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REVIEW ARTICLE

In search of mindfulness: a review and reconsideration of cultural dynamics from a cognitive perspective

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ABSTRACT

We provide a critical review of mindfulness research, focusing on three core areas and questions. First, a meta-review and bibliometric analysis on mindfulness research trends identified a large number of meta-analyses published in the last 20 years, which tend to show positive effects on average, despite continuing questions on research quality, unclear pathways and uncertainty about the efficacy of individual practice components. Second, we briefly review current conceptualizations of mindfulness as both a practice and a trait (individual difference variable) and how these interpretations may align with the diverse Buddhist philosophical roots. We examine the multidimensionality of mindfulness within and across cultural contexts, which points to conflicts between bottom-up (functionalist) and top-down (culturally relativist meaning-system) interpretations. In order to reconcile these interpretations, we introduce a predictive coding approach which allows integrating bottom-up biological and individual difference dynamics with top-down normative and cultural influences. Finally, we apply these ideas to two examples of how mindfulness components might be present in different cultural practices: (a) stoic philosophy and (b) established concepts from Te Ao Māori. We argue that recontextualizing mindfulness in culturally relevant terms provides opportunities to enrich both mindfulness theory and practice, allowing for an integration of cognitive-functional and cultural relativist positions.

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Mindfulness has become a major health practice and commodity. Mindfulness interventions to improve mental health and wellbeing have become a major industry generating well over $4 billion annually and becoming a popular fashion, earning its own derogative label of McMindfulness (Purser 2019); yet the practice of mindfulness has also strongly influenced the emergence of a so-called third-wave of cognitive–behavioural therapies (Hayes 2004; Hayes and Hofmann 2017). With the emergent focus on mental health during the ongoing pandemic, the growth of the mindfulness industry has accelerated in the last year (Todd 2021). The general assumption among laypeople and mindfulness advocates alike is that a regular practice of mindfulness can improve mental health and wellbeing. We present a brief review showing the enormous success of mindfulness

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practices within the clinical and therapeutic practice and the impact that it has had on research. As we will show, contemporary mindfulness studies and applications have taken a scientific and clinical perspective. Yet, mindfulness practices originate in Buddhist philosophy, which is culturally and philosophically distant from everyday life in contemporary Western, highly educated, industrialised, economically rich and democratic (WEIRD) environments (Henrich 2020). Issues with the transfer of mindfulness into culturally distant contexts have been highlighted before (Monteiro et al. 2015). Our review offers a different angle on this debate by summarising some of the research trends in the literature and adding a new understanding of mindfulness through a cultural psychology and cognitive-evolutionary lens. The challenge is to understand how a very specific cultural and spiritual practice has become a multi-billion dollar business and health industry in settings that are culturally alien to the original practice. By reconciling cultural relativist practice with universalistic cognitive processes, we focus specifically on opportunities and challenges for research and implementation. We believe the quest to understand mindfulness raises profound questions about culture, cognition and mental health. To be clear on an important distinction of our discussion and highlight what we contribute to the literature – we do not argue for a cultural adaptation of mindfulness practices to fit different cultural contexts (DeLuca et al. 2018; Watson-Singleton et al. 2019). We instead argue that many culturally specific practices and techniques may entail mindfulness elements under different names or with different cultural explanations, but which nevertheless contribute to the success of mindfulness as a therapeutic approach and also business model. The main contribution of our review and discussion is on this intersection between culturally specific practices within a relatively universal human cognitive system.

To provide some structure to our argument, we present a brief review and bibliometric study on reviews and meta-analyses that have summarised mindfulness research. Based on this quantitative summary, we highlight a couple of core points about mindfulness as both a psychological trait and mental health intervention that we further elaborate on in the remainder of this article. Specifically, we highlight that current mindfulness research and practice has adopted a science-based universalistic approach to the human mind, which has moved away from the specific cultural and philosophical roots within which mindfulness first emerged, while showing difficulties to differentiate boundaries of practices that are distinct in their cultural and philosophical places of origin. We then trace both historical and contemporary work that indicates that cultural viewpoints matter for mindfulness practice and experience. In order to advance our understanding how mindfulness can be both culturally variable and a human universal, we introduce a predictive coding interpretation of mindfulness to reconcile these cultural experiences with evidence of universal cognitive processes. Equipped with these insights, we then propose a broader perspective on mindfulness and discuss how it may be compatible with distinct philosophical and cultural perspectives. To elaborate on this point, we briefly present two case studies: (a) a discussion of attention within stoic philosophy and (b) Māori cultural worldviews vis-à-vis specific Buddhist conceptualizations of mindfulness.

In this article, we decided to provide some snapshots as preliminary answers to the question of what mindfulness might be and how the interplay of diverse cultural practices, and mental health can inform us about how our brains and bodies may be functioning. The journey of how Eastern philosophical practices were adapted to fit western

secular contexts and the adaptation of contemporary mindfulness practice across cultural boundaries may have been successful because it builds on existing (often implicit or neglected) mental health practices that are common in various different cultural contexts and are based on universal human cognitive systems.

The state of mindfulness research – what do we know? A brief review and bibliometric analysis of meta-analyses

Mindfulness has emerged as a major mental health industry. How effective is mindfulness for improving mental health challenges? It is important to note here the first conceptual difficulty in talking about mindfulness, are we talking about mindfulness as practice or mindfulness as a characteristic of individuals that is partially influenced by practice? The former refers to a behavioural intervention that can be practiced, whereas the second refers to more stable individual differences, which may only partially be malleable to change (similar to the classic trait perspective in psychology) (Fischer 2017; Quirin et al. 2020).

When talking about mindfulness as an individual difference variable, researcher conceptualise it as trait-like patterns of thoughts and behaviours, which has at least five major components: Acting with Awareness, Non-Reacting, Non-Judging, Describing, and Observing (Baer et al. 2006, 2008). These components are thought to capture more stable personality-like differences between individuals (Pepping and Duvenage 2016). Yet, mindful practice assumes that these processes are dynamic, can be trained and cultivated, making them more malleable and situationally responsive (Kiken et al. 2015). This so-called state perspective may transform individuals into more healthy and balanced individuals – this is the quintessential reasoning for mindfulness based therapy, for example as part of the 8-week long Mindfulness Based Stress Reduction (MBSR) (Kabat-Zinn 2003; Grossman et al. 2004).

When talking about mindfulness practice, what do we know about the effectiveness of these practices for health and wellbeing? One of the standard methods for determining the overall effectiveness of any intervention is to conduct a meta-analysis of available studies. Mindfulness has been studied extensively in the last few decades and a number of meta-analyses are already available and allow us to compare mindfulness practice with other therapeutic approaches. Driven by the context of the COVID-19 pandemic, we conducted a literature search in March 2020, focusing on meta-analyses and systematic reviews of randomised controlled trials that were designed to improve general well-being and reduce anxiety, depression, and stress during the COVID-19 epidemic (Fischer et al. 2020). The focus of this project was to identify possible mental health interventions that could help with addressing mental health challenges during the COVID-19 pandemic and would not require support from a mental health practitioners (e.g. individuals would be able to apply these techniques at home without supervision). We found a total of 1532 meta-analyses and reviews of randomised controlled trials in our initial search, of these at least 86 reviews and meta-analyses specifically and exclusively focused on mindfulness. This is an impressive body of work and points to the maturation of mindfulness research. Many interventions were group focused and involved complex interpersonal and group dynamics. We therefore focused our quantitative analysis on meta-analyses that included mindfulness interventions that were done by individuals

alone and without the guidance by trainers or coaches (which is also central for periods of physical distancing, quarantines and lockdowns in the current pandemic environment). The final selection included 10 meta-analyses with individuum-focused mindfulness interventions. Overall, the meta-analyses showed effectiveness within the small to medium range for reducing stress, anxiety and depression and increasing subjective well-being (Cavanagh et al. 2014; Spijkerman et al. 2016; Stratton et al. 2017; Blanck et al. 2018; Huang et al. 2018; Ma et al. 2019; Slemp et al. 2019; Strohmaier 2020; Vonderlin et al. 2020) Nevertheless, the effect of mindfulness weakened when compared to active control groups instead of waitlist or passive controls. The effects were also typically relatively short-lasting (Goldberg et al. 2019). The relationship between intervention length and intervention efficacy remains unclear, with some studies finding longer interventions to produce better results, whilst others failed to find significant effects of programme length on effectiveness (Virgili 2015; Schumer et al. 2018; Dawson et al. 2020). It is also noteworthy that this more targeted quantitative summary of self-guided mindfulness interventions suggested significantly smaller effects compared to clinician guided mindfulness interventions (Goldberg et al. 2019). There seems to be an important social component to mindfulness that goes beyond individual practice.

Comparing mindfulness-based interventions directly with other self-guided therapeutic interventions, the effects of mindfulness-only interventions were overall very similar to cognitive–behavioural therapy. Modern therapeutic approaches such as acceptance and commitment therapy and third-wave cognitive–behavioural therapies (e.g. Mindfulness-based Cognitive Therapy) often include mindfulness modules, making direct comparisons challenging. Available evidence in other areas such as chronic pain research suggest that mindfulness interventions are as effective as cognitive–behavioural interventions (Khoo et al. 2019).

This previous review of meta-analyses was targeted specifically on the context of COVID-19 and the aim was to provide evidence from randomised controlled trials for safe practices while being in quarantine or lockdown. As mindfulness is an important component of contemporary mental health interventions, it is not surprising that we found a relatively large number of meta-analysis of randomised controlled trials when searching for self-guided interventions to help with addressing anxiety and stress issues. Given the size of the mindfulness industry, it raises the question about the scope of mindfulness research in general. What is the larger focus of mindfulness research? To answer this question, we conducted a new literature search on Jan 18, 2021 in APA PsycINFO with the keywords ‘meta-analysis’ and ‘mindfulness’ and restricted the search to objects classified as ‘review’ within the database. We focused on meta-analyses and reviews because this should give us an idea of core research trends of mindfulness research – e.g. sufficient numbers of primary studies have been conducted on a specific topic and researchers found it informative and useful to summarise those studies. We found a total of 432 meta-analyses published between 2003 and 2021, which means that on average at least 3 meta-analyses focusing on mindfulness were published per year. Of specific relevance for our purposes focusing on cultural dynamics of mindfulness, among the top 50 author-assigned keywords, none of the keywords referred to mindfulness as implying a cultural or ritualistic practice. Instead, the keywords emphasised a clinical and therapeutic analysis of mindfulness-based interventions. The top 10 author keywords were (in this order): meta-analysis, mindfulness,

systematic review, depression, anxiety, meditation, stress, review, intervention and yoga. To better understand the primary focus of these previous meta-analyses, we constructed a keyword co-occurrence matrix via the bibliometric package in R (Aria and Cuccurullo 2017) and plotted the network using VOSviewer (van Eck and Waltman 2014). As can be seen in Figure 1, there were four major networks of articles as indicated by the joint use of keywords. These four networks emphasised different aspects of mindfulness as clinical practice. Cluster 1 (in red) featured stress reduction, anxiety, cognitive therapy and stress as central keywords, cluster 2 (in green) includes meta-analyses with core keywords 'meditation', 'mindfulness', 'program', 'impact' and 'mental health'; cluster 3 (in blue) focuses on 'randomized controlled trial', 'cognitive behavioral therapy', 'therapy', 'acceptance' (as part of acceptance therapy) and 'efficacy'; and cluster 4 (in yellow) focused on studies that involved 'women', 'breast cancer', 'survivors', 'quality of life' and 'depression'. Hence, these keyword-based clusters clearly demonstrate the application of mindfulness based interventions for different clinical and therapeutic purposes.

A second option is to create a thematic map based on the meta-analysis abstracts. Using lemming of words within each of the abstracts and extracting any word that occurred more than 10 times, this allows a more fine-grained capture of nuances within the overall mindfulness research domain as seen through the abstracts of these systematic reviews and meta-analyses of mindfulness research. Three major themes emerged in this analysis, again separating different nuances of medical focus, methodological rigour (studies criticising primary research studies) and overall summaries of the larger evidence. As before, no word relating to cultural, spiritual, philosophical or religious practice or meaning featured in a meaningful way in this thematic summary of the abstracts. The term 'practice' appeared 83 times and 'practition' occurred 13 times.

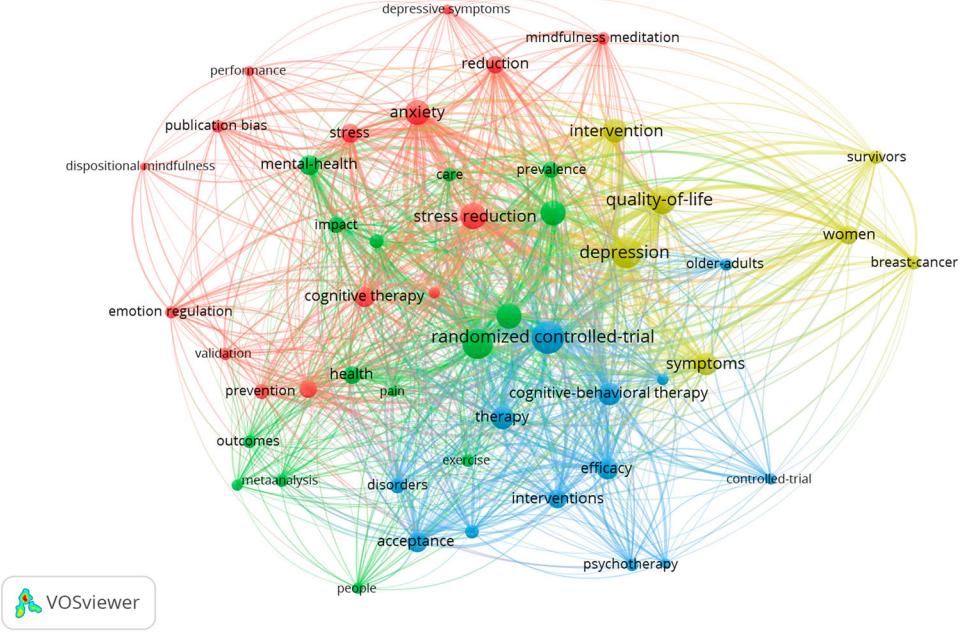

Figure 1. Network structure of keywords used in meta-analyses on mindfulness.

However, both terms emerged within a thematic group of reviews that showed high centrality within the larger research field and this group provided a systematic and evidence-based review of mind and health. Therefore, the term 'practice' is focusing on the application of scientifically evaluated therapeutic practices rather than a culturally meaningful exercise. When searching for the stem 'cultur*' in all the abstracts, eight abstracts mentioned the term culture in some context. Of these, only three studies had a more focused cultural lens relevant for the current article. One meta-analysis addressed cultural adaptation of mindfulness applications to Hispanic groups in the US (Castellanos et al. 2020), the second focused on a narrative review of transcendent states during meditation and other contemplative practices (Wahbeh et al. 2018) and the third criticised the relative lack of evidence from non-Western contexts (Fischer et al. 2020).

A conceptual issue that clearly emerged from both the COVID-19 focused meta-analysis as well as this bibliometric review of the mindfulness literature is the problematic classification of mindfulness interventions. Mindfulness is often difficult to differentiate from other practices, such as meditation and hence researchers often use the terms mindfulness and meditation interchangeably (Van Dam et al. 2018). Some mindfulness practices such as Mindfulness Based Stress Reduction (Kabat-Zinn 2013) explicitly include meditative and yoga-based elements. It is often difficult to draw a line as to when meditation practices become 'mindful' and how practice and disposition relate to each other. This is clearly evident in the keywords that we found in our bibliometric review reported here, meditation and yoga both featured centrally in the overall database (but typically discussed from a decontextualised clinical perspective).

Related to this issue of distinctiveness of specific components, similar vagueness is associated with the efficacy of specific practice elements. For example, the amount of home practice is a key aspect of many mindfulness programmes, yet it was found to be beneficial (Vonderlin et al. 2020), without demonstrable impact (Spijkerman et al. 2016) and even associated with more anxiety (Bamber and Morpeth 2019). Similarly, the effects of duration of the intervention also yielded contradictory findings (Schumer et al. 2018). Could there be too much mindfulness practice? This might be difficult to imagine, but these summaries of self-guided interventions do suggest that this is a possibility; if not, we would see a rather robust signal of greater wellbeing with more mindfulness practice that should appear across these hundreds of studies.

Summarising so far, mindfulness appears to be an effective intervention strategy. Yet, we do not yet understand the underlying psychological and biological pathways. Studies summarised in these meta-analyses rarely report on the potential pathways that may explain why mindfulness is effective in improving wellbeing. Some research indicated that mindfulness interventions lead to largest changes in individual differences of non-judging of inner experiences, acting with awareness and observing of experiences (Monteiro et al. 2018; Ortet et al. 2020). However, other studies do not show any effect of mindfulness practice on these facets (Manuel et al. 2017), do not find reliable differences between distinct mindfulness facets (Hsiao et al. 2019) or suggest that effects might be tied to mindfulness aspects expressing body awareness and decentering (Bednar et al. 2020). Overall, this adds further complexity in our attempt to understand the active components of mindfulness interventions and their plausible pathways for effectiveness (Cebolla et al. 2017). This is particularly important because the effectiveness of mindfulness may be condition specific and some facets such as increasing individuals' awareness

to body perceptions may actually be detrimental for conditions such as anxiety (Mizera et al. 2016) or may be culturally dependent given the global differences with which individuals pay attention to stimuli arising within them or coming from their social environment (Fischer 2017).

To put the overall positive information on effectiveness into context, one central problem with contemporary experimental research in the social and clinical area, including work on mindfulness is that studies are often underpowered (Van Dam et al. 2018). A further significant problem are methodological shortcomings. Any intervention study needs to address five major types of biases while conducting and evaluating the study (Higgins et al. 2011, 2019): (1) selection bias, which refers to failures to randomly assign individuals to treatment and control groups; (2) performance bias, which in ideal conditions would conceal the treatment condition from the participant, the person treating the participant and the researcher analysing the data; (3) detection bias, which refers to biases in how outcomes are measured and evaluated; (4) attrition bias, which includes concerns about differential drop out of subjects or outcome variables; and (5) reporting bias, which concerns the complete reporting of all core results. As could be imagined, some of these biases are somewhat more difficult to circumvent in the case of mindfulness interventions. Individuals often self-select into participating in mindfulness intervention trials, they might be knowledgeable about the condition that they are assigned to, they may have preconceived beliefs that influence how they respond to outcome measures captured via subjectively rated Likert-scales and they may decide to discontinue treatment based on personal beliefs of efficacy. For this reason, the majority of studies included in meta-analyses suffer from moderate to sometimes strong risk of bias (see Table 1 in Fischer et al. 2020).

Concluding what we know about the effectiveness, the meta-analyses suggest that mindfulness seems to be effective in reducing psychological problems, at least temporarily. Group interventions or interventions guided by health care professionals are more effective, which raises interesting questions about social dynamics in the practice of mindfulness. But we also need to realise that the quality of studies evaluating the effectiveness of these interventions is often poor, the active elements within interventions and what specifically counts as mindfulness within a larger set of practices are poorly understood and it is unclear whether there are clear boundaries for the effectiveness (or even harm) of mindfulness. Put differently and bluntly, mindfulness works – but what is it? Most importantly, as the bibliometric review of mindfulness reviews shows, the cultural aspect of mindful practice has largely disappeared from psychological research. It is this cultural angle that we focus on for the rest of our review.

Translation and dialog: is 'mindfulness' truly Buddhist?

So far, we have explicitly avoided defining mindfulness. Our contemporary understanding of mindfulness in psychology is derived from Buddhist philosophy (Baer et al. 2006). Yet, it is unclear how far the current conceptualizations strayed from their original understanding and whether currently employed mindfulness interventions may be mislabelled as Buddhist (for an example see: Purser 2019). First, we need to remind ourselves that Buddhism is not a monolithic philosophy or religion. Most writers on mindfulness over the last 150 years seem to have been influenced

by Theravāda Buddhist philosophy (Gilpin 2008; Gethin 2011), a Buddhist tradition that can substantially differ from earlier Buddhist writings (Anālayo 2004, 2018, 2019) and from other strands of Buddhism. Some writers have termed this school of thought 'Buddhist modernism' (Sharf 1995; McMahan 2008), given the widespread contemporary usage. Even within this specific type of Buddhist philosophy, it is important to acknowledge that the term 'mindfulness' is not a literal translation of the original term used in Pali (*sati*), but rather represents one approximation of the meaning of *sati* (Sun 2014). To illustrate, Rhys Davids (cited in: Williams and Kabat-Zinn 2013, p. 23) in his translation of the term in 1910 wrote:

> Etymologically *Sati* is Memory. But as happened at the rise of Buddhism to so many other expressions in common use, a new connotation was then attached to the word, a connotation that gave a new meaning to it, and renders 'memory' a most inadequate and misleading translation. It became the memory, recollection, calling-to-mind, being-aware-of, certain specified facts. Of these the most important was the impermanence (the coming to be as the result of a cause, and the passing away again) of all phenomena, bodily and mental. And it included the repeated application of this awareness, to each experience of life, from the ethical point of view.

It is important to note that Rhys seems to have arrived at this translation only in 1910 and his previous translation attempts showed substantial uncertainty about the term, translating it either as 'mental activity' or 'thought' (Gethin 2011). By using the translation of *sati* as mindfulness, the term became placed in and understandable from a long-standing contemplative practice.

Western shifts to mindfulness as 'bare attention'

The second major event that shaped the understanding of mindfulness in Western psychology can be traced back to is to the publication of Nyanaponika Thera's book 'The Heart of Buddhist Meditation' in 1954 which defined it as moment-to-moment, lucid, non-reactive, non-judgmental awareness of whatever appears to consciousness (Thera 1998). This conceptualisation together with the introduction of de-contextualized awareness practices at the same time has made mindfulness practice accessible to lay practitioners without a background in Buddhist ethics and profoundly shaped the development of later psychological and medical implementations. It is difficult to overstate the importance that this conceptualisation of mindfulness had on the Western understanding of mindfulness, with most interventions and mindfulness measures being aligned with this definition of mindfulness (Nilsson and Kazemi 2016; Curtis 2019). The conceptual basis of current mindfulness interventions and measurement can in large parts be traced to a radical re-definition of mindfulness as bare attention, intentionally stripping away complex ethical notions to make it approachable to lay-practitioners. Could we state that 'mindfulness' as currently conceptualised in psychological and clinical practice is following Buddhist principles? This is a question that might have no conclusive answer and will depend on whether one aligns with an interpretation of mindfulness as 'bare attention' (Sharf 1995). This issue is further complicated by that fact that many MBIs now contain material taken from other cultural traditions (e.g. yoga, meditation).

Mindfulness as ritualistic practice

Mindfulness emerged within Buddhist philosophy, tied to specific ritualistic practices that individuals would need to follow. Rituals can be studied and understood in two ways: (1) by focusing on the bottom-up features that constitute ritual and may bring about physiological, psychological and social changes through performing specific types of behaviour and (2) by focusing on the top-down meaning-systems that are created around performing these ritualistic actions (Hobson et al. 2018). Considering mindfulness, a core feature of mindfulness rituals is the careful attention to repeated action which is decoupled from any direct purpose. Recent insights from evolutionary biology and psychology have suggested that the mere performance of repetitive actions can decrease stress at both physiological and subjective psychological level (Lang et al. 2015; Karl and Fischer 2018). It is this ritualistic, behavioural component associated with possible positive bottom-up effects that has been transported to Western audiences in the form of therapeutic interventions. At the same time, the top-down meaning effects centred around ethics and moral questions, which were central to a Buddhist practice of mindfulness rituals, have been removed from Western practice (Monteiro et al. 2018).

Is mindfulness unitary?

Up until now, we have discussed mindfulness as a unitary construct within clinical practice. While this might be the case on a conceptual level, both in its operationalisation in western definitions (for example: Kabat-Zinn 1994, 2013) and psychological measures where researchers often extract a single score of mindfulness, mindfulness is likely to have different components (Lau et al. 2006; Blanke and Brose 2017). This is not only true for mindfulness as state that is altered during practice, but also in individual differences in mindfulness that might arise from differential experiences of states (Kiken et al. 2015; Karl and Fischer 2021). We already mentioned the five different facets that are differentiated in the research tradition studying mindfulness as an individual difference construct. This is work based on empirical analyses of multiple existing trait measures of mindfulness (Baer et al. 2006), which yielded the aforementioned five facets: Acting with Awareness, Non-Judging, Non-Reacting, Describing, and Observing. The idea is that these stable individual differences are reflective of individual differences in momentary, state like processes which can be captured in state measures (Blanke and Brose 2017). These instruments were inspired by Buddhist philosophy and the five components are therefore supposed to capture central elements within this original tradition. There are also distinct efforts to define mindfulness as a Western concept, more focused on openness and being receptive to new ideas and experiences (Pirson et al. 2018). A recent analysis (Karl and Fischer 2020) demonstrated that more Buddhist inspired instruments were empirically distinct from measures that operationalise mindfulness as 'Western Mindfulness' (Pirson et al. 2018). However, this study also indicated that current mindfulness measures might be affected by wording effects, so that negatively worded items are understood and responded to differently than positively worded items. Therefore, cultural worldviews may influence how people understand and report mindfulness experiences.

One of the central issues to the exploration of cultural differences in the conceptualisation, predictors, and effects of mindfulness is measurement invariance across cultural groups. Briefly, measurement invariance can be separated into at least three levels: Configural, Metric, and Scalar (for a more detailed review see: Fischer and Karl 2019). Configural invariance captures similarity in factorial structure, metric invariance captures similarity in factor-loadings, and scalar invariance captures similarity in item intercepts. Configural invariance between groups indicates that the structure of the measures concept is similar (the same items are associated with each construct), metric invariance indicates that the items are of similar importance for each concept, and scalar invariance indicates that participants responses are not systematically affected by other variables or processes across cultural groups.

Currently, information on the appropriateness to measure mindfulness across cultures is lacking for many mindfulness measures. There is some indication of configural invariance, for example instruments such as the Mindful Attention Awareness Scale (MAAS) capture perceptions and experiences that are meaningful to Spanish participants (Johnson et al. 2014). Nevertheless, initial investigations into mindfulness measurement outside WEIRD contexts have found mixed results with invariance results dependent on the measure, with simpler structures for the MAAS (Christopher, Charoensuk, et al. 2009) or reduced versions of the FFMQ (Haas and Akamatsu 2019) performing better compared to the full version (suggesting problems with the items in the full version). Importantly, mindfulness measures to date have not been shown to demonstrate scalar invariance, even in simpler two culture comparisons, preventing comparisons of means between cultures and implying that the survey responses are influenced by other factors. This lack of scalar invariance might underly the findings of studies such as Christopher, Christopher et al. (2009) who found that untrained US college students scored higher on some facets of mindfulness compared to ordained Buddhist monks, raising concerns about the applicability and meaningfulness of Western developed mindfulness measures in non-Western contexts or whether these measure capture distinct components not aligned with Buddhist mindful practice.

Extending the scope and breadth of cross-cultural work, Karl et al. (2020) analysed responses to the most widely used five-facet measure of mindfulness (FFMQ) across 16 cultural groups and found that mindfulness may show a conceptual core that is recognisable to individuals across cultures (configural invariance). At the same time, the individual components showed substantive cultural variability in how individuals understood the terms, even between closely related cultures. Cultural context seems to shape what individuals perceive as being mindful with structural fit systematically related to higher individualism and lower norm-tightness, indicating that the FFMQ might be a better measurement instrument of mindfulness in more individualistic contexts. In addition to culture-level understandings, basic biological individual differences such as personality traits and reinforcement sensitivity of behaviour also seems to shape the extent to which individuals report mindful behaviour (Karl and Fischer 2019; Karl et al. 2021). It becomes clear that mindfulness is a complex personal experience that is shaped both by cultural expectations and norms as well as individual differences rooted in biology and living conditions.

Ways forward for mindfulness research and practice in psychology

Psychological practitioners and researchers make little, if any, mention of the wider underpinning of a Buddhist ethical system associated with top-down interpretations of rituals and rather employ mindfulness practice from a functionalist viewpoint, using a distinct bottom-up perspective of mindfulness rituals (for a theoretical perspective see: Milton 2011; for an applied clinical perspective see: Milton and Ma 2011). This does not imply that these purely functionalistic implementations of mindfulness cannot be efficient. The performance of mindfulness-like rituals can have anxiolytic effects even in the absence of a meaning system (Karl and Fischer 2018). Similarly, current mindfulness practices are likely to have functionalistic elements that contribute to wellbeing, as evidenced in the overall effects reported in the various meta-analyses.

Nevertheless, decades of research in the medical field on the placebo effect (Krummenacher et al. 2014) and research on the efficacy on rituals (Legare and Souza 2012) show that expectancy effects and meaning systems have a clear and unique contribution to wellbeing. As we outlined above, the quality of mindfulness evaluation studies is typically poor, and it is understandably difficult to run a double-blind experiment when the core part of the intervention is subjective reflection on one's experiences. This self-focus opens the door for alternative, top-down driven explanations such as placebo effects. Current mindfulness research and practice has widely focused on what researchers of ritual practice would call bottom-up approaches focused on functionalistic-cognitive processes and less on top-down processes such as moral ethics and meaning (Hobson et al. 2018).

The role of the mind in conscious experience: A predictive coding approach

In order to understand both biological processes and cultural realities and in order to integrate bottom-up and top-down ritualistic perspective, we need to briefly discuss the predictive coding framework as a new approach for studying the human mind (Hohwy 2012; Clark 2013; Griffin and Fletcher 2017). The central idea is that our brain works like a Bayesian operator in which pre-existing models of the world are stored mentally and are constantly tested against sensory input. Instead of experiencing raw sensory information about the world, it is any deviations from expectations about the world (similar to Bayesian priors) that are passed onwards in the brain hierarchy and are hence consciously experienced (Clark 2013). The function of our brain is to provide an estimation of what our environment is expected to be like which then shapes how sensory input from internal and external sensory systems is interpreted and processed. What is informative and relevant for the organism is any deviation from prior expectation; as a consequence, differences between expectation and the current signal are preferentially processed and communicated within the brain hierarchy. Top-down signals (based on prior beliefs) explain and account for those elements that are in line with predictions. In contrast, if any error signal indicating a mismatch between expectation and sensory input arrives at a higher level of the brain hierarchy, this will lead to an update of expectations. A well-functioning organism therefore is able to have accurate priors that differ only minimally from incoming signals (smaller prediction error). The overarching goal of our brain is to minimise prediction error, and update expectations to allow a more up-

to-date representation of the environment. What we consciously experience is more of a reflection of our imagination than a real momentary assessment of our current environment. Such a predictive coding model explains how our capacity limited brains manage the fast and efficient processing of complex information, primarily by pointing out that we only really process predictions errors and essentially live in an imaginary world of our own prediction. In summary, predictive coding proposes that due to the overwhelming amount of information available at all times to the brain and to allow timely processing of novel and important information, large parts of incoming information are predicted in advance from existing information (Friston 2009).

Mental models and the associated expectations arise through socialisation and social learning through scaffolded interactions with key social figures that have modelled and reinforced certain behaviour patterns. Predictions are derived from socialisation experiences in which mental categories are being formed and reinforced, which in turn then set the expectations for sensory input to be processed. As the saying goes, one cannot perceive what one cannot classify (cf. Friston et al. 2014). This predictive processing perspective opens up new avenues for understanding how culture and mindful experience relate to each other. Mental models by individuals are not just the result of individual reasoning but are the interactive product of cumulative and communally shared reasoning (Clark 2013). This interactive component in the creation of mental models simultaneously enables and constrains our perception and interpretation of our environment, including our own minds and bodies. New ideas (such as mindfulness) that become collectively shared can provide new categories for classifying and therefore experiencing our environment. This process of cultural dynamics shaping our perceptual processes through creating mental expectations about the internal and external environment has been aptly labelled 'incremental downstream epistemic engineering' by Sterelny (2003). At the same time, the bottom-up processing of sensory information that does not match predictions requires a careful calibration and attention to the quality of incoming sensory information, highlighting the importance of practices that help with fine-tuning perceptive systems vis-a-vis mental models. In a way, this is what 'bare attention' mindfulness is attempting to achieve.

In this view bottom-up biological determinants of the sensory system, habitual experiences such as mediation that shape and sharpen category systems (e.g. mental models), and top-down cultural perspectives that provide categories such as 'mindfulness' for interpreting sensory states jointly contribute information that influences the experience of what we call mindfulness and relevant components within this larger concept, including attention and emotion regulation skills (Lutz et al. 2019; Manjaly and Iglesias 2020; for a discussion of traditional Buddhist views and predictive coding see: Pagnoni and Guareschi 2017).

We believe an important way forward for mindfulness research and practice is to examine the interplay between collectively shared understandings of mindfulness, individual predispositions and situational variables (e.g. conditions suitable to experiencing mindfulness) (for related work on altered states of consciousness: Fischer and Tasananukorn 2018). Research that investigated the influence of bottom-up effects in mindful practice demonstrated that personality differences influence the effect of mindfulness practice on outcomes such as wellbeing (de Vibe et al. 2015; Nyklíček and Irrmischer 2017; Jagielski et al. 2020; Krick and Felfe 2020), which suggests that individual

differences shape downstream effects of mindfulness practice. Similarly, top-down influences such as expectations about effectiveness and normative importance of mindfulness practice within a specific community are likely to shape both the engagement with mindfulness practice and its effectiveness (Beattie et al. 2019, 2020; Krick and Felfe 2020). Nevertheless, currently systematic examinations of top-down influences around culturally shared expectations on both the effectiveness of mindfulness interventions and individual differences in the experience of states of mindfulness are largely missing (Fischer et al. 2020). Considering both the bottom-up and top-down perspectives utilised in the ritual studies combined with a cognitive perspective informed by predictive coding modelling could conceptually and empirically enrich mindfulness theory and practice.

Reconceptualizing mindfulness within cultural context

In the final section, we will explore how a reconceptualization of mindfulness along specific established cultural practices can help to explain both the apparent success of mindfulness as a therapeutic practice and how different cultural practices can be interpreted and understood in light of mindfulness. Extending our previous arguments from a predictive coding perspective with a cultural evolution perspective (Henrich and McElreath 2003), it is likely that cultural practices in a wide range of cultures emerged independently in the face of universal demands to fine-tune sensory information processing. These demands generate the environment in which practices that resemble mindfulness provide individuals with a selective advantage, because these activities would have allowed them to calibrate mental models by focusing on unfiltered state experiences, helped in managing emotions and maintaining task focus (see: Hobson et al. 2018). Current research has paid relatively little attention to potential overlaps and differences of mindfulness and similar cultural practices across cultural contexts. It is possible though, to examine a wider range of cultural and philosophical practices across the world and by doing so, we can identify practices that strongly resemble mindfulness in spirit and practice.

Our discussion is also different from previous conceptualizations and work that has aimed to make mindfulness-based practices more culturally relevant or acceptable to specific cultural groups (Watson-Singleton et al. 2019). Adaptations of therapeutic approaches can be distinguished in terms of surface level (e.g. translations, involving community-members as facilitators) and deep-level features (e.g. changes to content and dynamics of the intervention) (Resnicow et al. 2000). Our discussion is more aligned with these deep-level features, but focusing on what cultural specific features in distinct cultural contexts may share some similarities with what is typically considered mindfulness practice (as derived and adapted from Buddhist philosophy origins). We focus on two examples here.

Awareness and attention in stoic philosophy and practice

First, a number of researchers have pointed to the parallels between mindfulness and meditation practices in Buddhist philosophy on one hand and stoic philosophical thoughts and practices originating in ancient Greece (Pathak et al. 2017; Robertson 2019). Stoic practices have focused on contemplative practices aimed at helping

individuals to readjust their perspective about themselves and regulating their emotions through non-reacting to uncontrollable emotional stimuli (a number of surviving techniques and lectures on this can be found in the Enchiridion: Epictetus 2004).

Stoic school of thoughts provide some philosophical underpinnings that resemble mindfulness within a modern Buddhist interpretation, and developed techniques aligned with current mindfulness practice. A clear parallel between present-moment awareness mindfulness and stoic thought and practice is found in conceptual writings such as Epictetus *Discourses* (Epictetus 1995). To provide a brief excerpt on the similarity with mindfulness, here is a section from Epictetus' Discourses:

> For to begin with, and most seriously of all, a habit of inattention will grow up in you, and then a habit of deferring any effort to pay attention. […] 'Today I'd like to play.' Well, what is to prevent you from doing so attentively? For is there any area of life to which our attention should not be extended? Will you do anything worse, then, by paying attention, or better by not attending? And is there anything whatever in life that is done better by those who remain inattentive? Does an inattentive carpenter carry out his work with greater precision? Does an inattentive helmsman steer his vessel more safely? And is any function of lesser importance accomplished better through inattention? Don't you realize that when you've let your mind roam free, it is no longer in your power to call it back, either to decorum, or to self-respect, or to good order? But instead you do everything that comes into your head; you follow your impulses. (Epictetus et al. 2014, p. 326)

Similar thoughts are echoed by writers such as Marcus Aurelius:

> Throw everything else aside, and hold on to these few things only and keep in mind that each of us only lives in the present, this brief moment of time; the rest of our life has been lived already or lies in the uncertain future. (III,10,1 *Marcus Aurelius* 2013)

Beyond similarities in conceptual considerations around awareness, we can also find an overlap in implementation of those thoughts, following on from the previous advice Marcus Aurelius writes:

> To the preceding pieces of advice, one more should be added: always make a definition or delineation of whatever presents itself to your mind, so that you can see distinctly what sort of thing it is when stripped down to its essence as a whole and in all its parts, and tell yourself its proper name, and the name of the elements from which it has been put together and into which it will be dissolved. (III,11,1 *Marcus Aurelius*, 2013)

Similar practices involving paying attention to the present moment and subsequently deconstructing it through describing it's individual elements can be found in MBSR exercises. This includes the Awareness of Pleasant or Unpleasant Events Calendar, which encourages participants to deconstruct and label the moment into physical and emotional components and re-assess them (Kabat-Zinn 2013).

Beyond similarities in awareness and describing, we can also find conceptual overlaps in decentering practices. Decentering concerns the ability of an individual to 'step back' and adopt a more detached perspective on themselves, perceiving current experiences as transient, allowing them to reappraise their current situation (Hoge et al. 2015). Decentring is often seen as a common outcome of mindfulness interventions (Josefsson et al. 2014), but some researchers have argued that it is actually an active part of mindfulness (Lau et al. 2006). Importantly, this ability to perceive both thoughts and emotions as transient events is a core feature of stoic emotion theory. Techniques to aid individuals in

decentring can be found for example in 'the view from above', central to the practices of Marcus Aurelius (for a detailed discussion of the ancient source material see *Marcus Aurelius*, 2013; for a modern implementation of the technique see Robertson 2019). Perceiving thoughts as transient, decentring and reassessing are essential parts of CBT (Baer 2010), which has explicit foundations in stoic thought (Beck 1979; Robertson 2019). For example, in the Cognitive Therapy of Depression book, Beck writes:

> The philosophical origins of cognitive therapy can be traced back to Stoic philosophers, particularly Zeno of Citium (fourth century B.C.), Chrysippus, Cicero, Seneca, Epictetus, and Marcus Aurelius. Epictetus wrote in The Enchiridion: "Men are disturbed not by things but by the views which they take of them." Like Stoicism, Eastern philosophies such as Taoism and Buddhism have emphasized that human emotions are based on ideas. Therefore, control of most intense feelings may be achieved by changing one's ideas. (Beck 1979, p. 8)

In cognitive models, cognitions, which refer to how an individual appraises a situation, concern someone's 'stream of consciousness' – a reflection of the individual himself as well as worldviews. Modifications to this cognitive system have an impact on the patient's emotional and behavioural state (Beck 1979). Hence, in CBT the patient is made aware of potentially distorted cognitions, with the ultimate goal being the reassessing of these transient thoughts for symptom improvement. More recent approaches, such as mindfulness based cognitive therapy (MBCT, Segal et al. 2012), have begun to integrate classic CBT approaches with mindfulness approaches. Given the functionalistic similarities that can be found between different Eastern and Western philosophical approaches, such as stoicism and mindfulness, future research taking a universalistic stance might benefit from exploring more explicitly how different systems of thought and their practices may overlap.

Rethinking Sati within Te Ao Māori

One of the most important concepts to Te Ao Māori (The Māori world) is whakapapa. Often translated as 'genealogy', a deeper meaning behind the word can be found in its two components 'whaka' to create and 'papa' a base or foundation. Whakapapa extends beyond western notions of genealogy as it links you to your ancestors and weaves you into the all-encompassing cosmological web. This web persists beyond the natural world as Māori recognise Te Ao Tinana (the physical world) and Te Ao Wairua (the spiritual world) as being intrinsically linked (for further insights into the Māori worldview please refer to: Marsden 2003). Whakapapa serves as the foundation for the Māori worldview as many of the cultural beliefs and practices stem from multidimensional and interconnected understandings of the universe (For a comprehensive breakdown of Māori traditions see: Mead 2016). The pepeha is an example of a Māori cultural tradition that reflects this interconnected worldview and is a formulaic expression of one's whakapapa. During the pepeha, a person is reciting one's historical lineage invoking tribal connections and ancestors as well as important locations. The structure itself is highly ritualised, requiring momentary attention and retrieving specific long-term memories. Culturally, in reciting your pepeha, ancestral links are made to maunga (mountains), awa (rivers), waka (canoes), iwi (tribes), hapu (sub-

tribes) and marae (meeting houses) that then foster an individual's tūrangawaewae (sense of belonging).

While reciting her pepeha an individual undergoes a grounding process as she remembers, reflects and acknowledges that which has paved the way for her existence, being the atua (deities) who reflect the many components of Te Taiao (the environment) and are regarded as her tūpuna (ancestors) (Mahuika 2019). The positionality and awareness a person gains from reciting their pepeha is important as it strengthens their connection to the world around them (Te Rito 2007). Through frequently practicing traditions like pepeha over time, one's perspectives of daily life can be influenced. For example, through repeated practicing of ancestor-focused lineages and even mythical associations embedded within a pepeha, an everyday observations such as seeing a bird like the Kākā (*Nestor meridionalis*) can shift the perception from viewing a mere bird to understanding the bird as respected child of Tumataika (personified deity of the Kākā bird) and therefore as an important ancestral figure being present at that moment (Best 2005). Therefore, some ritualistic practices in Te Ao Māori like the pepeha provide a structure to facilitate culturally shaped memory-processes that appear to be more aligned with original mindfulness dynamics around remembering and memory. Engagement with whakapapa acts to apply this interconnected awareness and parallels earlier conceptualisations of sati that describe it as a guiding process of remembrance (Gethin 2011). Further similarities between whakapapa and Sati can be seen in how both of these processes facilitate respective 'awakenings'. Buddhist practitioners such as Analayo (Anālayo 2004) discuss the recollective function of Sati as a means of awakening and this is akin to how an intimate spiritual understanding of whakapapa can help one become awakened to the ultimate reality from a Māori perspective (Marsden 2003).

These decentring processes seen in both Māori and Buddhist practices shift the focus away from the isolated, physical self towards more impermanent and spiritual self-understandings. These conceptual overlaps between sati and whakapapa provide a potential bridge between ideas from Te Ao Māori and Buddhism.

Previous literature has explored the interface between ideas from Te Ao Māori and mindfulness through the development of a culturally responsive MBSR programme (Ketu-McKenzie 2019). Ketu-McKenzie's work is most central here, as she identified MBI's to be an important treatment option for Māori because mindfulness approaches promote a more holistic and culturally relevant view of wellbeing and can help in further bridging the gap between the Māori and Western approaches to healthcare. This is especially important because Western therapeutic practices often serve as barriers for Māori and perpetuate the systemic health inequalities.

Focusing on some specific elements, one of the important Māori concepts in relation to the MBSR is that of hau (breath). Within modern therapeutic applications of mindfulness, breath work is one of the fundamental tools to help develop awareness of the present moment and ground oneself. As previously mentioned, Te Ao Māori recognises both Te Ao Tinana and Te Ao Wairua. This duality is reflected in the Māori language as words often also have a whakapapa wairua (spiritual origin), a second spiritual meaning (Pere 1991). Accordingly, hau can refer to the physical breath that fills your lungs as well as the breath of the divine spirit that is imparted into us by our wairua (Marsden 2003). The importance of hau is linked to the creation narrative of Hine-ahu-one (the first human being). In the most commonly known account, Hine-ahu-one was fashioned

out of the sacred earth of Kurawaka by Tāne Mahuta (god of the forests) and was brought to life when Tāne Mahuta pressed his nose against hers and breathed life into her (Whatahoro et al. 1997; Sharman 2019). This sharing of hau through the tradition of pressing noses and inhaling through the nostrils is called a Hongi and has become a ritualised way for Māori to spiritually connect with each other and the atua (Barlow 1991; Mead 2016). Implementing these understandings of the hau from Te Ao Māori through practices like the Hongi can provide new meaning and relevance to the existing mindfulness practices associated with the breath and within the context of existing MBI's that centrally involve breathing awareness and techniques.

Through the implementation and discussion of corresponding Māori customs with specific mindfulness practices including karakia (incantation), kōha (gifts), waiata (songs) and mihimihi (greetings), it becomes possible to contextualise and broaden standardised mindfulness programmes. Explaining and situating specific exercises and activities within Māori cultural practice can help Māori to understand these practices and recognise how they can fit with existing spiritual and cultural beliefs. Chanting is an example of a frequently used exercise in mindfulness practice that can be situated within the Māori practice of karakia. Karakia are employed in Te Ao Māori for a range of purposes and in an array of contexts. These purposes include when harvesting natural resources, performing spiritual rites and embarking on voyages or journeys. In many instances, karakia can be used as a grounding mechanism to help people focus on the task at hand. An example of this can be seen in how karakia are often recited before engaging in potentially dangerous practices like diving, as they can help a group get in the right headspace to respectfully and safely engage in a practice (for a more comprehensive breakdown of karakia see: Mead 2016 or Rewi 2010).

We can further connect MBI's to a Māori context by involving whānau (family members) and kaumatua (elders). The involvement of this wider network is crucial for establishing social support, relevance (see above for the discussion of culturally shared mental models for validating conscious experience) and culturally safe environments for the participants to meaningfully engage in mindfulness practice. This wider level of involvement reflects the more family and community based structure that Māori wellbeing is intimately tied to (Durie 1998). The importance of embedding mindfulness practices into Te Ao Māori has also been discussed in mindfulness conferences that have described mindfulness practices being used by Māori as a means of healing through its strengthening of the connection between Te Ao Wairua and Te Ao Tinana (Ketu-McKenzie 2019). This outcome is of great importance as according to the Māori worldview, we are spiritual beings first, having a physical and human experience second (Marsden 2003).

Further developments and changes to existing mindfulness programmes could foster self-understanding and self-awareness in Māori through the medium of traditional pūrakau (stories). Historically, storytelling has been critical in passing down mātauranga (Māori knowledge) and has now become a focus for a number of interventions that seek to improve Māori wellbeing (For innovating work that already does this see: Kopua et al. 2020). This storytelling approach could be applied in the present context by adapting and modifying existing MBI's to fit the narrative structure of various pūrakau. The M3 Mindfulness for Children programme illustrates how this combination of mindfulness and pūrakau can converge to improve the wellbeing of children (Te Patu 2019). This programme provides in-classroom meditation and yoga classes that have pūrakau and other

Māori concepts interwoven throughout. Together with Ketu-McKenzie's groundbreaking work, this programme excellent reference points for those wishing to integrating Māori cultural perceptions and practices within existing MBI's. Our view is that many Māori traditional practices and customs include elements that are compatible with both historical and contemporary notions of mindfulness, opening synergistic windows for reconnecting and strengthening cultural traditions and improving health and wellbeing.

Concluding remarks

We reviewed recent evidence and discussions around the concept and the effectiveness of mindfulness for mental health. We presented an overview of previous meta-analyses of mindfulness, demonstrating their overall effectiveness. An analysis of keywords and abstracts of mindfulness meta-analyses shows a preoccupation with evidence-based practice and little concern with cultural questions. This is of interest, as a culturally distinct practice rooted in Buddhist traditions seems to have been adopted at least in name globally. We review some discussions of the origin of the mindfulness concept which suggest that the concept may have had a broader memory focus while more contemporary Western emphasise centre more narrowly on attention. The core argument we develop out of this disconnect between cultural practice and universal effectiveness is based on predictive coding models, that allow integration of both biologically derived universal processes and culturally shaped meaning systems. We propose that adopting a more structured approach embedded in the predictive coding framework might help to re-integrate bottom-up biological and functionalist perspectives and top-down cultural and meaning-making focused perspectives on mindfulness and explain both the cultural variability and biological universality. As examples, we provide examples from Greek philosophy and Māori cultural practices to show how diverse practices may feature essential mindfulness components from both Buddhist and more contemporary interpretations, without explicitly developing a cultural theory of mindfulness in each context. These similarities nevertheless explain why the practice can appear meaningful and helpful to individuals in distinct cultural contexts. By taking this perspective, we believe we offer new opportunities for rethinking mindfulness for both more targeted and specific research as well as more meaningful implementation of mindfulness within specific cultural contexts. Cultural differences in understanding mindfulness as a concept and the applicability of mindfulness interventions is still a developing field that needs to be addressed to maximise the benefits of current practices for all.

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