exploratory nature of this work, analysis was restricted to reporting and comparisons of population estimates, with uncertainty quantified through summarized reporting of the standard errors present in each table. Chi-square analysis is also employed in one instance to determine the significance of the association between suffering and mental illness.

More extensive reporting of statistical tests for all questions across all surveys would run a significant risk of type 1 errors. This risk could be addressed by making a Bonferroni correction to critical values for the statistical tests; however, determining the numerator of the Bonferroni correction would require assumptions about which tests to include to determine the quantum of correction. Thus, unlike the reporting of standard errors, more extensive statistical testing would in this case would not be independent of the assumptions of the analyst.

Results

"Supernatural" and "Miraculous" Events

Contemplative practice manuals record many types of EP and describe their phenomenology in some detail. However, for those unfamiliar with contemplative traditions, EP are sometimes interpreted as "supernatural" or "miraculous" events. We therefore first asked: "Have you ever, while not on mind-altering substances, had supernatural experiences that you believe ordinary science could not explain, appearing to be 'miraculous,' 'magical,' or 'psychic'." (UK Qualtrics and US MTurk), and "Have you ever, while not on mind-altering substances, had any supernatural experiences such that you believe the ordinary laws of physics could not explain, so they appear to be 'miraculous,' 'magical,' or 'psychic'?" (Rationalist blog). The question stem was slightly altered between surveys to reflect wording most likely to be used by the sampled population.

Twenty-six percent of all respondents reported such experiences. The UK Qualtrics group displayed a higher prevalence of reports (39%), compared to the US MTurk group (26%) and Rationalist blog group (18%) —— with 13% of the UK Qualtrics group reporting precognitive experiences ("inexplicable knowledge of something that had not yet happened"), 11% reporting having had visions of other beings ("… such as angels, demons, djinni, spirits or ghosts"), and 6% reporting out-of-body experiences ("the experience of leaving my body behind to travel to

some other place"). The most common reports overall across the three cohorts were forms of precognitive knowledge (10%), followed by visions of other beings (7%), knowledge of distant events (6%), and knowledge of others' thoughts (6%). The least commonly reported experience was the ability to move objects without touching them (1%). Detailed results are provided in Supplementary Information Table S1.

Sudden Unusual Mental Events

We next asked about EP using the descriptions developed by the expert panel. The question stem was: "Have you ever, while not on any mind-altering substances, had sudden unusual mental events that involved strange changes in perception, or ecstatic pleasurable feelings?" This was followed by presentation of a range of pre-determined answer categories. Forty-five percent of all participants reported of all participants reported experiencing such sudden unusual mental events. Symptoms of derealization ("had the sense that everything was unreal, like a dream or a cartoon") were most reported, closely followed by both "unexpectedly experienced a strong sense of oneness with the world, or with God" and "unexpectedly felt strong ecstatic thrills running through my body", and then "unexpectedly experienced a strong sense of vivid brightness and clarity in sensation." Least commonly reported was the experience of "lost consciousness in the midst of a meditative or spiritual experience." Although the rationalist blog group had reported fewer supernatural experiences, they reported more sudden unusual mental events (52%) compared to both other groups (UK Qualtrics: 38%; US MTurk: 33%) (Table 2: see the table legend for standard errors).

Respondent Perception of Long-Term Changes to Well-Being

The expectations of the expert panel were that positively perceived events would be more likely to have positive impacts on well-being and negatively perceived events would be more likely to have negative impacts, but that impacts on well-being may occasionally have the opposite valence to EP due to complexities in integrating the experience. The relationship between EP, perceived valence of the experience, and longer-term changes to well-being is therefore complex, so we adopted a multi-part questioning strategy to investigate these effects. First, participants were asked about their experience with sudden unusual mental events, as reported above. Then, they were asked whether some of the events they had experienced (if any) were perceived positively, for which they were instructed to select from a list of positive terms used by a variety of traditions to describe EP. The question was as follows: "Sometimes these unusual mental events are seen in positive or transformative terms, even if they weren't all that pleasant at the time - Which of these positive terms (or their very near equivalents) have you ever thought might reasonably apply to what was going on with you?". The outcomes were measured through the question: "If you have experienced any of these unusual positive mental events, did you notice any longer-term change to your wellbeing afterwards?"

Table 2 Participants who had experienced sudden unusual mental events. All values indicate percentage of the given cohort. Maximum standard error is 1 percentage point for the UK Qualtrics and Rationalist blog respondents (0.014/0.012, respectively), and 3 percentage points for the US MTurk respondents (0.025)

	Qualtrics $n=1130$ %	MTurk $n=351$ %	Rtnl. blog $n=1654$ %	All $n=3135$ %
I have never had such experiences	62	67	48	**55**
Had the sense that everything was unreal, like a dream or a cartoon	11	11	22	**17**
Unexpectedly experienced a strong sense of oneness with the world, or with God	7	13	21	**15**
Unexpectedly felt strong ecstatic thrills running through my body	7	7	22	**15**
Unexpectedly experienced a strong sense of vivid brightness and clarity in sensation	6	7	16	**11**
Felt that everything else was very small, or that I was very big	6	6	13	**10**
Felt heat or electricity rise in my body	8	7	10	**9**
Had my point of view suddenly shift out of my body to different perspective	6	5	9	**8**
Saw bright lights that were not physically present	6	6	5	**5**
Had some of my sensory input turn into discrete rapidly strobing frames	3	1	4	**3**
Lost consciousness in the midst of a meditative or spiritual experience	3	2	2	**2**
Yes, something else	4	3	6	**5**
Saw sacred geometric patterns that were not physically present	*	*	4	*

*Not measured

with options to select varying degrees of positivity and negativity. A nearly identical series of questions followed, adapted for negatively perceived events. In both cases, respondents who had experienced multiple such events were invited to select all answer categories that applied. The results therefore report numbers of event outcomes rather than the number of respondents (Table 3: see the table legend for standard errors).

Over all types of outcomes reported across all three surveys, in 30% of cases respondent did not notice any changes after the sudden unusual mental event, in 28% of cases respondents noticed negative outcomes, and in 40% of cases respondents noted positive outcomes. Those who experienced positive events mostly associated these with positive outcomes (55%) and those who experienced negative events mostly associated these with negative outcomes (48%). Some from each group reported that they did not notice any changes (27% and 36%, respectively). However, a smaller proportion associated events with oppositely valenced outcomes, namely negative outcomes for 15% of positively valenced events and positive outcomes for 14% of negatively valenced events (Table 3).

The results suggest that positively perceived events are more likely to lead to positive changes to well-being, while negatively perceived events are more likely to lead to negative changes to well-being (Table 3). However, this relationship is not determinative; that is, either type of event (positive or negative) could lead to either type of outcome (positive or negative).

Types of Negative Experiences

Respondents were asked "If you suffered from unpleasant emotions, thinking or physical pain after an unusual mental event, what kind of experiences were associated with your suffering. Please select all that apply." Responses were invited according to an inventory of nine common forms of suffering derived from contemplative practice manuals and the expertise of the expert panel.

Of all responses, most reported were "Feelings of misery, sadness, or disgust with my life", followed by "A disturbing sense that the world is nothing but a dream or cartoon". Least commonly reported were "Painful sensations of pins and needles in the body, head, or face". One percent of all respondents selected "Something else" (Rationalist blog) or "Some other type of experience" (Qualtrics and MTurk) indicating the accuracy of the standard descriptions of suffering drawn from contemplative practice manuals (Table 4: see the table legend for standard errors).

Intensity of Worst Suffering

Respondents were asked, "How intense was the worst of these experiences?" In total, 18% of the total sample ($n = 3135$) reported some degree of intensity of suffering with 6% reporting mildly intense suffering, 8% reporting moderately intense suffering, and 4% reporting severely intense suffering. A further 34 respondents (1.1% of the combined sample) reported that the suffering was life-threateningly intense.

Association with Mental Illness

Respondents were asked "*Has a physician or mental health professional ever diagnosed you as having any type of mental illness, such as an anxiety disorder, depression, bipolar disorder, psychosis, schizophrenia or similar, or prescribed you medication for any type of mental illness?*" For those who experienced moderately intense, severely intense, or life-threateningly intense suffering, 57% reported a diagnosis of mental illness and 43% did not. The association between

Table 3 Long-term changes to well-being. All values indicate percentage of the given cohort. Maximum standard error is 1 percentage point (0.01) across all cell entries

	After events perceived as positive $n = 1453$ %	After events perceived as negative $n = 901$ %	After both types of events $n = 2354$ %
Did not notice any changes	27	36	30
Temporary minor negativity	9	25	15
Temporary major negativity	3	14	8
Enduring negativity	3	9	5
Temporary minor positivity	24	5	17
Temporary major positivity	14	4	10
Enduring positivity	18	5	13
Some other change	2	2	1
Total for negativity	**15**	**48**	**28**
Total for positivity	**55**	**14**	**40**

Table 4 Types of negative experiences. All values indicate percentage of the given cohort. Maximum standard error is 1 percentage point across all cell entries (0.012)

	Qualtrics $n=1130$ %	MTurk $n=351$ %	Rtnl. blog $n=1654$ %	All $n=3135$ %
Feelings of misery, sadness or disgust with my life	8	4	11	**9**
Obsessive thinking about problems and how they might be solved, or corrected	7	5	7	**7**
Feelings of nausea, fear or terror about physical or supernatural surroundings	5	3	6	**5**
Disenchantment, irritability or desire to change things I previously enjoyed	4	2	7	**5**
A disturbing sense that the world is nothing but a dream or a cartoon	5	3	6	**5**
A disturbing sense that I no longer exist as a person	5	1	4	**4**
Rapid cycling between negative and positive emotions and thoughts	4	4	3	**4**
Painful sensations or pins and needles, or burning, in the body, head or face	4	2	2	**3**
Something else/ Some other type of experience	1	1	2	**1**

a diagnosis of mental illness and greater suffering was significant ($\chi^2(4, n=617)=22, p<0.001$).

Seeking Help After Negative Experiences

Respondents were asked if they sought help for their negatively perceived events. A majority of those who reported any degree of suffering did not seek help (63%). Of those who had negatively perceived events, 15% sought help from generalist healthcare providers, 13% from family or friends, 12% from experts in meditation or spiritual practices, and 8% from specialist healthcare providers. Note this answer category allows multiple answer responses.

Despite widespread prevalence of suffering after unusual mental events, only 47% of all respondents (32% UK Qualtrics, 25% US MTurk, 62% Rationalist blog) had heard of the "risks of challenging negative emotional, cognitive or physical outcomes from meditation or spiritual practice" (rationalist blog) or "unpleasant emotions or thinking, or physical pain, arising from spiritual or meditative practice" (US MTurk and UK Qualtrics) prior to the completion of the survey. For the group who experienced suffering following EP, 29% still reported that they had not heard of these risks prior to completion of the survey (29% for those experiencing moderately intense suffering, 29% for those experiencing severely intense suffering, and 26% for those experiencing life-threateningly intense suffering).

Discussion

We were concerned to know whether EP were widespread, which were most common, the balance between positive versus negative consequences; and whether and where those struggling with EP sought help. We found 45% of participants reported experiencing non-pharmacologically induced EP at least once in their lives, including derealization (17%), unitive experiences (15%), ecstatic thrills (15%), vivid perceptions (11%), changes in perceived size (10%), bodily heat or electricity (9%), out-of-body experiences (8%), and perception of non-physical lights (5%). Respondents reported a mix of positive and negative well-being outcomes following EP, with 13% claiming moderate or greater suffering and 1.1% claiming life-threatening suffering. Of those who experienced suffering, 63% did not seek help.

Experts working with meditation and its modern derivatives may already recognize the potential for EP to emerge from certain specialized contemplative practices (or from psychedelic use). Nonetheless, EP continue to be underreported in clinical settings (Lindahl et al., 2017) with evidence suggesting clinicians are not adequately prepared to assist individuals who experience EP (Grof & Grof, 2017), with deeply unsettling experiences of EP tending to be pathologized by default (Parnas & Henriksen, 2016). These issues are reflected in the content of the DSM-5, and in the general expectation that adverse side effects of EP will only rarely present in modern mental and medical healthcare systems, and that they are more likely to occur in a small minority of individuals with significant comorbidities such as psychosis, schizophrenia, bipolar, or schizotypal personality disorder, or because of psychosis-mimicking substance abuse.

Contrary to these views, our expectation was that unwanted EP would constitute a risk for those engaging in modern mindfulness-based practices drawn from contemplative traditions, and that this risk may be reflected in some occurrence of EP among the general population. The use of mindfulness has increased from 2.5% of adults in the United States in 2012 to 5% of adults in 2017 (Simonsson et al., 2020a) and has been estimated to be 15% of adults in the United Kingdom (Simonsson et al., 2020b). We were surprised to find evidence that EP was in fact even more widespread than mindfulness practices.

Of all the participants who took part in this study, nearly half reported experiencing sudden unusual mental events at some point in their lives while not under the influence of mind-altering substances. Further, over one-quarter of the total number of participants additionally reported non-pharmacologically induced supernatural experiences.

Given the widespread occurrence of EP, it is important to understand the subsequent impact on well-being. Previous studies observing endogenously occurring mystical experiences (a subset of EP focused on positive events) have reported predominantly positive long-term increases in overall physical and mental well-being following an event (Corneille & Luke, 2021; Taylor & Egeto-Szabo, 2017). Other studies have reported adverse effects among meditators (e.g., Farias et al., 2020; Goldberg et al., 2022) but did not examine the variety of EP-related events among the general population uncovered by our surveys. In our research, when participants were asked whether EP was followed by longer-term changes to well-being, most reported positive changes, followed next in frequency by no perceived longer-term impact; however, a substantial proportion of respondents reported negative effects. Strikingly, over the whole sample, almost one-fifth of respondents reported experiences of suffering following EP, and almost one-eighth of the whole sample reported suffering that was moderately intense or worse. Despite it being the least reported intensity of suffering, 1 in 100 people believed they had survived a life-threatening experience of suffering following EP. While well-being outcomes were largely aligned with the initial valence of the EP event, a minority of participants reported an oppositely valenced effect, consistent with the expectations of the expert panel. These findings suggest that suffering following the occurrence of EP, of the types recorded in contemplative traditions, is already a significant public health issue, despite the relative lack of clinical attention to these effects.

The results also raise the question of what makes EP outcomes vary so greatly. The vast spectrum of types of EP makes it challenging to accurately determine which practices are more conducive to positive or negative results and why such a variety of outcomes do occur. To document all the different types of EP and their possible outcomes is beyond the scope of the present study; however, as EP has the potential to catalyze important transformation (whether negative or positive), the mental and medical health community ought to seriously consider the best and most appropriate ways to support individuals through all types of EP, to ensure the best possible outcomes for well-being.

In considering the response of participants to EP, we found that of those who had experienced negative mental events 63% did not seek help. A significant implication is that those suffering from EP-related negative effects do not perceive clinicians as an appropriate source of assistance. The reluctance to seek help from those experiencing a negative consequence of EP may partly be due to uncertainty about what effective help may be available; however, it may also be partly due to the perceived potential for a controlling or repressive response (Grof & Grof, 2017). This perception may be substantiated. There are a lack of widely available diagnostic tools and treatment plans to support clinicians presented with adverse effects from EP (Lukoff et al., 1998), and indeed current emergency medicine textbooks contain minimal guidelines on treating EP (Tintinalli et al., 2016; Walls et al., 2021). Given the widespread and occasionally severe nature of negative effects related to EP, addressing this apparent neglect is crucial. Substantial work is needed to develop a body of research to support diagnosis and treatment of EP-related negative effects in clinical settings, as well as to communicate the results through relevant clinical textbooks, training programs, diagnostic manuals, and professional development. Properly understanding the long-term effects of EP and their role in meditative development will help ensure the best possible outcomes for individual and societal health.

With the use of EP-inducing practices and EP-inducing psychedelics increasing, the prevalence of clinical presentation of EP might be expected to increase, so there is potential for an increasing burden on clinicians and healthcare systems from these practices. Also, more positively, there is potential to move beyond use of contemplative practices and psychedelics simply for emotional regulation, to instead embrace achieving genuinely transformative experiences. Clinicians and emergency physicians, as well as holistic and well-being practitioners, should therefore become familiar with the spectrum and scale of EP and the associated effects. Without an appropriate and clear understanding of the high prevalence of these experiences, they are unlikely to be considered a clinical priority and will continue to be bracketed and treated within the pathological frame by default, even where other treatments may be more effective.

For those providing or promoting contemplative practices, whether through traditional retreats, personal instruction, mindfulness-based intervention, commercial apps, or informal groups, the principle of informed consent suggests that participants should receive information on the range of potential side effects of practice, along with advice for handling any negative or disorienting effects (Grabovac, 2015). Even positive experiences may cause significant personality, relationship, and life changes that may impact individuals in addition to the person who may have experienced EP (Ingram, 2018). Some organizations already offer services to address meditation-related negative effects, demonstrating both the need and the possibility of providing counselling to integrate challenging meditative experiences (American Center for the Integration of Spiritually Transformative Experiences; Cheetah House; Integrative Mental Health University; International Spiritual Emergence Network; Spiritual Crisis Network). Meditation providers should take

account of how to minimize negative effects that may arise from meditation programs, as failure to do so may not only cause harm for their clients, but open the door to potential legal concerns, jeopardize their social license to operate, and over time increase the risk of regulation. Research is also required into the causes and conditions of negative or disoriented effects, so that participant advice and support can be appropriately tailored to the techniques selected for practice (Galante et al., 2023).

Limitations and Future Research

A general limitation of the current study includes the reliance on self-recall, a method which is vulnerable to error. However, Griffiths et al. (2006) conducted a study on the reliability of recall of mystical experiences and found retrospective recall in this context is not as prone to error as in other contexts, perhaps due to the general subjective significance of these experiences.

While the single-item direct questioning approach adopted in this study is sufficient for obtaining population estimates of biographical events that can be concretely recalled, it may not be sufficient for clinical work. Here, multi-item scales might be necessary to enhance diagnostic confidence for individuals presenting with potential negative effects related to EP. We recognize the method adopted here as a limitation for clinical applications and propose this as an area for future development.

To better understand the extent and impact of EP, representative surveys should be conducted across additional countries and diverse ethnic communities. There also remains substantial potential to use survey data to examine EP and their outcomes in more detail, including differences in effects between specific contemplative techniques, as well as investigating how the experience of positively or negatively valenced EP affects the development of well-being over time.

As the proportion of the population who have undertaken MBI is increasing, it would be useful to include participation in MBI as a potential risk factor or moderator for EP, together with participants' broader contemplative practice history. However, given widespread occurrence of EP among the populations studied, contemplative practice histories alone are unlikely to be a sufficient explanandum of the effects observed. More comprehensive studies of epidemiological risk factors for EP are also required and could include consideration of associations with different types of mental illness, past trauma, psychedelic or other drug use, and other personal characteristics.

Using samples from opt-in internet panels may raise concerns about data quality. Studies have found that such panels are less accurate than probability samples obtained through random digit dialing, but more accurate than the convenience samples otherwise widely used in social science research (Berinsky et al., 2012). While concerns about data quality are increasing, particularly for MTurk (Douglas et al., 2023), evidence suggests that these panels continue to offer a useful resource for social science researchers and that some perceived disadvantages such as the presence of non-naive respondents may be overstated (Chandler & Shapiro, 2016; Goodman & Paolacci, 2017). It remains important to ensure sample diversity, perform unobtrusive attention checks, remove duplicate and inattentive responses, and to carefully evaluate data quality as has been done in the present study; however, given adherence to these disciplines, it is possible to have reasonable confidence in the resulting data. Nonetheless, data quality continues to improve with the emergence of newer providers, and evidence suggests the *Prolific* panel currently performs best (Douglas et al., 2023). Further replications of the present work could usefully draw data from that platform.

While our results demonstrate that respondents commonly attribute changes in well-being to the experience of EP, the use of self-reports nonetheless precludes rigorous consideration of the direction of causation. Prospective longitudinal studies of sufficient size and design are recommended to further explore questions of incidence, predisposing factors, causality, developmental trajectories, clinical patterns, and well-being implications. Importantly, we cannot at present rule out the possibility that both EP and health outcomes are commonly caused by some other unobserved factors.

Finally, further research could also contribute to better understanding of inter-population differences of the prevalence of EP, how EP is likely to be perceived, how EP affects well-being, and how the individual experience of EP may be integrated over time. As noted, religious or cultural structures may assist in the interpretation and integration of EP (St Arnaud & Cormier, 2017; Taylor, 2013). Further, certain indigenous communities may retain cultural traditions of the experience of EP that are unlike expectations to be found in other populations. Research into culturally-located traditions of EP may require qualitative or anthropological methods capable of more nuanced interpretation of the studied contexts than is achievable with a quantitative survey instrument.

While replication and extension of these initial findings is essential, we hope the results to date will provide guidance on the prevalence of EP as a "variant of normal", and encourage clinicians, physicians, and holistic and well-being practitioners to become aware of EP and to better consider how best to support those undergoing such experiences. We also hope to inspire experiencers to disclose their EP with more ease; however, this in turn relies on an open acknowledgement and understanding of EP in clinical practice. Such open acknowledgement is the first step to promoting

successful integration and well-being as outcomes of these consciousness-altering experiences.

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JG — conceptualization, methodology, writing — review and editing.

JSC — conceptualization, writing — original draft, writing — review and editing.

AG — conceptualization, methodology, writing — review and editing.

DI — conceptualization, data curation, funding acquisition, methodology, writing — review and editing.

MDS — conceptualization, methodology, supervision, writing — original draft, review and editing.

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Data Availability De-identified data will be made available once additional manuscripts, currently under preparation, are complete; in the interim, please contact the first author for data access. AI tools were not utilized in this study.

Declarations

Ethics Approval Approved by Massey University Human Ethics Committee (NOR 21/05).

Informed Consent Participants were briefed with an information sheet, informed that participation was voluntary and anonymous, that continuing the survey would indicate consent, that they could omit answering any question, and that they could withdraw from participation any time prior to submission of the questionnaire.

Conflict of Interest The authors declare no competing interests.

References

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders DSM-4*. American Psychiatric Association.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders DSM-5*. American Psychiatric Association.

Berinsky, A. J., Huber, G. A., & Lenz, G. S. (2012). Evaluating online labor markets for experimental research: Amazon.com's Mechanical Turk. *Political Analysis, 20*(3), 351–368. https://doi.org/10.1093/pan/mpr057

Blom, J. D. (2013). Hallucinations and other sensory deceptions in psychiatric disorders. In R. Jardri, A. Cachia, P. Thomas, & D. Pins (Eds.), *The neuroscience of hallucinations* (pp. 43–57). Springer.

Bouw, N., Huijbregts, S. C., Scholte, E., & Swaab, H. (2019). Mindfulness-based stress reduction in prison: Experiences of inmates, instructors, and prison staff. *International Journal of Offender Therapy and Comparative Criminology*, *63*(15–16), 2550–2571. https://doi.org/10.1177/0306624X19856232

Brintz, C. E., Roth, I., Faurot, K., Rao, S., & Gaylord, S. A. (2020). Feasibility and acceptability of an abbreviated, four-week mindfulness program for chronic pain management. *Pain Medicine*, *21*(11), 2799–2810. https://doi.org/10.1093/pm/pnaa208

Britton, W. B., Lindahl, J. R., Cooper, D. J., Canby, N. K., & Palitsky, R. (2021). Defining and measuring meditation-related adverse effects in mindfulness-based programs. *Clinical Psychological Science, 9*(6), 1185–1204. https://doi.org/10.1177/2167702621996340

Buddhaghosa, H. (2010). *The path of purification: Visuddhimaga* (H. Nyanamoli, Trans.). Buddhist Publication Society. (Original work published 5th century CE).

Cardeña, E. E., Lynn, S. J. E., & Krippner, S. E. (2000). *Varieties of anomalous experience: Examining the scientific evidence*. American Psychological Association.

Cavanagh, K., Strauss, C., Cicconi, F., Griffiths, N., Wyper, A., & Jones, F. (2013). A randomised controlled trial of a brief online mindfulness-based intervention. *Behaviour Research and Therapy*, *51*(9), 573–578. https://doi.org/10.1016/j.brat.2013.06.003

Chandler, J., & Shapiro, D. (2016). Conducting clinical research using crowdsourced convenience samples. *Annual Clinical Review of Psychology*, *12*, 53–81. https://doi.org/10.1146/annurev-clinpsy-021815-093623

Corneille, J. S., & Luke, D. (2021). Spontaneous spiritual awakenings: Phenomenology, altered states, individual differences, and well-being. *Frontiers in Psychology*, *12*, 720579. https://doi.org/10.3389/fpsyg.2021.720579

Douglas, B. D., Ewell, P. J., & Brauer, M. (2023). Data quality in online human-subjects research: Comparisons between MTurk, prolific, CloudResearch, qualtrics, and SONA. *PLoS ONE*, *18*(3), e0279720. https://doi.org/10.1371/journal.pone.0279720

Dunning, D., Tudor, K., Radley, L., Dalrymple, N., Funk, J., Vainre, M., Ford, T., Montero-Marin, J., Kuyken, W., & Dalgleish, T. (2022). Do mindfulness-based programmes improve the cognitive skills, behaviour and mental health of children and adolescents? An updated meta-analysis of randomised controlled trials. *BMJ Mental Health*, *25*(3), 135–142. https://doi.org/10.1136/ebmental-2022-300464

Farias, M., Maraldi, E., Wallenkampf, K. C., & Lucchetti, G. (2020). Adverse events in meditation practices and meditation-based therapies: A systematic review. *Acta Psychiatrica Scandinavica*, *142*(5), 374–393. https://doi.org/10.1111/acps.13225

Francis, S. E. B., Shawyer, F., Cayoun, B., Enticott, J., & Meadows, G. N. (2022). Group Mindfulness-Integrated Cognitive Behavior Therapy (MiCBT) reduces depression and anxiety and improves

flourishing in a transdiagnostic primary care sample compared to treatment-as-asual: A randomized controlled trial. *Frontiers in Psychiatry*, *13*, 815170. https://doi.org/10.3389/fpsyt.2022.815170

Galante, J., Friedrich, C., Dawson, A. F., Modrego-Alarcón, M., Gebbing, P., Delgado-Suárez, I., Gupta, R., Dean, L., Dalgleish, T., White, I. R., & Jones, P. B. (2021). Mindfulness-based programmes for mental health promotion in adults in nonclinical settings: A systematic review and meta-analysis of randomised controlled trials. *PLoS Medicine*, *18*(1), e1003481. https://doi.org/10.1371/journal.pmed.1003481

Galante, J., Grabovac, A., Wright, M., Ingram, D. M., Van Dam, N. T., Sanguinetti, J. L., Sparby, T., van Lutterveld, R., & Sacchet, M. D. (2023). A framework for the empirical investigation of mindfulness meditative development. *Mindfulness*, *14*(5), 1054–1067. https://doi.org/10.1007/s12671-023-02113-8

Garland, E. L., Hanley, A. W., Goldin, P. R., & Gross, J. J. (2017). Testing the mindfulness-to-meaning theory: Evidence for mindful positive emotion regulation from a reanalysis of longitudinal data. *PLoS ONE*, *12*(12), e0187727. https://doi.org/10.1371/journal.pone.0187727

Garland, E. L., Hanley, A. W., Nakamura, Y., Barrett, J. W., Baker, A. K., Reese, S. E., Riquino, M. R., Froeliger, B., & Donaldson, G. W. (2022). Mindfulness-oriented recovery enhancement vs supportive group therapy for co-occurring opioid misuse and chronic pain in primary care: A randomized clinical trial. *JAMA Internal Medicine*, *182*(4), 407–417. https://doi.org/10.1001/jamainternmed.2022.0033

Gendall, P. (1998). A framework for questionnaire design: Labaw revisited. *Marketing Bulletin*, *9*, 28–39.

Gill, L. N., Renault, R., Campbell, E., Rainville, P., & Khoury, B. (2020). Mindfulness induction and cognition: A systematic review and meta-analysis. *Consciousness and Cognition*, *84*, 102991. https://doi.org/10.1016/j.concog.2020.102991

Goldberg, S. B., Tucker, R. P., Greene, P. A., Davidson, R. J., Wampold, B. E., Kearney, D. J., & Simpson, T. L. (2018). Mindfulness-based interventions for psychiatric disorders: A systematic review and meta-analysis. *Clinical Psychology Review*, *59*, 52–60. https://doi.org/10.1016/j.cpr.2017.10.011

Goldberg, S. B., Tucker, R. P., Greene, P. A., Davidson, R. J., Kearney, D. J., & Simpson, T. L. (2019). Mindfulness-based cognitive therapy for the treatment of current depressive symptoms: A meta-analysis. *Cognitive Behaviour Therapy*, *48*(6), 445–462. https://doi.org/10.1080/16506073.2018.1556330

Goldberg, S. B., Lam, S. U., Britton, W. B., & Davidson, R. J. (2022). Prevalence of meditation-related adverse effects in a population-based sample in the United States. *Psychotherapy Research*, *32*(3), 291–305. https://doi.org/10.1080/10503307.2021.1933646

Goodman, J. K., & Paolacci, G. (2017). Crowdsourcing consumer research. *Journal of Consumer Research*, *44*(1), 196–210. https://doi.org/10.1093/jcr/ucx047

Grabovac, A. (2015). The stages of insight: Clinical relevance for mindfulness-based interventions. *Mindfulness*, *6*(3), 589–600. https://doi.org/10.1007/s12671-014-0294-2

Greyson, B. (2000). Some neuropsychological correlates of the physio-kundalini syndrome. *Journal of Transpersonal Psychology*, *32*, 123–134.

Griffiths, R. R., Richards, W. A., McCann, U., & Jesse, R. (2006). Psilocybin can occasion mystical-type experiences having substantial and sustained personal meaning and spiritual significance. *Psychopharmacology (Berl)*, *187*, 268–283. https://doi.org/10.1007/s00213-006-0457-5

Griffiths, R. R., Johnson, M. W., Richards, W. A., Richards, B. D., Jesse, R., MacLean, K. A., Barret, F. S., Cosimano, M. P., & Klinedinst, M. A. (2018). Psilocybin-occasioned mystical-type experience in combination with meditation and other spiritual practices produces enduring positive changes in psychological functioning and in trait measures of prosocial attitudes and behaviors. *Journal of Psychopharmacology*, *32*(1), 49–69. https://doi.org/10.1177/0269881117731279

Grof, S. (1989). *Spiritual emergency: When personal transformation becomes a crisis*. Penguin.

Grof, S. (2019). *Psychology of the future: Lessons from modern consciousness research*. Suny Press.

Grof, C., & Grof, S. (2017). Spiritual emergency: The understanding and treatment of transpersonal crises. *International Journal of Transpersonal Studies*, *36*, 30–43. https://doi.org/10.24972/ijts.2017.36.2.30

Guendelman, S., Medeiros, S., & Rampes, H. (2017). Mindfulness and emotion regulation: Insights from neurobiological, psychological, and clinical studies. *Frontiers in Psychology*, *8*, 220. https://doi.org/10.3389/fpsyg.2017.00220

Harrild, F., & Luke, D. (2020). An evaluation of the role of mystical experiences in transpersonal ecopsychology. *Transpersonal Psychology Review*, *22*(1). https://doi.org/10.53841/bpstran.2020.22.1.45

Harris, K. P., Rock, A. J., & Clark, G. I. (2019). Religious or spiritual problem? The clinical relevance of identifying and measuring spiritual emergency. *Journal of Transpersonal Psychology*, *51*(1), 89–118.

Hilton, L., Hempel, S., Ewing, B. A., Apaydin, E., Xenakis, L., Newberry, S., & Maglione, M. A. (2017). Mindfulness meditation for chronic pain: Systematic review and meta-analysis. *Annals of Behavioral Medicine*, *51*(2), 199–213. https://doi.org/10.1007/s12160-016-9844-2

Holdershaw, J., Gendall, P., & Wright, M. (2003). Predicting willingness to donate blood. *Australasian Marketing Journal*, *11*(1), 87–96. https://doi.org/10.1016/S1441-3582%2803%2970120-7

Hood Jr, R. W. (1975). The construction and preliminary validation of a measure of reported mystical experience. *Journal for the Scientific Study of Religion*, *14*(1), 29–41. https://doi.org/10.2307/1384454

Ingram, D. M. (2018). *Mastering the core teachings of the Buddha: An unusually hardcore Dharma book (revised and expanded)*. Aeon.

James, W. (1983). *The varieties of religious experience*. Penguin classics. (Original work published 1902).

Johnson, M. W., Hendricks, P. S., Barrett, F. S., & Griffiths, R. R. (2019). Classic psychedelics: An integrative review of epidemiology, therapeutics, mystical experience, and brain network function. *Pharmacology & Therapeutics*, *197*, 83–102. https://doi.org/10.1016/j.pharmthera.2018.11.010

Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Chatterji, S., Lee, S., Ormel, J., Üstün, T. B., & Wang, P. S. (2009). The global burden of mental disorders: An update from the WHO World Mental Health (WMH) surveys. *Epidemiology and Psychiatric Sciences*, *18*(1), 23–33. https://doi.org/10.1017/s1121189x00001421

Kuyken, W., Warren, F. C., Taylor, R. S., Whalley, B., Crane, C., Bondolfi, G., Hayes, R., Huijbers, M., Ma, H., Schweizer, S., Segal, Z., Speckens, A., Teasdale, J. D., Van Heeringen, K., Williams, M., Byford, S., Byng, R., & Dalgleish, T. (2016). Efficacy of mindfulness-based cognitive therapy in prevention of depressive relapse: An individual patient data meta-analysis from randomized trials. *JAMA Psychiatry*, *73*(6), 565–574. https://doi.org/10.1001/jamapsychiatry.2016.0076

Labaw, P. J. (1982). *Advanced questionnaire design*. Abe Books.

Lau, Y. (2020, October 5). *Increasing mindfulness in the workplace*. Forbes Human Resources Council. https://www.forbes.com/sites/forbeshumanresourcescouncil/2020/10/05/increasing-mindfulness-in-the-workplace

Li, W., Howard, M. O., Garland, E. L., McGovern, P., & Lazar, M. (2017). Mindfulness treatment for substance misuse: A systematic review and meta-analysis. *Journal of Substance Abuse Treatment*, *75*, 62–96. https://doi.org/10.1001/jamapsychiatry.2016.0076

Lindahl, J. R., Fisher, N. E., Cooper, D. J., Rosen, R. K., & Britton, W. B. (2017). The varieties of contemplative experience: A mixed-methods study of meditation-related challenges in Western Buddhists. *PLoS ONE*, *12*(5), e0176239. https://doi.org/10.1371/journal.pone.0176239

Luhrmann, T. M., Weisman, K., Aulino, F., Brahinsky, J. D., Dulin, J. C., Dzokoto, V. A., Legare, C. H., Lifshitz, M., Ng, E., Ross-Zehnder, N., & Smith, M. E. (2021). Sensing the presence of gods and spirits across cultures and faiths. *Proceedings of the National Academy of Sciences U S A*, *118*, e2016649118. https://doi.org/10.1073/pnas.2016649118

Lukoff, D. (1985). The diagnosis of mystical experiences with psychotic features. *Journal of Transpersonal Psychology*, *17*, 155–181.

Lukoff, D., & Everest, H. C. (1985). The myths in mental illness. *Journal of Transpersonal Psychology, 17*(2), 123–153

Lukoff, D., Lu, F., & Turner, R. (1998). From spiritual emergency to spiritual problem: The transpersonal roots of the new DSM-IV category. *Journal of Humanistic Psychology, 38*(2), 21–50. https://doi.org/10.1177/00221678980382003

Lutkajtis, A. (2018). The dark side of Dharma: Why have adverse effects of meditation been ignored in contemporary western secular contexts? *Journal for the Academic Study of Religion*, *31*(2). https://doi.org/10.1558/jasr.37053

Masci, D., & Hackett, C. (2018, January 2). *Meditation is common across many religious groups in the U.S*. Pew Research Centre. http://pewrsr.ch/2lHc0HC

McClintock, C. H., Lau, E., & Miller, L. (2016). Phenotypic dimensions of spirituality: Implications for mental health in China, India, and the United States. *Frontiers in Psychology*, *7*, 1600. https://doi.org/10.3389/fpsyg.2021.720579

McGee, M. D. (2020). Awakening and recovery. *Alcoholism Treatment Quarterly*, *38*, 266–285. https://doi.org/10.1080/07347324.2019.1632766

Menezes, A., & Moreira-Almeida, A. (2010). Religion, spirituality, and psychosis. *Current Psychiatry Reports*, *12*, 174–179. https://doi.org/10.1007/s11920-010-0117-7

National Alliance on Mental Illness (n.d.). *Mental health conditions*. https://www.nami.org/About-Mental-Illness/Mental-Health-Conditions

Parisi, A., Roberts, R. L., Hanley, A. W., & Garland, E. L. (2022). Mindfulness-oriented recovery enhancement for addictive behavior, psychiatric distress, and chronic pain: A multilevel meta-analysis of randomized controlled trials. *Mindfulness*, *13*(10), 2396–2412. https://doi.org/10.1007/s12671-022-01964-x

Parker, K. R. (2018). *Kundalini awakening: Integration of higher states of consciousness Into psychotherapy*. Pacifica Graduate Institute.

Parnas, J., & Henriksen, M. G. (2016). Mysticism and schizophrenia: A phenomenological exploration of the structure of consciousness in the schizophrenia spectrum disorders. *Consciousness and Cognition*, *43*, 75–88. https://doi.org/10.1016/j.concog.2016.05.010

Rock, A. J., & Clark, G. I. (2015). Spiritual emergency, psychosis and personality: A quantitative investigation. *Association for Transpersonal Psychology*, *47*(2), 263.

Roeser, R. W., Galla, B., & Baelen, R. N. (2022). *Mindfulness in schools: Evidence on the impacts of school-based mindfulness programs on student outcomes in P–12 educational settings*. Pennsylvania State University.

Rossiter, J. R. (2011). *Measurement for the social sciences: The C-OAR-SE method and why it must replace psychometrics*. Springer.

Shimokawa, K., Lambert, M. J., & Smart, D. W. (2010). Enhancing treatment outcome of patients at risk of treatment failure: Meta-analytic and mega-analytic review of a psychotherapy quality assurance system. *Journal of Consulting and Clinical Psychology, 78*(3), 298–311. https://doi.org/10.1037/a0019247

Simonsson, O., Martin, M., & Fisher, S. (2020a). Sociodemographic characteristics and health status of mindfulness users in the United States. *Mindfulness, 11*(12), 2725–2729. https://doi.org/10.1007/s12671-020-01486-4

Simonsson, O., Fisher, S., & Martin, M. (2020b). Awareness and experience of mindfulness in Britain. *Sociological Research Online*, *26*(4), 833–852. https://doi.org/10.1177/1360780420980761

Sobhana, M. (1994). *The progress of insight*. Buddhist Publication Society.

Sommers-Spijkerman, M., Austin, J., Bohlmeijer, E., & Pots, W. (2021). New evidence in the booming field of online mindfulness: An updated meta-analysis of randomized controlled trials. *JMIR Mental Health*, *8*(7), e28168. https://doi.org/10.2196/28168

Sparby, T., & Sacchet, M. D. (2022). Defining meditation: Foundations for an activity-based phenomenological classification system. *Frontiers in Psychology*, *12*, 795077. https://doi.org/10.3389/fpsyg.2021.795077

St Arnaud, K. O., & Cormier, D. C. (2017). Psychosis or spiritual emergency: The potential of developmental psychopathology for differential diagnosis. *International Journal of Transpersonal Studies*, *36*, 44–59. https://doi.org/10.24972/ijts.2017.36.2.44

Stace, W. T. (1960). *Mysticism and philosophy*. St. Martin's.

Strohmaier, S. (2020). The relationship between doses of mindfulness-based programs and depression, anxiety, stress, and mindfulness: A dose-response meta-regression of randomized controlled trials. *Mindfulness*, *11*(6), 1315–1335. https://doi.org/10.1007/s12671-020-01319-4

Taylor, S. (2013). The peak at the nadir: Psychological turmoil as the trigger for awakening experiences. *International Journal of Transpersonal Studies*, *32*, 1–12. https://doi.org/10.24972/ijts.2013.32.2.1

Taylor, S., & Egeto-Szabo, K. (2017). Exploring awakening experiences: A study of awakening experiences in terms of their triggers, characteristics, duration and after-effects. *The Journal of Transpersonal Psychology*, *49*(1), 45–65.

Taylor, G. B., Vasquez, T. S., Kastrinos, A., Fisher, C. L., Puig, A., & Bylund, C. L. (2022). The adverse effects of meditation-Interventions and mind–body practices: A systematic review. *Mindfulness, 13*(8), 1839–1856. https://doi.org/10.1007/s12671-022-01915-6

Tintinalli, J. E., Ma, O. J., Yealy, D. M., Meckler, G. D., Stapczynski, J. S., Cline, D. M., & Thomas, S. H. (2016). *Tintinalli's emergency medicine: A comprehensive study guide* (8th ed.). McGraw Hill Education.

Tudor, K., Maloney, S., Raja, A., Baer, R., Blakemore, S. J., Byford, S., Crane, C., Dalgleish, T., De Widle, K., Ford, T., Greenberg, M., Hinze, V., Lord, L., Radley, L., Opaleye, E. S., Taylor, L., Ukoumunne, O. C., Viner, M., Team, M. Y. R. I. A. D., & Montero-Marin, J. (2022). Universal mindfulness training in schools for adolescents: A scoping review and conceptual model of moderators, mediators, and implementation factors. *Prevention Science*, *23*(6), 934–953. https://doi.org/10.1007/s11121-022-01361-9

Turner, R. P., Lukoff, D., Barnhouse, R. T., & Lu, F. G. (1995). A culturally sensitive diagnostic category in the DSM-IV. *Journal of Nervous and Mental Disease*, *183*, 435–444. https://doi.org/10.1097/00005053-199507000-00003

Van Dam, N. T., Van Vugt, M. K., Vago, D. R., Schmalzl, L., Saron, C. D., Olendzki, A., & Meyer, D. E. (2018). Mind the hype: A critical evaluation and prescriptive agenda for research on mindfulness and meditation. *Perspectives on Psychological Science*, *13*(1), 36–61. https://doi.org/10.1177/1745691617709589

VanderKooi, L. (1997). Buddhist teachers' experience with extreme mental states in Western meditators. *Journal of Transpersonal Psychology*, *29*(1), 31–46.

Vonderlin, R., Biermann, M., Bohus, M., & Lyssenko, L. (2020). Mindfulness-based programs in the workplace: A meta-analysis

of randomized controlled trials. *Mindfulness*, *11*(7), 1579–1598. https://doi.org/10.1007/s12671-020-01328-3

Wallace, B. A. (2011). *Stilling the mind: Shamatha teachings from Dudjom Lingpa's vajra essence*. Simon and Schuster.

Walls, R., Hockberger, R., & Gausche-Hill, M. (2021). *Rosen's emergency medicine: Concepts and clinical practice: 2-Volume set*. Elsevier.

Wieczner, J. (2016). Meditation has become a billion-dollar business. *Fortune*, *12*, 1–2.

Wielgosz, J., Goldberg, S. B., Kral, T. R., Dunne, J. D., & Davidson, R. J. (2019). Mindfulness meditation and psychopathology. *Annual Review of Clinical Psychology*, *15*, 285–316. https://doi.org/10.1146/annurev-clinpsy-021815-093423

Williams, K. (2020, January). Mobile users spent $195 million in meditation apps last year, up 52% over 2018. *SensorTower*. https://sensortower.com/blog/meditation-apps-2019-revenue-downloads

Woollacott, M. H., Kason, Y., & Park, R. D. (2020). Investigation of the phenomenology, physiology and impact of spiritually transformative experiences–kundalini awakening. *Explore*, *17*, 1–10. https://doi.org/10.1016/j.explore.2020.07.005

Wright, M. J., Sanguinetti, J. L., Young, S., & Sacchet, M. D. (2023). Uniting contemplative theory and scientific investigation: Toward a comprehensive model of the mind. *Mindfulness*, *14*(5), 1088–1101. https://doi.org/10.1007/s12671-023-02101-y

Zanesco, A. P., Denkova, E., Rogers, S. L., MacNulty, W. K., & Jha, A. P. (2019). Mindfulness training as cognitive training in high-demand cohorts: An initial study in elite military servicemembers. *Progress in Brain Research*, *244*, 323–354. https://doi.org/10.1016/bs.pbr.2018.10.001