



## DOCTOR OF CLINICAL PSYCHOLOGY (DCLINPSY)

### Doctorate in Clinical Psychology: Main Research Portfolio

**1) Standardised measures of mindfulness practice quality: a systematic review; 2) Senior staff perceptions of trauma-informed care in an NHS mental health trust; 3) Does information about health benefits of mindfulness influence mindfulness attitudes, intentions and practice? An online experiment.**

Fordonnell, Marike

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# Research Portfolio Submitted in Part Fulfilment of the requirements for the Degree of Doctorate in Clinical Psychology

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## Main Portfolio:

*1) Standardised measures of mindfulness practice quality: a systematic review; 2) Senior staff perceptions of trauma-informed care in an NHS mental health trust; 3) Does information about health benefits of mindfulness influence mindfulness attitudes, intentions and practice? An online experiment.*

Volume 1

Marike Sophie Fordonnell

Doctorate in Clinical Psychology  
University of Bath

Department of Psychology

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## ABSTRACTS

### Literature Review

To promote the effectiveness of mindfulness-based interventions (MBIs), it is important to understand their active ingredients. Mindfulness home practice has been suggested as a key ingredient of MBIs, however the evidence is mixed for mindfulness practice directly predicting mental health outcomes, with identified issues with the variable ways mindfulness practice quantity has been measured. A potential alternative measure of mindfulness practice engagement is practice quality; the degree to which one engages with the principles and skills of mindfulness whilst meditating. Initial literature suggests that practice quality may predict psychological functioning, however to understand its role in MBI outcomes, it is important to develop conceptually and psychometrically sound measures. This review aimed to review measures of mindfulness practice quality, including their psychometric properties and use in the literature to date. Three electronic databases were searched, with results screened by two independent reviewers, and conflicts resolved with reference to inclusion criteria. Psychometric properties and quality of included studies was assessed with the QuADs and Terwee criteria. 70 studies met full inclusion criteria; including 19 self-report, behavioural task or physiological observation measures. Psychometric properties and quality of studies was variable, with no single measure recommended. Future research should aim towards developing a consistent conceptualisation of mindfulness practice quality, including stakeholders, and validating measures across diverse samples; practitioners should consider the frequency of use, the fit between how measures and interventions conceptualise mindfulness, and the psychometric properties; using more than one measure, where possible.

### Service-Related Project

Research indicates that experiences of trauma (exposure to a horrific event or set of events) is common among mental health staff and service users. Trauma informed-care (TIC) is a way of providing care informed by understanding of how trauma affects biological, social and psychological development, and aims towards building safety and trust. Emerging evidence suggests TIC can improve staff and service user satisfaction, while reducing unplanned discharges and use of restraint. The aim of this study was for an NHS mental health Trust to measure to what extent they currently provide TIC, to identify opportunities for future development.

### Method

Twenty-three team managers or equivalents completed the Trauma-Informed Organisational Self-Assessment, a 135-item questionnaire on different aspects of TIC. Participants also answered: 'has your team been actively working towards becoming trauma-informed?' as well as providing any other comments. The project was approved by the Quality Improvement Team.



## Findings

The team managers sampled on average agreed that the Trust provides trauma-informed care. Three areas with lower agreement include involving former service users, reviewing policies and providing training and education on TIC. Many teams reported working towards providing TIC, however barriers included lack of training, lack of time, and lack of TIC in partner organisations. Response rates were somewhat below average for the Trust, possibly due to the questionnaire's length and time pressures within services. These findings provide a baseline of perceptions of Trauma-Informed Care, to be re-evaluated after future training and development within the Trust.

## Main Research Project

With the benefits of mindfulness-based interventions well-established, an emerging direction for research is understanding factors which promote adherence to MBIs. While little clear evidence is available to support the use of existing adherence promotion strategies such as reminders, personalisation of content, or progress tracking, an alternative strategy which has received less attention is providing information about the health benefits of mindfulness. This study aimed to understand whether providing such information (in narrative and statistical formats) could influence attitudes, intentions and motivation towards mindfulness, as well as practice adherence and downloading of a practice audio. 97 university students were randomised to receive mindfulness health benefit information or no information. They then had the opportunity to complete a guided practice (with adherence measured by duration on this page) and download this practice, alongside completing measures of attitudes, intentions, and motivation towards mindfulness practice. Findings suggest that those who received the health benefit information reported more positive attitudes towards mindfulness practice, and greater intentions to practice in the next week. No advantage of health benefit information was found for motivation, practice adherence or downloading behaviour. Implications for practitioners and directions for future research are discussed.

# LITERATURE REVIEW

*Standardised measures of mindfulness practice quality: a systematic review*

**Marike Fordonnell**

[msod20@bath.ac.uk](mailto:msod20@bath.ac.uk)

**Supervisor:** Prof. Paul Chadwick

Target journal: Mindfulness. No specific wordcount, but no more than 35 pages double spaced. Impact factor = 3.8. Chosen because its scope includes reliability and validity of assessments of mindfulness.

**Word count:** 7435

**Date:** 24.05.2024

## Introduction

Mindfulness has been defined as ‘the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment’ (Kabat-Zinn, 2003, p.145). Mindfulness-based interventions, such as Mindfulness-Based Stress Reduction programs, have proliferated in recent years; they are increasingly offered in physical and mental health services, for people experiencing chronic pain, cancer, psychosis, addiction, eating disorders and other presentations. Following extensive evaluation, mindfulness interventions have a sound evidence base. Meta-analyses and systematic reviews have found these programs produce small-moderate effect sizes for stress, depression, anxiety, mindfulness and wellbeing in clinical and community samples (Jayawardene et al., 2017; Sevilla-Llewellyn-Jones et al., 2018; Sommers-Spijkerman et al., 2021) and mindfulness therapies are now recommended as a treatment for mild depression in the National Institute for Health and Care Excellence guidelines (NICE, 2022).

With evidence for the benefits of mindfulness well-established, research is beginning to focus understanding on dismantling mindfulness interventions, to understand their active ingredients. If known, this understanding could contribute not only to the basic science understanding of mindfulness, but towards enhancing the effectiveness of mindfulness interventions. A recent systematic review (Stein & Witkiewitz, 2020) found eight component studies investigating the active ingredients of mindfulness interventions, highlighting that two important factors may include acceptance and awareness combined, and training in mindfulness meditation. The review found that interventions including both awareness and acceptance were associated with increased positive affect, less negative affect, and improvements in stress and social interactions, compared to interventions focusing on awareness alone (Chin et al., 2021; Lindsay et al., 2018). This supports Monitor and Acceptance Theory, the idea that monitoring and acceptance are both necessary to promote improvements in emotion regulation, and that monitoring without acceptance may increase distress (Lindsay & Creswell, 2017). With regards to mindfulness meditation training, two studies within the review suggested that the full mindfulness-based cognitive therapy program (MBCT) (including meditation training and practice), is associated with improved outcomes over and above active control interventions that were matched to MBCT, but that lacked meditation training and practice (Chiesa, 2013; Williams et al., 2021). As such, mindfulness practice was concluded to be an active component of mindfulness-based interventions.

However, despite the evidence for the efficacy of mindfulness interventions (Sevilla-Llewellyn-Jones et al., 2018; Sommers-Spijkerman et al., 2021) and the evidence from dismantling trials that mindfulness practice may be an active ingredient (Stein & Witkiewitz, 2020), the evidence is less clear for mindfulness home practice directly predicting mental health benefits. Vettese et al. (2009)’s systematic review found that thirteen trials provided evidence for home practice influencing mental health outcomes, while eleven did not. Similarly, Lloyd et al. (2018)’s systematic review found four of the seven reviewed trials report evidence for home practice predicting improved clinical outcomes.

One possible explanation for the inconsistent relationship between mindfulness practice and clinical outcomes, is how home practice is defined, operationalised and measured within this literature (Lloyd et al., 2018; Vettese et al., 2009). While definitions are frequently absent, measurement of home

practice adherence is highly variable from study-to-study, and can include self-reported frequency or duration of practice, number of log-ins to a mindfulness website or app, number of clicks on a meditation website, or duration of mindfulness audio played in an app (Ribeiro da Silva dos Santos, 2023; Winter et al., 2022). Research indicates that self-reported practice duration frequency can be unreliable and liable to inflation, and even experience sampling does not provide significant improvements compared to retrospective self-reports (Flett et al., 2019). Perhaps in response to these concerns, objective measures (e.g., number of minutes of audio played) are becoming increasingly common; however, these are in turn problematic in that number of minutes played cannot tell us about the quality of engagement, or whether engagement has occurred at all.

Given these barriers to measuring practice adherence, an alternative approach is to evaluate the quality of practice. Practice quality may be understood as the degree to which a person engages with the principles and skills of mindfulness during a meditation practice, such as present moment attention and acceptance (Goldberg et al., 2020). Ericsson's learning theory suggests that effortful practice, as opposed to informal engagement, is a key factor in skill acquisition (Ericsson et al., 1993). Applying this to mindfulness, Del Re et al. (2013) suggest that quality of mindfulness practice engagement may prove more important to clinical outcomes than quantity of practice. Initial research supports this idea; Goldberg et al. (2014)'s mindfulness intervention trial found that practice quality predicted improvements in psychological functioning at post-treatment and follow-up, while controlling for practice quantity. Similarly, in an MBSR trial, Goldberg et al. (2020) found that practice quality mediated the link between practice quantity and psychological functioning, with a further study finding that practice quality improved most for those who also had the greatest improvements in state and trait mindfulness, stress and anxiety (Strohmaier & Goldberg, 2024). However, others found no effect of practice quality on outcomes (Strohmaier et al., 2021), concluded their measure may not capture practice quality, and warned that measurement inaccuracy may limit understanding of how practice quality may affect clinical outcomes (Parsons et al., 2017; Ribeiro et al., 2018).

If practice quality is found to predict clinical outcomes in mindfulness-based interventions, this could open new directions of research, such as understanding determinants of quality of practice, thereby informing support of individuals in accessing the benefits of mindfulness interventions. However, if this research is to avoid the difficulties in cross-comparison of the mindfulness practice quantity literature, it is important to develop conceptually sound measures with strong psychometric properties. Researchers are beginning to develop standardised measures of practice quality (e.g., Del Re et al. (2013); Hassed et al. (2021); Hadash et al. (2023)), however a systematic review of these is currently lacking. Previous systematic reviews have reviewed measures of informal practice or trait mindfulness, or reviewed practice adherence rates, associations between adherence and clinical outcomes, or engagement strategies to promote adherence (Baydoun et al., 2021; Park et al., 2013; Parsons et al., 2017; Ribeiro da Silva dos Santos, 2023; Winter et al., 2022). However, to our knowledge, there has been no review of measures of mindfulness practice quality, or attempt to compare their psychometric properties or how they have been used in the literature. To address this gap, this review aims to answer the following questions:

1. What standardised measures currently exist for measuring mindfulness practice quality?
2. What are the psychometric properties of these measures?
3. How has each measure been used in the research literature to date?

## Method

### Search strategy

Searches were undertaken using the following databases: PubMed, APA PsycNet and Web of Science on 22nd July 2023. Search terms related to 'mindfulness', 'practice' and 'measure' were used (see Appendix A for full search details) and the search strategy was designed in collaboration with a psychology librarian. Where the search results yielded a measure, but not the original article introducing this measure and outlining its development and psychometrics, this original paper was manually located through Google Scholar.

### *Inclusion criteria*

- Publication in a peer reviewed journal
- Article available in English
- Article based on or including the development or use of a standardised measure of formal mindfulness practice quality

### *Exclusion criteria*

- Not available in English
- Full text not available (in Google Scholar, library catalogue searches, and contacting the author)
- Meta-analysis, review, chapter, thesis or dissertation
- Qualitative studies of mindfulness experience (that do not include a measure)
- Study protocol
- Measure of an alternative practice (e.g., measure of loving kindness meditation)
- Measure of informal practice (e.g., mindful dishwashing, mindful eating)
- Measures of mindfulness practice frequency or duration, but not quality
- Measures of trait mindfulness
- State measures unrelated to mindfulness (e.g., mood)
- Measures of a related construct, but not mindfulness (e.g., equanimity)
- Studies without a current measure of practice quality (e.g., studies that correlate neuroimaging results with calm states or list measuring practice quality as a future development aim, but do not present such a measure within the paper).
- Studies that use state measures of mindfulness, that are not tied to mindfulness practice (e.g. state measures in experience sampling studies may measure state mindfulness at times throughout the day, rather than being connected to mindfulness practice specifically, therefore this application is not related to mindfulness practice quality).

As our review was concerned with the availability of measures of mindfulness practice quality, and how these have been used within the published literature, we limited our search to published journal articles (as opposed to grey literature). Within this, we chose to exclude informal practice (e.g., mindful eating, mindfulness in other daytime activities), as a doctoral dissertation has been written on this recently (Ribeiro da Silva dos Santos, 2020). Given we were not specifically interested in finding measures used with a particular population, or used in a particular time period, we placed no restrictions on dates of publication (in practice, most studies in this review were published post-2000)

or on population, with participants in the included studies including university students, individuals with mental or physical health difficulties, and community populations.

#### *Study selection and data extraction*

The 8150 articles identified from the database searches were imported into Covidence, where M.F., K.L., M.M. and D.P. completed the title and abstract screening, and M.F., K.L., and M.M. completed the full text screening, with every study independently screened by M.F. and one other reviewer. Conflicts were resolved between M.F. and the other reviewer in weekly meetings, with final consensus guided by discussions regarding the inclusion and exclusion criteria.

A data extraction table was created in Excel, to extract data relating to measure characteristics, psychometric properties of measures, study characteristics, and quality assessment of included studies. Measure characteristics included assessment method (self-report, behavioural task, physiological observation), number of items, concepts measured, subscales, scoring scale, frequency of use in the literature, participant profile (including sample size, gender and age range), and setting of use (online, laboratory task, in person task or survey, or other). Study characteristics included sample size, gender, age range, ethnicity, meditation experience, any other participant characteristics, recruitment strategy, inclusion/exclusion criteria, and location of study. Psychometric properties and quality assessment data extracted are described below.

#### *Psychometric property assessment of included measures*

To assess the psychometric properties of the quality of mindfulness practice measures, this review uses the quality criteria for measurement properties of health status questionnaires proposed by (Terwee et al., 2007) (see Appendix B for a full description of these criteria, including definitions and a guide to ratings). These criteria include content validity, internal consistency, criterion validity, construct validity, reproducibility (including agreement and reliability), responsiveness, floor and ceiling effects, and interpretability. Each of these areas is given a rating of either positive (+) that indicates the criteria have been fully met, indeterminate (?) which indicates the criteria have been partially met, or this is unclear, negative (-) that indicates the criteria have not been met, or (0), that indicates that no information has been found on this area.

The Terwee et al. criteria have been used in systematic reviews that contain psychometric evaluations of health measures related to mindfulness practice quality, including measures of compassion (Strauss et al., 2016), psychological flexibility (Cherry et al., 2021), and self-reported mindfulness (Park et al., 2013). The range of psychometric quality criteria, the use in other systematic reviews of related measures, and the clear criteria make this an appropriate approach for the present review.

#### *Quality assessment of included studies*

To assess the quality of included studies, we used the Quality Assessment for Diverse Studies (QuADS) criteria (Harrison et al., 2021). The thirteen quality criteria assessed include theoretical or conceptual underpinning to the research, statement of research aims, clear description of research setting and target population, appropriate study design to address aims, appropriate sampling to address aims, rationale for choice of data collection tools, appropriate format and content of data collection tool for addressing the aims, description of data collection procedure, recruitment data provided, justification for analytic method, appropriate analytic method to address aims, stakeholder involvement in research design or conduct, and critical discussion of strengths and limitations (see Appendix C for full criteria descriptions). Each criterion is scored as 0 (no mention at all), 1 (partially met criteria), 2 (met

criteria, but detail is lacking) or 3 (criteria is fully met, and in detail). As there are thirteen criteria, this gives a maximum score of thirty-nine per study, however, study quality should be assessed at the individual criterion level, rather than relying on total scores – doing so can also facilitate understanding of trends in the literature, for example which quality criteria tend to be met or unmet within and across measures (Harrison et al., 2021).

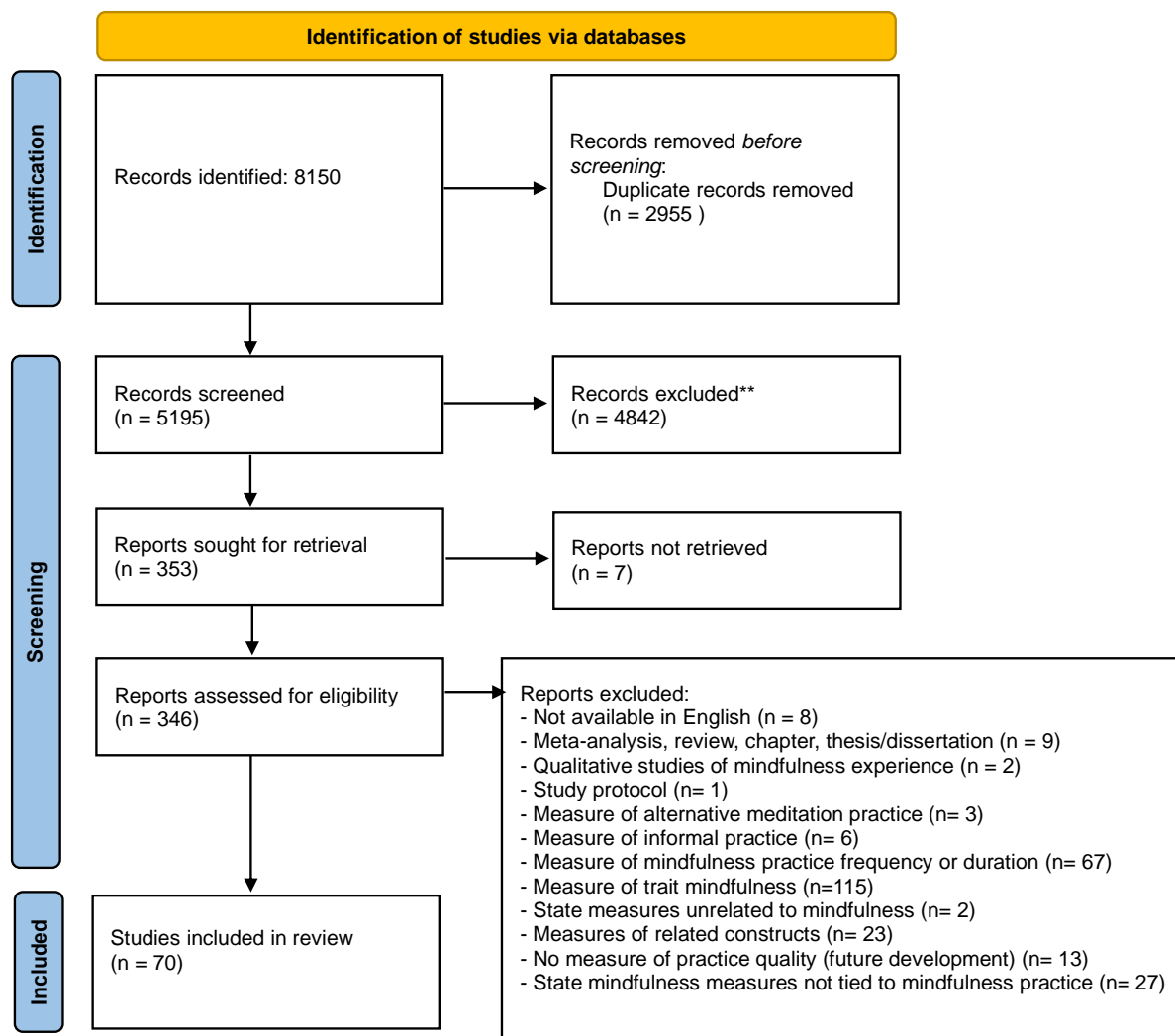
This tool was selected because the studies identified in this review include a range of assessment methods, and settings; using the QuADS facilitates the assessment of quality across these varying study designs and measure types.

### *Data Synthesis*

In addition to providing a synthesis of the psychometric properties (see above), this review provides a narrative synthesis to answer the three key review questions, relating to what measures exist for measuring mindfulness practice quality, the psychometric properties of these measures and how they have been used in the literature.

## Results

The systematic search yielded 8150 articles across three databases. Of these, 2955 were removed as duplicates, and 5195 underwent title and abstract screening. Of these, 353 were selected for full text screening, and 70 articles met the full inclusion criteria (see Figure 1 for PRISMA diagram).



**Figure 1**  
Prisma diagram



## 1. What standardised measures currently exist for measuring mindfulness practice quality?

This review found nineteen measures of mindfulness practice quality. The majority of these were measures of self-reported mindfulness practice quality; fewer measured mindfulness practice quality with a behavioural task, and a small minority measured mindfulness practice quality with a physiological observation. The measures included seventeen distinct conceptualisations of mindfulness (or meditation) practice quality. A majority of measures conceptualised mindfulness practice quality in terms of attention, while just under half used awareness. The remaining fifteen concepts were used sporadically, with six included in 10-20% of measures, and ten included in just one (5%) of practice quality measures. This review finds the three key types of measure (self-report questionnaire, behavioural task, physiological observation) demonstrate important conceptual as well as methodological differences; as such, the characteristics, advantages and disadvantages of each measure type are discussed in turn.

### *Self-report questionnaires*

Thirteen self-report questionnaires were found. Within these, there are two main ways of assessing mindfulness practice quality. Firstly, and by far the most commonly used in the literature to date (see research question three below), is to complete a state mindfulness measure with reference to a just completed practice. Six measures were found which measure mindfulness practice quality as a 'state' in this way. Secondly, one can measure mindfulness practice quality by asking participants to self-report the quality of their mindfulness practice generally, rather than in relation to a recent practice. Seven measures were found which use this more 'trait'-like assessment of practice quality. Another way of distinguishing self-report scales is their focus on mindfulness specifically, or inclusion of other meditation types. Some of these inclusive meditation measures explicitly highlight kinds of practice relevant to their measure (e.g., mindfulness, contemplation, or concentration in the Meditation Depth Questionnaire), while others do not provide this detail, thereby leaving it to the user to decide whether their practice is relevant. While there are exceptions (e.g., the Meditative State Scale measures quality of a recent meditation practice), generally the mindfulness-specific scales tend to measure practice quality in a 'state'-like way, while the scales of meditation practice tend to enquire as to practice in general, thereby providing a 'trait'-like measure.

These distinctions are important, not only for practical use, but in relation to conceptualisation. Overall, a majority of self-report measures conceptualised practice quality in terms of attention, with awareness, phenomenology and transcendence the next most common conceptualisations used by a minority. Attention and awareness were most frequently used in mindfulness-specific questionnaires (e.g., FFMQ), and tended to be 'state'-like measures, used to measure practice quality following a specific practice. Phenomenology and transcendence were used as conceptualisations by questionnaires that measured quality of meditation practice, rather than mindfulness practice specifically. These questionnaires tended to ask about typical practice, or practice overall, rather than a specific, recent practice. Mindfulness researchers or clinicians evaluating mindfulness may prefer a mindfulness-specific rather than meditation-general measure to ensure the questionnaire's conceptualisation of practice quality matches their own, and may not wish to 'muddy the waters' by including other concepts in a meditation-general measure (e.g., transcendence). However, as most of

the meditation-general questionnaires include subscales, another option is to retain only the relevant subscales, though in such cases the factor structure and psychometric consequences of using subscales rather than the full scale should be considered.

Advantages of self-report approaches include ease of administration, with their accessible nature meaning these questionnaires have been used in laboratory settings, online and in other in-person settings. They also typically tap into multiple domains of practice quality, which may help give a broad estimate of practice quality, rather than relying on one dimension alone. Disadvantages include that by relying on self-report, these measures are open to the same critiques as self-reported mindfulness adherence, or self-reported trait mindfulness. Firstly, self-reports may be subject to recall bias, and inflation (Flett et al., 2019). Secondly, they may be affected by expectancy effects or socially desirable responding; if someone has undertaken a mindfulness intervention, and is expecting a benefit, or wants to show gratitude for the intervention, this may be reflected in overly positive practice quality scores (Grossman, 2011). Thirdly, there may be issues with the language of the measures – either that people over a course learn the language of mindfulness, therefore learn the ‘right answers’ and choose these because they value mindfulness, rather than this reflecting on their practice quality, or as the measures do not have a way of checking a person understands the terms used, people may rate their practice quality without an understanding of what this means (Grossman, 2008). Lastly, even supposing people are not motivated to present a more positive picture of their practice, supposing they are familiar with the terms but are trying to rate their practice rather than their attitudes towards mindfulness, and understand the terms used, there are potential problems with interpretation. That is, the ability to accurately report one’s degree of practice quality may rely on a person’s skills in mindful awareness, or state mindfulness at the time of self-report (Davidson & Kaszniak, 2015; Van Dam et al., 2018) – a novice meditator may rate a practice differently compared to an expert meditator, which further calls the content validity of these measures into question, given that a large proportion of these measures are validated on novice meditator samples, typically after a 6-8 week course (Grossman, 2008, 2011; Smallwood et al., 2007).

### *Behavioural Tasks*

The four behavioural tasks measure mindfulness practice quality using breath-counting, reporting of mind wandering and determining the number of beats in a metronome rhythm. Of the behavioural tasks, the metronome task appears the most ‘purely’ behavioural, while the other three also rely on self-report to some degree, e.g., the verbal or written reporting of experiences while practicing meditation.

The behavioural tasks without exception conceptualised mindfulness in terms of attention, awareness or both, measured by attention to breath, inner experience or a metronome rhythm. This may relate to the developer’s more specific approach to the meaning of mindfulness, or to that these concepts may be more easily captured behaviourally compared to others such as curiosity or acceptance. The advantages of behavioural tasks include that these may be seen as more objective measures of practice quality, as the tasks measure attention during the practice itself, rather than relying on recall or global reports. It should be noted that behavioural tasks cannot necessarily be purely objective, as these too will tend to rely on self-report to an extent, i.e., reporting of one’s experiences during the practice. A disadvantage of these measures is ease of administration – while a few studies are beginning to translate these measures into online settings, they are mostly used in laboratory or other in-person settings (Frewen et al., 2016; Hadash et al., 2023; Hunkin et al., 2021). Adaptation to online

work is possible, however, in some cases may require specialist software or programs, which could preclude more widespread use. Another disadvantage is that these tasks tend to offer a limited conceptualisation of practice quality by mainly measuring attention and awareness, rather than other aspects which may be more difficult to measure through key presses during a practice. Lastly, there is also the question of whether or what extent needing to press a button at regular intervals, or regularly come out of practice to self-report on one's experience may disrupt practice quality itself.

### *Physiological observations*

The two physiological tasks have idiosyncratic conceptualisations of practice quality. The Mindful Watch measures breathing timing and progress, conceptualising practice quality in terms of respiration, while body movement analysis measures body movement during practice, with its developers offering the rationale that expert meditators tend to move less in practice, thus offering body movement as a marker of practice quality. Advantages of these kinds of measures include providing an objective measure, not influenced by recall bias. Potential disadvantages include that it is unclear whether body movement or respiration would be commonly considered to be markers of mindfulness practice quality by mindfulness practitioners or researchers. Furthermore, if participants were aware of the data the measure is capturing as a measure of practice quality, they may strive to keep still or breathe evenly without adopting the principles of mindfulness, which could render the measure less useful as an indicator of practice quality.

## 2. What are the psychometric properties of these measures?

With regards to psychometric properties, overall, content validity and construct validity are strengths of many of the current measures evaluated. For content validity, a number of measures fully met criteria by having clear descriptions of aims, population, concepts and item selection, and having the target population and investigators or experts involved in the item selection or measure development. Similarly, many measures showed good construct validity in having specific hypotheses about how their measure relates to other constructs, with a majority of results in support of these hypotheses. Measures of practice quality tended to have variable internal consistency, with some measures demonstrating Cronbach's alpha within the expected range for their measure, others showing scores outside of the expected range, or providing no information on this. Criterion validity tended towards being indeterminate, or as having no information provided – this is likely a less applicable psychometric property for measures of practice quality at this point, because there is no accepted gold standard of mindfulness practice quality. Very few measures provided information about reproducibility (in terms of agreement or reliability) or floor and ceiling effects, perhaps due to many measures being in the initial stages of development. Lastly, no study met full criteria for responsiveness or interpretability, because these properties refer to clinically important changes over time and the degree to which qualitative meaning can be provided to quantitative scores. As there is no agreed upon definition of practice quality, there has been no attempt in the studies in this search to define a minimal important change in this construct – this therefore presents a barrier to evaluation of responsiveness and interpretability. While some studies partially met the criteria for interpretability by having means and standard deviations for at least four relevant subgroups (e.g., female and male novice and expert meditators), until some level of consensus is reached about how to operationalise practice quality, a minimal important change for practice quality for mindfulness-based interventions will remain out of reach.

Psychometric properties across the three main kinds of measures were largely similar, with few differences except that behavioural tasks and physiological observations were unable to score positively on internal consistency, because they lack the set items of self-report measures; therefore this criterion is less useful in their evaluation. The other observed difference was that unlike most self-report and behavioural task measures, which scored positively for construct validity, the physiological observation measures were rated as indeterminate for construct validity, because they were found not to test (or find support for 75% or more of) theoretically derived hypotheses – this is likely due to the papers concerning their development focusing on their technical development, and no further usage in the literature as yet. That the Terwee criteria are more relevant for some kinds of measure than others is a limitation, and is further discussed in the limitations below.

To further understand these measures, it is also helpful to understand the quality of the studies that have used them. With regards to quality of assessed studies, the developers of the Quality Assessment for Diverse Studies tool advise total scores for studies are inadvisable, and synthesis with this data best functions by understanding trends in the literature across different quality domains (Harrison et al., 2021). With this in mind, the included literature has a number of strengths and limitations in quality. Studies tended to consistently show a good theoretical underpinning, and generally provided a clear research aims statement. The study design tended to be appropriate for the aims, with the format and content of the collection tool equally appropriate. The methods of analysis generally appeared appropriate, given the aims. The literature was variable in quality with regard to clearly describing the setting and population, with many studies doing this clearly, but limitations in detail in the others. Similarly, while a number of studies demonstrated clear consideration of their sample requirements and linked this to their aims, in others this detail was missing, for example presenting a convenience sample of university students, without justification of why this sample was appropriate for the research aims. Equally variable were the rationale for choice of data collection tool, the description of data collection procedure, the provision of recruitment information and the consideration of strengths and limitations. Finally, the main limitations of this literature are justification for analytic method selected, and consideration of stakeholders in the research design and conduct. Justification of analytic method was largely absent for most studies, which could relate to (similar to other quality criteria where information is missing or lacking detail) a limited wordcount and prioritising other aspects, or an assumption that the rationale for using particular statistical methods is common knowledge, and does not need to be justified. Similarly, stakeholders were considered in only a minority of studies, which perhaps reflects the state of psychological literature more generally, in that stakeholder involvement in research design or materials is a relatively recent development in psychology's history. Reflecting growing improvements in this area, the minority of studies involving stakeholders were largely published in the last five or so years, and where inclusion was done, it tended to be done well, meeting full criteria for substantial consultation with stakeholders, including in planning the study design or preliminary work. Thus, the research literature shows good quality in four of the criteria, variable quality in six, and limited quality in two.

### 3. How has each measure been used in the literature to date?

Self-report measures have been used in laboratory settings, online and in person surveys; of these laboratory settings have been the most common. Including the original studies that develop and validate them, these measures have been used between 1-26 times. The most commonly used questionnaire is the Toronto Mindfulness Scale (Lau et al., 2006), followed by the State Mindfulness

Scale (Tanay & Bernstein, 2013), and the Mindful Attention Awareness Scale – state version (Brown & Ryan, 2003). This could suggest that evaluating mindfulness practice quality (rather than meditation generally), and evaluating this in a state-like measure, in relation to a recent practice, has been the approach most favoured by the literature, possibly because such scales were specifically developed in relation to mindfulness, and their focus on a practice just completed makes them suitable for experimental designs, including randomised control trials of mindfulness-based interventions. Alternatively, the popularity of this kind of measure could be explained by that many of these measures were developed 10-20 years ago, while a number of the measures of meditation practice quality generally have only been developed in the last five years. Supporting this reading is that mindfulness practice quality itself is a newer focus in research compared to trait and state mindfulness, and that many studies (outside of this review) have used state mindfulness measures not in relation to practice quality; therefore, being established measures in mindfulness research may make researchers more confident in using them for a practice quality application, compared to using newly developed scales. With regards to participant profile across these uses, participants are generally predominantly female, ages usually range across adult years (two measures have been used with under-18s) and total sample size across the studies for each questionnaire ranges from 50 to 5485 participants.

Of the behavioural tasks, the most commonly used measure is the Breath Counting Task (Levinson et al., 2014), which is the fourth most used measure of practice quality overall. Behavioural tasks have been used from between 22-830 participants, including mostly female adults. They have been used in between 1-6 studies, and have generally been used in laboratory settings, with the exception of one online setting. Part of the Breath Counting Task's relative popularity may be explained by its conceptualisation including both attention and awareness, or its simplicity of task; similarly to the self-report measures, this may also reflect it being one of the first-developed behavioural measures of practice quality, with others only published in recent years.

Each physiological observation has so far only been used once in the published literature from our search, with few participants (11-17), and in online (participants using an app) and laboratory settings. From our review, neither has currently been used beyond the initial study of its development, however this may change in future. As one of these measures is part of an app (therefore accessible to those with smartphones), future development of these new technologies could, similarly to behavioural tasks, be used in mindfulness based intervention trials to provide more objective feedback about practice quality, however this may be hindered without thorough consideration of conceptualisation, and making links back to the theory of how these observations may relate to quality of practice.

Overall, self-report measures of state mindfulness, used after a practice, are the most commonly used measures of mindfulness practice quality in the literature to date, and have been used across online, laboratory, and other in person settings. Their ease of administration may contribute to their usage, while the established status of the three most commonly used scales here in mindfulness research generally may contribute to their frequency of use within practice quality research. Behavioural tasks are the next most commonly used measure type, with physiological observations least used at present, though as technology continues to develop, this may change in future.

Characteristics of included measures and their participant profiles are detailed in Table 3. Psychometric qualities of these measures are included in Table 4.

**Table 3***Measure characteristics and participant profile, by frequency of use of measure.*

Name of measure	Assessment method	N items	Concepts measured	Subscales	Scale	Frequency of use	Participant profile <sup>1</sup>	Setting of use
<i>Self-report questionnaires</i>								
Toronto Mindfulness Scale (TMS) (2006)	Self-report	13	Acceptance, Openness to experience, Curiosity, Decentering	Curiosity, Decentering	0-4	26	5485 (49% F), 16-77	Laboratory task (20), Online (6), Other (3)
State Mindfulness Scale (SMS) (2013)	Self-report	21	Attention, Awareness, Curiosity	Mindfulness of mind, mindfulness of body	1-5	19	2748 (68% F), 18-67	Laboratory task (14), In person survey (1), Online (2)
Mindful Attention Awareness Scale State version MAAS-S (2003)	Self-report	5 <sup>2</sup>	Attention, Awareness	Unidimensional	0-6	9	1108 (69% F), 13-69	Laboratory task (5), online (1) and in person survey (1). other (2)
Meditation experiences questionnaire (MEQ) (2011)	Self-report	13	Phenomenology	Unidimensional	1-5	4	1451 (67% F), 18-23	In person survey (2), laboratory task (1), online (1)

<sup>1</sup> Sample size (gender), age-range<sup>2</sup> 7-item version also exists

Practice Quality - Mindfulness (PQ-M) (2013)	Self-report	7 or 6 <sup>3</sup>	Attention, receptivity	Attention, Receptivity	0-100	4	318 (73% F), 21-72	Laboratory task (1), In person survey (1), online (1), Other (1)
Meditation Depth Questionnaire (MEDEQ) (2001)	Self-report	30	Attention, Transcendence, Other	Hindrances, relaxation, concentration, transpersonal qualities, non-dual qualities	1-5	3	1394 (62% F), 17-88	Laboratory task (1), online (1) in person survey (1)
Mindfulness Adherence Questionnaire (MAQ) (2021)	Self-report	12	Attention, Acceptance	Formal practice quantity, formal practice quality, informal practice quality	0-6	2	647 (60% F), 18.5	In person survey (1), online (1)
Meditation Depth Index (2001)*	Self-report	3	Attention, Transcendence, Other	Hindrances, relaxation, concentration, transpersonal qualities, non-dual qualities	N/A	1	84 (73% F) 57.8	Online (1)
Meditative State Scale (2022)	Self-report	43	Cognitive, Affective, Somatic, Transcendence	Difficulties, mental quietening, transcendence	1-5	1	241 (73% F), 30.98	Online and laboratory task (1)
Neurophenomenological experiment MIMOSA self-	Self-report / Behavioural Task	6	Phenomenology	Capacity to apply meditation instructions, stability of mind, clarity of mind, aperture of	1-7	1	50 (NR), 35-65	Laboratory task (1)

<sup>3</sup> 6-item version is considered the revised version

report data (no name given) (2019)				field of awareness, awareness of body sensations, wakefulness				
Self-reported meditation quality (no name for scale) (2021)	Self-report	NR	Phenomenology	Physical relaxation/comfort, mental relaxation/comfort, attentional stability, attentional vividness	1-5	1	60 (53% F), 22-69	Laboratory task (1) and other (1)
Time Flow Mindfulness Questionnaire (2022)	Self-report	42	Attention, Awareness phenomenology	Before practice, during practice, short-term benefits, long term benefits, benefits at work	1-5	1	199 (70% F), NR	Other (1)
Two items for each facet of FFMQ (2015)	Self-report	10	Attention, Awareness, Describing, Non-reactivity, Non-judgement	Attention, awareness, describing, non-reactivity, non-judgement	1-5	1	83 (70% F), 40.6	In person survey (1), Online (1)

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*Behavioural tasks*

Breath Counting Task (BCT) (2014)	Behavioural Task	N/A	Attention, Awareness	Mind wandering, meta-awareness	0-6	6	830 (63% F), 17-67	Laboratory task (5), online (1)
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Mindful Breath Attention Scores (MBAS) (2011)	Self-report & Behavioural Task	5 or 10 <sup>4</sup>	Attention	N/A	N/A	3	1383 (67% F), 16-23	Online (1), In person task (3)
Metronome Task (2022)	Behavioural Task	N/A	Awareness	N/A	N/A	1	22 (55% F), 26-67	Laboratory task (1)
Mindful Awareness Task (MAT) (2023)	Behavioural Task & Self-report	N/A	Awareness, Attention	N/A	N/A	1	143 (77% F), 19-51	Laboratory task and online (1)

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*Physiological observations*

Body movement analysis (2021)	Physiological observation	N/A	Respiration and movement	N/A	N/A	1	17 (NR), NR	Online (1)
Mindful Watch (2017)	Physiological observation	N/A	Respiration	N/A	N/A	1	11 (55% F), NR	Laboratory task (1)

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*Note: Frequency of use refers to number of published journal articles that have used this measure. Sample size refers to the total sample size across studies; gender refers to the gender proportion across the total sample size across studies. Where one number is provided for age range, this indicates the study reported an average age rather than range. A laboratory task refers to any task completed in a laboratory setting, an in-person survey or task refers to those completed in the researcher's presence in a non-laboratory setting, e.g., a university classroom, workplace or MBSR classroom; online refers to measures completed without the researcher's presence, in an online setting, e.g., MTurk. Setting includes number of studies which report setting (note: this can be more than the frequency of use where papers include more than one study, or less if papers do not report setting). NR = not reported. P = participant. \*The MEDI is a shorter form of the MEDEQ.*

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<sup>4</sup> self-reports depending on practice length

Name of measure	1. Content validity	2. Internal consistency	3. Criterion validity	4. Construct validity	5. Reproducibility 5.1 Agreement	5.2 Reliability	6. Responsiveness	7. Floor and ceiling effects	8. Interpretability
<i>Self-report questionnaires</i>									
Toronto Mindfulness Scale (TMS) (2006)	0	+	-	+	0	0	?	0	?
State Mindfulness Scale (SMS) (2013)	+	+/-	?	+	+	0	0	0	?
Mindful Attention Awareness Scale State version MAAS-S (2003)	+	+	?	+	+	0	0	0	?
Meditation experiences questionnaire (MEQ) (2011)	+	0	?	+	0	0	0	0	?
Practice Quality - Mindfulness (PQ-M) (2013)	+	?	0	+	0	0	0	0	?
Meditation Depth Questionnaire (MEDEQ) (2001)	0	0	0	0	0	0	0	0	0
Mindfulness Adherence Questionnaire (MAQ) (2021)	0	+/-	-	+	0	+/-	0	+	?
Meditation Depth Index (2019)	0	0	0	0	0	0	0	0	0
Meditative State Scale (2022)	+	+	-	+	0	0	0	0	?
Neurophenomenological experiment	0	0	0	+	0	0	0	0	?
MIMOSA self-report data (no name given) (2019)									

Self-reported meditation quality (no name for scale) (2021)	0	0	0	0	0	0	0	0	0	0
Time Flow Mindfulness Questionnaire (2022)	0	?	-	+	0	0	0	0	0	0
Two items for each facet of FFMQ (2015)	+	+	+	+	0	-	0	0	0	?
<i>Behavioural tasks</i>										
Breath Counting Task (BCT) (2014)	0, +	0	-	+	?/0	+/-	0	0	0	?
Mindful Breath Attention Scores (MBAS) (2011)	+	0	-	+	0	0	0	0	+/-	?
Metronome Task (2022)	0	0	0	0	0	0	0	0	0	0
Mindful Awareness Task (MAT) (2023)	?	0	-	+	0	0	0	0	0	?
<i>Physiological observations</i>										
Body movement analysis (2021)	0	0	0	?	0	0	0	0	0	0
Mindful Watch (2017)	+	0	?	?	0	0	0	0	0	?

**Table 4**

*Psychometric properties of included measures.*

## Discussion

This study aimed to systematically review standardised measures of practice quality, to understand their psychometric properties, and how each measure has been used in the literature. The search strategy elicited 8150 studies, of which 70 met full inclusion criteria. Within this, nineteen measures of practice quality were found and reviewed, including thirteen self-report questionnaires, four behavioural tasks, and two physiological observations. For self-report formats, mindfulness practice quality has been measured in relation to meditation practice generally, or as a state mindfulness measure following a practice. Self-report questionnaires tended to conceptualise practice quality as being related to curiosity, decentering, attention, awareness, acceptance/non-judgement, transcendence or as containing particular phenomenological experiences. The most frequently used self-report questionnaire was the Toronto Mindfulness Scale (Lau et al., 2006), followed by the State Mindfulness Scale (Tanay & Bernstein, 2013), and the Mindful Attention Awareness Scale – state version (Brown & Ryan, 2003), indicating that the most common approach in research is currently to use a state mindfulness measure following a practice, rather than asking people to self-report quality of practice more generally. Behavioural tasks that conceptualise mindfulness practice quality as relating to attention and awareness, have been less frequently used, and the most common measure of these is the Breath Counting Task (Levin et al., 2014). Lastly, physiological measures of practice quality constitute new developments in this area, and use idiosyncratic conceptualisations in operationalising mindfulness practice quality using respiration and movement; neither measure currently features in the published literature beyond its initial development paper.

Strengths of this work include the systematic use of the Terwee psychometric criteria (Terwee et al., 2007) and QuADS quality criteria (Harrison et al., 2021), and the independent review of studies by up to three researchers. Limitations include that only English language articles were included. Also, the Terwee and QuADS criteria will due to the diversity of measures be less relevant to some than others. For example, the Terwee criteria for content validity requires target population, investigator or expert involvement in item selection, however behavioural or physiological measure may not have items, e.g., the Mindful Awareness Task involves verbally stating experiences and pressing a button for observed inhalation/exhalation. As such, it only meets partial criteria for content validity, which may reflect limitations of the criteria as much as the measure itself. Criterion validity is also difficult to establish for the reviewed measures, as there is no established gold standard measure of mindfulness practice quality. Similarly, while the QuADS is designed for evaluation of diverse study designs, the physiological observation studies were difficult to rate on criteria such as appropriateness of data collection tool, or appropriateness of analytic method, as their technology-focused reports were out of the area of expertise of the research team. To the extent the psychometric and quality criteria are more suited to self-report measures than other kinds, self-report measures may outperform behavioural and physiological measures on some of these metrics, without the latter two necessarily being poorer choices.

A further limitation is that not all measures in this review may be equally relevant as measures of mindfulness practice quality. For measure selection, this review excluded scales explicitly designed for other forms of meditation practice (e.g., the lovingkindness-compassion scale, (Cho et al., 2018), however included measures designed for mindfulness only, and included scales designed to measure meditation practice quality more generally. Measures of meditation practice quality in general may or

may not measure aspects of practice quality specific to mindfulness. For example, the Meditation Depth Questionnaire (Piron, 2001) conceptualises practice quality as including transcendence and creating an empty/blank mind – whilst these are experiences which may occur during mindfulness practice, they are neither desired ‘outcomes’ or targets to aim for, nor are they related to aspects which would indicate quality of mindfulness practice. As such, while these scales were included to promote inclusivity of conceptualisation and represent the diversity of understandings of practice quality, this carries the limitation that not all scales in this review will be equally relevant measures of mindfulness practice quality. As such, when choosing a scale from this review, clinicians or researchers should take careful note of the conceptualisation of the scale, to understand whether this aligns with their own conceptualisation and aims.

## Future Directions

A key barrier to developing standardised measures of mindfulness practice quality is a lack of consensus about how practice quality, or even mindfulness should be conceptualised (Strohmaier & Goldberg, 2024). Practice quality was generally conceptualised in the studies of this review in terms of curiosity, decentering, attention, awareness, acceptance, transcendence, and the experience of particular phenomena during meditation practices. These varying conceptualisations may also reflect the lack of a consensus definition for mindfulness itself (Van Dam et al., 2018). Definitions of mindfulness vary, though many include both attention and acceptance, in keeping with the Monitor and Acceptance Theory (Lindsay & Creswell, 2017), the idea that both are necessary for mindfulness. While Kabat-Zinn’s definitions of mindfulness (which tend to contain attention and non-judgement) are popular (Kabat-Zinn, 2003, 2013), Western psychology researchers have been criticised for designing mindfulness measures on the basis of surface interpretations of incomplete Buddhist definitions, without use of expert or stakeholder involvement, thereby risking denaturing the concept of mindfulness by over-simplifying it into items easily rated on a Likert scale (Chiesa, 2013; Grossman, 2011). For example, Grossman (2011) suggests items of the Mindfulness Attention and Awareness Scale (Brown & Ryan, 2003) measure “self-attributions of inattentiveness during everyday modes of awareness”, rather than the complexity of mindfulness. Without a consensus definition, trait mindfulness measures offer varying conceptualisations, posing a risk to content validity (Park et al., 2013), and the content validity of mindfulness practice quality measures may be questioned in turn. Furthermore, existing psychometric property assessments may not highlight this difficulty. For example, most measures in this review scored positively for content validity using the Terwee criteria; however, it is possible to score positively where the target population and investigators are involved in item selection, and where concepts are clearly described; as such, content validity criteria can be met for researchers (who are not experts) include novice meditators in item development, and where concepts are clearly described, however not necessarily grounded in the mindfulness literature. Therefore, it is important to understand the origins and context of development of a measure before selecting it for future work.

For researchers running clinical trials, or clinicians evaluating mindfulness groups, this systematic review can help to guide selection of measures of practice quality. Importantly, alongside frequency of prior use, practicalities of measures (e.g., whether a measure is too long, or has too many technical requirements for the context) and other psychometrics, this choice can be guided by whether the conceptualisation of practice quality fits with the intervention. For example, an intervention focused on attention training may find the mindful breath attention scores a conceptual fit, while training that

emphasises curiosity to one's experience and decentering may be better evaluated using the Toronto Mindfulness Scale (Lau et al., 2006). If interventions are designed with reference to the Monitor and Acceptance theory (Lindsay & Creswell, 2017), a behavioural measure of attention may be complemented with a self-report measure that additionally captures acceptance (Baer, 2019). Supplementing a behavioural measure with a self-report measure may also improve robustness of findings, as well as provide insight as to which area gains may have been made. As well as a conceptual fit between training and measure of practice quality, it is important to attend the origins of the measure, and its content validity – choosing a measure with a sound theory and conceptualisation will help to avoid problems observed in the practice quantity literature, by enabling cross-comparison.

With regards to future research, researchers should aim towards establishing a consensus definition of mindfulness, and mindfulness practice quality. This could be achieved with a Delphi study, involving recruitment of stakeholders, development of a list of candidate components of mindfulness and illustrative items to disseminate among them, and continuing rounds of questionnaires on non-consensus issues until acceptable agreement is reached (Okoli & Pawlowski, 2004). Some of the key issues in designing this study will include how to decide who to include as a stakeholder (as different groups may reach very different conclusions on the meaning of mindfulness, or practice quality – for example whether mindfulness includes an ethical component or not). Equally important is how to involve people with personal experience (PPE) – service users or people with personal experience should be involved throughout the study, including in planning the design or preliminary work. Furthermore, with regards to gathering items for the long list of core components of mindfulness, where these items are sourced (e.g., questionnaires, academic journals, Buddhist texts), and who is best placed to gather them should be considered. It will also be important to check the accessibility of any resulting definitions, perhaps using think aloud interviews with NHS service users and others likely to engage in mindfulness. Furthermore, anonymity of the stakeholders should be considered throughout the rounds, to reduce dominance by well-known members (Nasa et al., 2021).

Secondly, future practice quality questionnaire development will benefit from working with experts in mindfulness, and testing items across diverse samples (in terms of demographics and mindfulness experience) to ensure measures have content validity across contexts and populations. It may be helpful to have the same sample complete multiple measures, to assess their correlation and common factors. In addition, developing an understanding of a minimal important change could help in evaluating mindfulness interventions. Furthermore, as recommended for trait mindfulness measures (Grossman, 2011; Park et al., 2013), further work on self-report measures should disentangle practice quality from familiarity with mindfulness language, social desirability and valuing mindfulness. Establishing content validity, interpretability and responsiveness will contribute to the usefulness of mindfulness practice quality measures in both evaluating mindfulness interventions, and understanding the basic science of how practice quality relates to mindfulness and related constructs. Specifically, future research could further evaluate whether practice quality mediates the relationship between practice quantity and mindfulness. If this is established, mindfulness practice quality may be an important outcome in mindfulness intervention dismantling trials, which could investigate which active components of mindfulness interventions affect practice quality, as well as outcomes such as stress and wellbeing, mental health outcomes and trait mindfulness. If content validity is established, using these measures could elucidate the role of mindfulness practice quality within intervention inputs and outcomes, and could also have implications for whether practice quality or quantity is more greatly emphasised in mindfulness interventions.

More broadly, measures of practice quality could be used to answer questions about the conditions that increase or decrease quality of practice (for example, whether quality is affected by mood, or fatigue). They could be used to explore in more detail the relationship between quantity and quality of practice, and to what extent quality of practice relates to motivation towards subsequent practice. Exploring quality of practice in novice and expert meditators, or in cohorts progressing through meditation teaching could provide insight into how the relationship between quantity and quality of practice changes as meditators gain in experience.

In conclusion, there are many ways of measuring practice quality, including via self-report, behavioural tasks and physiological observations. Each measure conceptualises practice quality somewhat differently, using varying concepts (including curiosity, decentering, attention, awareness, acceptance, transcendence, and the experience of particular phenomena during meditation practices), and using unidimensional or multidimensional operationalisations. Psychometric properties across measures were variable, with measures tending to perform well in terms of construct validity, but fairly poorly in other domains, especially with regards to interpretability and responsiveness, as information on usage or score interpretation is scarce. Similarly, studies investigating quality of practice tended to demonstrate good quality in terms of theoretical underpinning, clear research statements and appropriateness of study design, data collection tool and method of analysis, however poorer performance in terms of justification of analytic method, and consideration of stakeholders in research design and conduct. The most commonly used measure is the Toronto Mindfulness Scale (Lau et al., 2006), however, this review does not recommend any particular scale above the rest for measuring practice quality. Future work should aim towards reaching a consensus definition of practice quality, towards involvement of stakeholders and mindfulness experts, as well as validating measures for samples with different demographics. In the meantime, when making a choice of how to measure practice quality, researchers and clinicians should consider the frequency of use of a measure (for cross-comparability with other research), the conceptualisation of practice quality and how this fits with their own intervention's or theoretical conceptualisation, and the psychometric properties – where possible, use of a self-report and behavioural measure may promote robustness of measurement.

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# SERVICE-RELATED PROJECT

*Senior staff perceptions of trauma-informed care in an NHS mental health trust*

**Marike Fordonnell**

[msod20@bath.ac.uk](mailto:msod20@bath.ac.uk)

**Internal supervisor:** Prof. Paul Chadwick

**External supervisor:** Dr Emma Hartley, Dr Emma Griffith, Dr Chris Gillmore

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## Introduction

Trauma, defined as exposure to an extremely horrific event or series of events (World Health Organisation, 2019), strongly predicts poor mental and physical health outcomes, including anxiety, depression, cancers, cardiovascular disease, Type II diabetes and respiratory disease (Bellis et al., 2019; Hu et al., 2021; Hughes et al., 2017). Research indicates that mental health service users experience high rates of trauma, and higher rates compared to general population samples (Kessler et al., 2010; Mauritz et al., 2013), with one study finding 31.8% of UK mental health service users had childhood abuse noted in their health records (Mantovani & Smith, 2021). Whilst estimates of post-traumatic stress disorder (PTSD) prevalence range from 3-5% in the UK (NICE, 2020), evidence suggests that both trauma and PTSD may be clinically under-detected. For example, comparing clinician assessments with health records, U.S. studies have found that 87% of service users with severe mental illness had experienced trauma, but only 28% had trauma documented in their health records, and that prevalence of PTSD ranged from 29-43%, with only 5% having PTSD noted in health records (Cusack et al., 2006; Mueser et al., 2002). More recently, a systematic review has suggested the median rate of clinically undetected PTSD in secondary care across the U.S., the UK, Australia, the Netherlands, South Africa, Germany, Spain and Turkey is 29%, ranging from 18-39% (Zammit et al., 2018).

Trauma is also commonly experienced by NHS staff, with surveys indicating 22-39% of UK health and social care workers meet PTSD criteria (Greene et al., 2021; Wild et al., 2022). Though self-selection effects, and the difficulties of recruiting a representative sample of a stretched healthcare workforce should be considered (e.g., 47% of Wild et al.'s sample were ambulance workers), the findings nevertheless suggest trauma and PTSD are common among health service staff and users. As such, to avoid creating situations in health services in which these individuals intensely re-experience their trauma symptoms (re-traumatisation), mental health services should operate with trauma-informed practice (Hooper & Warwick, 2006).

While many mental health services are developing in trauma-informed care, areas for improvement remain. Read et al. (2018)'s review indicated that only 0-22% of adult mental health service users were asked about childhood abuse in adult services. Moreover, in Scholes et al. (2021)'s interviews, UK women with previous mental health inpatient experience raised concerns about some inpatient experiences being re-traumatising, including feeling coerced into treatment (medical or otherwise), not feeling able to speak about their trauma, and use of physical restraint (especially where large male staff practiced restraint in physical positions that were triggering for sexual abuse memories). Furthermore, users of inpatient services have discussed that aspects of care such as 24-hour observations, restraint, forced medication, body searches and little choice over activity can leave people feeling out of control, powerless and retraumatised, as well as the vicarious traumatisation potentially experienced by staff in these situations (Fish & Hatton, 2017; Sweeney & Taggart, 2018).

Increasingly, mental health services are aiming towards becoming trauma-informed. Previous barriers to this goal have included mental health practitioners receiving limited education or guidance on trauma-informed practice (Cutcliffe et al., 2018; Holmes et al., 2004; Larue et al., 2013; O'Dwyer et al., 2019; Scholes et al., 2021), with service users and staff reporting that limited awareness of or education on trauma, alongside systemic pressures such as understaffing, constitute major obstacles



to providing trauma-informed care (Brophy et al., 2016; Sweeney et al., 2018). To reduce risk of re-traumatisation, services are increasingly looking to practice trauma-informed care (TIC), by using trauma-informed approaches (TIA). Trauma Informed Approaches (TIA) are defined as a system development model “grounded in and directed by a complete understanding of how trauma exposure affects service users’ neurological, biological, psychological and social development” (Paterson, 2014, p.7). Arthur et al. (2013) outline that principles of a TIA include building awareness of trauma amongst service staff, taking measures to promote safety and trustworthiness (e.g., creating welcoming intake procedures and physical spaces, and demonstrating predictable expectations), providing opportunities for service users to have choice and collaboration in their care, and promoting strength and skill building to help service users develop their resilience and coping skills. As such, TIAs aim towards providing safety and trust, whilst preventing re-traumatisation.

The emerging literature suggests TIAs may benefit services and service users. Azeem et al. (2011) found that use of seclusion and restraint in an adolescent inpatient mental health unit halved, after implementing several TIC strategies, such as leadership focus on TIC, workforce training, and restraint and seclusion reduction tools. Similarly, Hales et al. (2019) found a multi-year TIC program in a rehabilitation centre, which included TIC champions, TIC psychoeducation groups, reflective conversations and coaching, led to improved service user and staff satisfaction, reduced unplanned discharges, and improved TIC organisational practices, assessed by the trauma-informed organisational self-assessment (Guarino et al., 2009). Importantly, both TIC programs involved significant investment of time and resources; by contrast, much of the TIC literature evaluates the effects of one-off training programs (Isobel & Delgado, 2018). For example, Niimura et al. (2019) found that a one-day TIC workshop resulted in improved attitudes towards TIC in mental health professionals, whilst Hall et al. (2016) found that following eight 45-minute modules on TIC, emergency department nurses demonstrated greater awareness of the impact of trauma on mental health. However, the nurses reported that implementing TIC principles within their day-to-day work was highly challenging due to time constraints, barriers additionally found by Bartlett et al. (2016)’s evaluation of a TIC initiative. As such, to avoid TIC becoming a buzzword, or the subject of a one-off training hour, organisational change is necessary to support staff to embed TIC into service practices.

In response to the global COVID-19 pandemic, the present mental health trust has developed guidance on TIC, and compassionate leadership (Name of Trust, 2022). The purpose of this guidance was to better support staff through the pandemic, a period that was identified as likely to be traumatic for staff. The guidance identified that during the first months of the pandemic, many health and social care staff were identified as experiencing depression, anxiety and post-traumatic stress. It also spoke to that staff could experience vicarious traumatisation through supporting traumatised patients, traumatic stress from believing their life is at risk from working with COVID-19 patients, and moral injury in not being able to practice in line with one’s values in the face of patient demand outstripping resources. As such, trauma-informed care and compassionate leadership were identified as important directions for the Trust, which has outlined it is aiming to adopt the trauma informed principles of safety, choice, collaboration, trustworthiness, empowerment and cultural humility.

The present mental health Trust has taken several steps towards becoming trauma-informed. The Trust has introduced TIC leadership roles within senior leadership, to promote developments towards TIC. A TIC leader, alongside other Trust staff with an interest in TIC, is aiming to deliver a multi-year intervention to understand and develop TIC within the Trust, to help the Trust move towards becoming

trauma-informed. To understand what kinds of TIC training or development may be helpful, it is important to first understand what TIC needs exist within the organisation; including where services are functioning well with regards to TIC, and where further improvements could be made. Therefore, the present survey was administered to service team managers within the Trust, to self-rate their services on areas of TIC. The aim of this study is to gain an understanding of the Trust's current performance on the key areas of trauma-informed care, so as to inform planning on areas for improvement.

## Method

### Participants

Participants were Team Managers or staff with an equivalent knowledge of the team's workings (e.g., Senior Practitioners) – participants were recruited at this level so that responses could be based on a thorough knowledge of team practices across areas of TIC. Inclusion criteria included that participants should be a team manager, or someone with a similar detailed understanding of team practices – no other inclusion or exclusion criteria were used so as not to limit recruitment.

### Recruitment

Recruitment strategies included sending recruitment emails (with information sheet attached; see Appendix A and C) to business administrators to disseminate to Team Managers and Senior Practitioners, sending recruitment emails to local groups within the Trust, advertising the survey in the Trust's comms bulletin, and the research team promoting within their local networks. Completion of the survey was voluntary (not reimbursed). The survey was left open for six months to maximise recruitment opportunity (as recruitment was slow), though it is important to note staff teams may have experienced changes in TIC within this period. To encourage a high response rate, survey recruitment emails and the information sheet emphasized that the aim was to measure a baseline and identify future training and development needs – rather than to audit against an expected standard of care. Data collection took place between July and November 2022.

### Design and procedure

The project used a mixed methods approach, including mainly quantitative data, supplemented by two qualitative questions. The project was aimed at providing descriptive data, with comparisons between regions or organization area (e.g., inpatient vs. community) if numbers were sufficient. Therefore, comparisons were not specifically planned, but dependent on response rate. Participants read the information sheet (Appendix A), before completing the consent form (Appendix B). Region and organization area information was then collected, so that results could inform future training opportunities, however names of individual teams or respondents were not collected to preserve anonymity where possible.

After completing the consent form, region and area of the organization information (the survey did not collect names or positions, so was anonymous at an individual level), participants then proceeded to complete the Trauma-Informed Organisational Self-Assessment (Guarino et al., 2009), hosted online on the Trust Intranet platform. The Trauma-Informed Organisational Self-Assessment (TIOSA) is a 135-item questionnaire, and the main areas the questionnaire covers, including example questions, are summarized in Table 1 below. Following a small pilot among the research team staff, and another member of staff connected with the research team in the organization, the questionnaire was expected to take fifteen minutes. For the full questionnaire, see Appendix D. Following the TIOSA, participants completed two free-text qualitative questions: 'Has your team been actively working towards becoming trauma-informed? If so, how?' and 'Do you have any other comments you would like to add about working with trauma in relation to your service?'

**Table 1***Categories and subcategories of the TIOSA and example questions*

Trauma-Informed Organisational Self-Assessment category	Sub-category	Question example
1. Supporting staff development	A. Training and education	Staff at all levels of the team receive training and education on what traumatic stress is.
	B. Staff supervision, support and self-care	Staff members have a regularly scheduled time for individual supervision.
2. Creating a safe and supportive environment	A. Establishing a safe physical environment	Staff members ask service users for their definitions of physical safety
	B. Establishing a supportive environment	Team information is available in different languages.
3. Assessing and planning services	A. Conducting intake assessments	The intake assessment includes questions about social supports in the family and the community.
	B. Developing goals and plans	Service user goals are reviewed and updated regularly.
	C. Offering services and trauma-specific interventions	The team has access to a clinician with expertise in trauma and trauma-related interventions.
4. Involving service users	A. Involving current service users	Current service users are involved in the development of Team activities
	B. Former service users	Former service users are involved in Team development.
5. Adapting policies	A. Creating written policies	Written policies are established based on an understanding of the impact of trauma on service users
	B. Reviewing policies	The Trust involves service users in its review of policies

***Qualitative data***

Qualitative data was elicited from two questions: ‘has your team been actively working towards becoming trauma informed? If so, how?’ and ‘Do you have any other comments you would like to add about working with trauma in relation to your service?’, with responses given in a free-text box. Results were analysed using content analysis, which was selected due to the (predicted) limited quantity and length of responses, and to gain an understanding of the proportion of respondents that had been

actively working towards becoming trauma informed, or had additional comments on TIC. Themes were identified from the qualitative data, and responses were categorized accordingly.

### *Ethics*

Ethical approval for this Service evaluation was granted by the Quality Improvement Team at the NHS Trust. All participants received an information sheet including study aims, purpose, how results will be used, and result dissemination. The information sheet also included information about approximate completion time; that the study requests no personally identifying information and thus data responses cannot be withdrawn once submitted; that individual teams will not be identified in reports of the results; instructions and explanations of terms used in the questionnaire; and contact details for the lead researcher for further questions. Participants were informed that no personally identifying data would be collected, however information about area of organization and region would be, that the results would be used to inform future service development, and that any publication of data (i.e., report for the Quality Improvement Team, the trainee's doctoral thesis or publication in an academic journal) would have anonymized data only. Participants then gave informed consent prior to beginning the questionnaire. To preserve anonymity, the Quality Improvement Team sent a fully anonymized database of the results to the lead researcher, and all results are reported as averages across the Trust as a whole, so individual teams are not named. To promote equality of opportunity, if participants required assistance in filling out the questionnaire, they were given contact details to arrange a phone appointment with the lead researcher/Quality Improvement Team staff member to complete the survey over the phone.

## Results

### Response rate

The final sample size was 23, with all responses received during the six-month period the survey was live. As the survey requested team managers (or members of the team with a similar understanding of the team practices, e.g., senior practitioners) to participate, this indicates that out of a best estimate of 130-150 team managers (suggested by the Quality Improvement Team), our response rate was therefore 15-18%. This response rate was lower than the 22% the Quality Improvement Team observes on average. Whilst this figure is therefore not a high proportion of the available sample, one strength of the data is its diversity of sources. As can be seen from Tables 2 and 3 below, we received at least one response from every sampled area of the organization, and nearly every region. The zero responses for secure or corporate may furthermore be an artefact of the way region responses were set up; as respondents could only select one region, participants may have identified their geographical region, rather than identifying with for example, secure – that we have several responses from regions and zero from secure may be evidence to support this. To avoid confusion or secure or corporate services being mistakenly identified as non-responders, we have removed them from the region table (Table 2, below). What is currently unknown is the extent to which our samples are representative or whether in any case the same team completed more than one survey response (e.g., two members of a team completed a response) – if so, this could skew our findings. The number of responses for each region and area of organization are below a cell count of 25-30, indicating that, according to central limit theorem, our confidence that the available data are representative of each region or area is limited (Zhang et al., 2023). Thus, to avoid providing unhelpful or misleading information (particularly for comparisons), we have only provided response data for the Trust as a whole, rather than by area or region. To avoid identifying individual respondents, demographic data was not collected, however, for region and area of the organization information, see Tables 2 and 3 below.

**Table 2**

*Region of responses*

Area	Number of responses
Region 1 (urban and rural)	2
Region 2 (urban)	1
CAMHS	3
Region 3 (rural)	3
Region 4 (rural)	1
Specialised (including Prison)	7
Region 5 (urban)	2
Region 6 (rural)	3
Major region 1 (including regions 1, 5 and 6)	7
Major region 2 (including regions 2, 3 and 4)	5
Other (CAMHS, specialised, corporate/management)	11

**Table 3***Area of organisation of response*

Area of Organisation	Number of responses
Community	11
Inpatient	3
Prison	4
CAMHS	3
Other	2

*NB. Community, inpatient and prison services refer to adult mental health services. CAMHS consisted of two inpatient and one community CAMHS – for the purposes of this survey, these are grouped together under CAMHS, with adult mental health services divided into community, inpatient and prison.*

### TIC results at the service level

Questions in the first four categories of questions (supporting staff development, creating a safe and supportive environment, assessing and planning service and involving service users) were assessed/answered at the service level (i.e., how is the team manager’s own service doing in relation to these areas?). Global, category and sub-category averages of trauma-informed care for the Trust are presented in Table 4 below, with data presented including means, standard deviations and number of questions. As can be seen from these data, responses to areas of trauma-informed practice are broadly positive, with the global average just below 3 (where 1=strongly disagree, 2=disagree, 3=agree, 4= strongly agree), indicating that the mean response of the 23 team managers or equivalents sampled is agreement that the Trust is currently providing trauma informed care. The responses by category and subcategory all appear fairly consistent, differing at most from the mean by .93. This suggests that on the basis of the current data, the Trust staff sampled by and large agree that their services provide trauma-informed care across most key areas.

Whilst responses are mostly consistent and broadly positive, based on this baseline data from 23 participants, areas that services may choose to prioritise in their ongoing development of TIC include involving former service users (M=2.48), and training and education (M=2.61), as these had the lowest scores across the TIC sub-categories.

**Table 4**

*Survey findings by global average, category and subcategory of trauma-informed care for the Trust, including number of items, means and standard deviations (in brackets).*

	Number of items	Trust scores
<b>Global Average TIC</b>	<b>135</b>	<b>2.95 (.33)</b>
<b>1. Supporting Staff Development</b>	<b>29</b>	<b>2.78 (.53)</b>
1A. Training and education	17	2.61 (.67)
1B. Staff supervision, support and self-care	12	3.01 (.51)
<b>2. Creating a safe and supportive environment</b>	<b>51</b>	<b>3.02 (.33)</b>
2A. Establishing a safe physical environment	11	2.93 (.41)

2B. Establishing a supportive environment	40	3.07 (.35)
2Bi. Information sharing	6	2.68 (.43)
2Bii. Cultural competence	6	2.78 (.51)
2Biii. Privacy and confidentiality	10	3.41 (.41)
2Biv. Safety and crisis planning	9	3.07 (.57)
2Bv. Open and respectful communication	4	3.09 (.49)
2Bvi. Consistency and predictability	5	2.99 (.43)
<b>3. Assessing and planning services</b>	<b>36</b>	<b>3.09 (.33)</b>
3A. Conducting intake assessments	22	3.12 (.34)
3B. Developing goals and plans	6	3.13 (.46)
3C. Offering services and trauma-specific interventions	8	3.06 (.36)
<b>4. Involving service users</b>	<b>9</b>	<b>2.61 (.58)</b>
4A. Involving current service users	4	2.71 (.68)
4B. Involving former service users	5	2.48 (.71)
<b>5. Adapting policies</b>	<b>10</b>	<b>3.08 (.30)</b>
5A. Creating written policies	7	3.13 (.68)
5B. Reviewing policies	3	2.48 (.72)

NB. Scale is from 1-4 where 1= strongly disagree, 2= disagree, 3=agree, 4=strongly agree. Standard deviation is in brackets.

### TIC results at the Trust level

Questions in the fifth category (adapting policies) were answered at the Trust level, as each service was unlikely to have its own policies for the individual areas. The responses for this fifth category remain positive overall, however one area the Trust may wish to prioritise in ongoing work towards TIC according to the present baseline data is reviewing policies ( $M=2.48$ ), as this scored lower than creating policies ( $M=3.13$ ), and towards the low end of sub-category scores more generally. Thus, while scores were positive overall across the subcategories of the survey, the three lowest scores (involving former service users, reviewing and updating policies and training and education) are highlighted as areas in which the Trust may like to consider in ongoing efforts towards promoting trauma-informed care.

### Qualitative data

Twenty-one responses were received for the question ‘has your team been actively working towards becoming trauma informed? If so, how?’ with response lengths ranging from 1-60 words, with twenty-one responses received for the question ‘do you have any other comment you would like to add about working with trauma in relation to your service?’, with response lengths ranging from 1-88 words.

In response to ‘has your team been actively working towards becoming trauma informed? If so, how?’, 11/23 responded yes and provided a clear example, 3/23 responded yes and gave no clear example, 1/23 responded unsure, 6/23 responded no, and 2/23 did not respond. Examples of activities teams had taken towards becoming trauma informed included:

- Training staff in trauma-informed care, attachment, or safeguarding (9/11)
- Staff offering trauma-focused therapies e.g., trauma-focused CBT or EMDR (3/11)
- Using trauma informed practices e.g., creating a safe base (2/11)



- Having a trauma-informed care champion (1/11)

In response to 'Do you have any other comment you would like to add about working with trauma in relation to your service?', 2/23 commented that TIC was important and referenced a clear plan to develop TIC in their service, 3/23 commented that TIC was important for their service (however did not mention a future plan to continue developing this), 3/23 requested TIC training for their service, 3/23 described the limitations within the service context to their ability to provide TIC, 3/23 described limitations of the survey, 5/23 responded with 'no' or 'not applicable', and 3/23 did not provide responses. Limitations in the service context included overly noisy, bright and insufficiently confidential rooms that are 'impossible to book', responding to high levels of crisis and risk leaving insufficient time for TIC tasks, and the potential challenges of providing TIC in the prison context. Limitations of the survey included being too long, and questions that were irrelevant to the individual service, for example questions about clinical spaces/clinical environment where services had no control over this, and questions about children being less relevant to some services. Future plans to develop TIC included involving peers/service users in service planning and team manager TIC projects.

## Discussion

The aim of this project was to establish a baseline self-assessment from Team Managers and senior practitioners of an NHS Mental Health Trust's current performance across key areas of trauma-informed care, to inform future training and development opportunities. Twenty-three responses were received, which given an estimate of 130-150 team managers, gives a response rate of approximately 15-18%. The results of this study have been analysed in terms of response rate, mean ratings of TIC across the trust at the global average, category and sub-category level, and qualitative feedback on TIC within the Trust.

Our findings indicate that the team managers sampled on average agree (rather than strongly disagree, disagree or strongly agree) that the Trust currently provides trauma-informed care. Across categories (supporting staff development, creating a safe and supportive physical environment, assessing and planning services, involving service users and adapting policies) and subcategories, results are consistently positive. Findings indicated less than half a point's difference between the highest (assessing and planning services) and lowest (involving service users) rated category, and a difference of .93 between the highest (privacy and confidentiality) and lowest (involving former service users and reviewing policies) rated subcategories. Within this, no category or subcategory of TIC was rated lower than 2.48. These results suggest that, out of the twenty-three team managers or equivalents who completed our baseline survey, these respondents on average agree that the Trust currently provides trauma-informed care across categories and subcategories of TIC.

Thus, the overall results are positive, however, a key aim of establishing a baseline is to identify areas for future development. The number of responses gained does not allow us to perform statistical analyses to establish significant differences between category or sub-category ratings. However, from the available 23 responses, areas for future development could include involving former service users, reviewing policies and providing training and education on TIC, which collectively gained the lowest ratings across the subcategories of trauma informed care at 2.48, 2.48 and 2.61 respectively. Appendix D has a list of responses by question item, which may offer specific focuses for TIC training and development.

Involving former service users may have a lower rating because expert-by-experience initiatives, though growing, are relatively new in the history of mental health trusts (in comparison, for example, to conducting intake assessments), thus answers may reflect this is an area with room for further development (Noorani, 2013). For example, this sub-category asks questions about whether former service users are hired 'at all levels of the program' and 'involved in providing services (e.g., peer-run support groups, educational and therapeutic groups)'; answers may reflect that former service users may be hired on a consultancy/advisory basis, but may have less presence in permanent positions such as support or education, or service leadership roles. Equally, research suggests individuals are less likely to disclose mental health in work compared to social circles, with fear of stigma discouraging disclosure (Zamir et al., 2022). Fear of stigma may mean that mental health service staff may not wish to widely disclose former service use, thus limiting understanding of the extent to which former service users are employed at all service levels.

Reviewing policies was answered at a Trust-level, and approximately half the sample answered these questions with 'don't know'. Notably, while 'creating policies' was one of the highest rated sub-

categories at 3.13, 'reviewing policies' was one of the lowest, at 2.48. Whilst we cannot know if such a difference is statistically significant, this may reflect that staff are more likely to be aware of the existence of policies than the current procedures for reviewing them. It may also reflect that the TIC movement, like the expert-by-experience movement, is relatively new in the history of UK mental health services (Sweeney et al., 2016), thus more explicitly TIC-related policies may be at the creation stage more than the review stage. This could suggest that reviewing policies could be an area for future development, either in terms of procedure or of communication about procedure to increase service awareness.

Finally, lower ratings for training and education, as well as qualitative feedback requesting this, suggest a desire for further TIC training. That training and education has lower ratings may additionally reflect the question wording 'staff at all levels of the team receive training and education on the following topics' – depending on the interpretation of 'all levels of the team', responses may differ; for example, one respondent in the qualitative feedback noted that they answered this section in relation to the knowledge of staff with least training and qualifications, however it is unknown whether other respondents may have taken a similar approach or not, which may have influenced scores on this subcategory. Hence, overall, ratings of TIC across categories and subcategories were broadly positive, clustering around 'agree'. Three areas which scored lowest, and which may be considered for future development opportunities are training and education, involving former service users and reviewing policies.

The findings of the qualitative data are largely consistent with the quantitative data. Responses indicated that just over half (14) of the 23 team managers or equivalent responded that their teams had been actively working towards becoming trauma-informed, with 11 of these providing a clear example of how. That a majority of the services sampled reported they had been actively working towards becoming trauma informed is encouraging, as is the variety of examples (including training on trauma and attachment, trauma-specific therapies, and offering predictable environments) given of TIC practice pursued by services. These results, coupled with the mean of 'agree' to TIC questions, may reflect that TIC has been a priority of the Trust in recent years (Name of Trust, 2022), with new staff roles created for Trauma Lead and for TIC champion within services, and a number of projects within the trust providing research into TIC. Such progress is therefore encouraging.

However, change towards TIC practices take considerable time and organisational effort (Sweeney et al., 2016). 6/23 team managers/equivalents responded 'no' and 1/23 responded 'unsure' as to whether their service had been actively moving towards becoming trauma informed (with 2/23 providing no response). That 7/23 are not currently moving towards becoming trauma-informed, or are unsure if they are, may reflect several considerations. Firstly, the literature suggests many health service staff are familiar with the concept of TIC, however uncertain of what this means in practice, how it may differ to current practice, and therefore whether they are 'there already' or require change (Brophy et al., 2016; Sweeney et al., 2018). Thus, lack of awareness of what constitutes TIC in either theory or practice may be a reason for not actively pursuing it, an interpretation supported by two respondents whose team had not been actively pursuing TIC, and requested training on this. Secondly, organisational or systemic limitations may pose barriers to TIC (Brophy et al., 2016; Sweeney et al., 2018). For example, service under-staffing, time restraints, or seeing more service users in crisis may present barriers to services having the resource to develop and embed TIC practices. Support for this interpretation comes from a response that highlighted that 'responding to high levels of crisis and risk

also means that some TIC tasks cannot be done with clients due to time pressure'. Organisational limitations to providing TIC may also include the physical environment (one respondent described their service environment as noisy, with poorly fitted doors that mean rooms are not confidential, and with issues in booking rooms, all of which makes 'it hard to be Trauma Informed'). Overall, qualitative data from team managers/equivalents suggested that a majority of services were actively working towards becoming trauma informed; of those who are not currently, some cited a need for training to be able to move towards TIC, others cited organisational limitations including time pressure and high levels of risk and crisis among service users, or an unsupportive physical environment.

## Limitations

Limitations in response rate, recruitment period, and of the survey used are important to bear in mind when interpreting our results.

Firstly, our response rate of 15-18% was somewhat below the average response rate for surveys issued by the Quality Improvement Team, which is 22%. A low response rate may relate to time pressures on NHS staff, especially in the context of staff shortages (Adams et al., 2021). For our survey in particular, our target population limited the pool of staff eligible to participate, and the length of the survey, the limitations of the survey platform (users were unable to save progress mid-survey) may have led to participant attrition. Because only completed surveys could be saved, we are unable to see how many had started, but not finished, we received verbal feedback from at least one team manager that they lost their progress, and lacked the time to restart from the beginning.

The limited response rate and target population may limit the extent to which our results can be generalised to the Trust overall. Specifically, sampling bias may have occurred, whereby survey completers may be more likely to be already interested in and working towards TIC than non-completers. Furthermore, targeting only senior practitioners/team managers has the advantage of providing one response per team (limiting over-representation of any one team) and that respondents at this level are likely to have a broad understanding of team practices. However, one respondent per team will necessarily have imperfect knowledge of trauma-informed practice across the team, limiting our understanding of others' practices and perspectives. Despite a limited response rate, a key strength of the present dataset is its diversity of responses from across the trust, in that representation was obtained from across almost each region and area of the organisation surveyed.

Secondly, the duration of recruitment may be a limitation. Originally, it was planned that recruitment would be open for 1-2 months, depending on response rate. However, as only 10 responses were gained in the first 5 months, it became necessary to keep the survey open for a sixth month, and for the team to use personal contacts across the Trust to promote the survey to other team managers/senior practitioners. Thus, a six-month recruitment window was helpful, and perhaps necessary for obtaining an appropriate sample size. However, disadvantages of the six-month recruitment window (and differences in recruitment style across this time) could be that there may be a difference between those who participated earlier vs. later (e.g., early responders could have been more interested or invested in TIC), and that using personal contacts may have meant team managers/senior practitioners who were known to the project team were more likely to participate than those who were not. In addition, the recruitment period spanning six months may have meant that elements of TIC practice could have changed for teams over the six-month period, providing less

of an accurate snapshot of one point in time, for example, teams may have undertaken training in this period, or changed elements of their practice. Equally, certain times of the year may be busier or more pressured for teams than others (the survey spanned June-November 2022), which could lead to differences in time of year accounting for some variance in scores, leading to further difficulties (in addition to sample size) in cross-comparing areas of organisation or regions.

Thirdly, the survey used does not directly assess trauma-informed care, but senior staff perceptions of it. This introduces greater subjectivity into the results, than if trauma-informed care had been measured, for example, via an audit completed by an outside team. Senior staff ratings of their own teams may be influenced by social desirability, or fear of negative evaluation from the Trust. This could potentially be especially the case at the Team Manager level, as setting a team's organisational culture, working towards TIC by arranging training and implementing TIC practices, may be perceived to be a Team Manager's responsibility towards their own team. Whilst participants were informed that no personal details would be collected, depending on the number of area of organisations per region (e.g., number of CAMHS in Region 1), survey respondents may have felt their team, and therefore possibly their own identity could be recognised from the survey. Given that social desirability may be more likely when participants believe they could be recognised from their data (Lautenschlager & Flaherty, 1990), this could have resulted in potentially higher ratings of TIC than an external audit.

Fourthly, the Trauma Informed Organisational Self-Assessment is not yet well established in terms of its psychometric properties for mental health services, and the limitations of this measure should be noted (Thirkle et al., 2021). Whilst it was developed in consultation with research and trauma experts, service users and community providers, which helped to establish face validity, the Trauma-Informed Organisational Self-Assessment was based on homelessness services specifically, and is not linked to a journal article providing evidence of reliability and validity, a limitation both the developers and a review of instruments for exploring trauma-informed care note (Guarino et al., 2009; Thirkle et al., 2021). This lack of understanding of psychometric properties could for example mean that responses are likely to cluster around agree, though, Lambert et al. (2017) found that most staff responded with 'disagree' on several categories of the TIOSA, providing some evidence against this possibility. One aspect of the survey design which may affect its psychometric properties is the variability in number of question items between subcategories. Notably, two of the lowest scoring categories, involving former service users and reviewing policies, also have some of the fewest question items per subcategory, at only 5 and 3 question items respectively. Thus a low score on one of those question items would be more likely to affect the overall subcategory score on these items, than for example conducting intake assessments, which included 22 items.

A final limitation was the survey's length and that it was not possible to save progress. One respondent fed back in response to the second qualitative question fed back that the survey was 'too long', and similar informal verbal feedback was obtained that this, alongside the inability to save progress discouraged completion. As such it is likely that these survey limitations further restricted our response rate. To avoid these difficulties, a pilot study with the intended participant pool could have been undertaken to assess feasibility and accessibility of the questionnaire, which could have helped to understand whether team managers or equivalents found the length of the questionnaire acceptable. Furthermore, if the results of such a pilot had indicated the questionnaire was too long to be acceptable to staff, work could have been undertaken to decrease its length. Reducing the number

of items could facilitate participant engagement, reduce fatigue and fatigue-related error (Staffini et al., 2022). Reducing the length of the TIOSA could be achieved by using feedback from a pilot study (e.g., if staff consistently fed back some items were irrelevant to their roles) or by the results of the present study (removing items most frequently rated as 'not applicable to my role' from future questionnaire administration). Alternatively, assuming an appropriate sample size, survey reduction could be informed by factor analysis (e.g., principle components analysis (Brosnan et al., 2018)), or by examining internal consistency of subscales (using Cronbach's alpha). However, despite its limitations, the survey has several advantages. Firstly, as it is one of the few TIC surveys which was free, (the majority being accessible only through a significant paywall (Thirkle et al., 2021)) its cost-effectiveness is an advantage given limited NHS resources. Secondly, the survey's length provides ample detail for service planners wishing to establish how to improve TIC (Guarino et al., 2009). To aid such service planning, a table of responses-by-item is provided in Appendix B.

### Considerations for future evaluations

The following considerations and recommendations are made for future evaluations of trauma informed care. With the acknowledgement of the limited response rate obtained in this work, the following recommendations can be made to improve future response rates. Firstly, as the Trust intranet survey platform meant that progress could not be saved (potentially losing responses and discouraging completion), an alternative survey platform that allows survey progress to be saved could be utilised, if this could comply with Trust confidentiality standards. Secondly, recruitment could potentially be boosted in future through hiring a research assistant or assistant psychologist to complete the surveys via phone – however, ethical issues of coercion, or the potential to exacerbate social desirability via the staff's identity being known to the research assistant should be considered. Whilst, due to the overall sample size, in the present study there were not enough responses per area of the organisation or region to provide feedback on how service areas or regions compare on TIC, if a greater number of participants could be recruited to respond to subsequent surveys, this comparison could be facilitated, if it was still of interest. Thirdly, whilst using an alternative, shorter survey would be ill advised if the Trust wishes to compare baseline to post-intervention scores, given the length of the survey may have limited the response rate, the Trust may choose to use an alternative, shorter validated TIC survey for a new baseline and post-intervention measure; however, at present the available alternatives may not prove cost-effective. They may also lack the depth of the TIOSA, rendering them less suitable for informing TIC service development. As such, given this advantage of the TIOSA in a service development context, thorough testing and establishment of its psychometric properties may prove important for its future application (Thirkle et al., 2021).

As Trauma-Informed Care initiatives expand, future measures of perceptions of TIC may choose to include staff of lower bandings and service users in recruitment. Surveying lower banded staff and service users may lead to more incomplete data (as it is perhaps less likely that staff at lower bands or service users will have as broad a knowledge of a team's TIC practices as a Team Manager/Senior Practitioner, therefore there may be more 'don't know' or 'N/A' responses), however, their perspective would likely provide additional insight into TIC. For lower banded staff, similar sources of response bias may apply as to senior staff, in that those who are more interested in TIC or feel they have more time may be more likely to complete a TIC survey, compared to less interested/informed or more over-stretched staff. For service users, there could potentially be a similar bias, in that perhaps only those who feel trauma applies to them personally may be interested in completing the survey,

and of these perhaps those who have had either a very positive or very negative experience with TIC in their team may be most interested in replying. Such a bias could potentially present a somewhat skewed picture of TIC across the Trust, however could add rich context, especially within qualitative data.

## Conclusion

Overall, our findings are as follows. The quantitative data from the 23 responses collected indicate that of this sample, team managers generally agree that the Trust's services provide trauma-informed care, with ratings consistently positive across areas of TIC. Three areas with somewhat lower agreement include involving former service users, reviewing policies and providing training and education on TIC – the Trust may consider these as areas for further development of its existing trauma-informed care. Response rates to the survey were slightly below average for the Trust's Quality Improvement Team projects, with the length of the survey and time pressures for team managers as possible influences on response rate. Qualitative data found a majority of those sampled reported actively working towards becoming trauma-informed with training, trauma-focused therapies and team working practices. Of the remainder who reported they were not currently actively working towards becoming trauma-informed, potential barriers reported included a current lack of training, a lack of time for TIC tasks due to service-related pressures, or a lack of TIC in partner organisations. Thus the present data highlights that the current baseline for this NHS mental health Trust is that the sampled team managers/equivalents on average agree that the Trust provides TIC; it is hoped that the opportunities for further development highlighted by this report at the sub-category level (involving further service users, reviewing policies and providing TIC training and education) and the item level (see Appendix D) will be useful to the Trust in building on its development towards and commitment to trauma-informed care.

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# MAIN RESEARCH PROJECT

*Does information about health benefits of mindfulness influence mindfulness attitudes, intentions and practice? An online experiment.*

**Marika Fordonnell**

[msod20@bath.ac.uk](mailto:msod20@bath.ac.uk)

**Supervisor:** Prof. Paul Chadwick

Target journal: Journal of health psychology. Selected because previous similar works on narrative health communication have been published here, and because this journal accepts manuscripts with empirical analysis in health psychology.

**Word count:** 7081

## Introduction

Mindfulness originates from Buddhist principles, practice and scholarship (Brown & Ryan, 2003). While its translation into English definitions is complex, a common definition suggests mindfulness refers to the awareness that arises from paying purposeful attention to the present moment, and observing experience without judgement (Kabat-Zinn, 2003). Mindfulness is widely used as a mental health intervention, and systematic reviews and meta-analyses have found that engagement in mindfulness-based interventions (MBIs) such as Mindfulness-Based Stress Reduction or Mindfulness-Based Cognitive Therapy predicts small-moderate improvements in stress, anxiety, depression, mindfulness and wellbeing (Jayawardene et al., 2017; Sevilla-Llewellyn-Jones et al., 2018; Sommers-Spijkerman et al., 2021). There is also growing evidence that mindfulness can influence physical health, with research finding that engagement with mindfulness-based interventions can improve biomarkers associated with immune system response, immune cell ageing, and regulation of inflammation (Dunn & Dimolareva, 2022).

Along with the evidence base, opportunities to practice mindfulness have proliferated. While travel, cost or time barriers may prevent many from accessing in-person courses (Harvey & Gumpert, 2015), online interventions are increasingly available, with meditation apps such as Calm, Headspace or Insight Timer providing accessible guided practices. Yet despite increasing opportunity, the most recent nationally representative survey suggested that only 15% of UK adults have learnt mindfulness, while just 9% practice it (Simonsson et al., 2020). While figures worldwide appear to be increasing (e.g., a 2016 study indicated 14% of U.S. residents had practiced any kind of meditation in their lifetime, up from an estimated 4.1% in 2011 (Clarke et al., 2018; Cramer et al., 2016); these figures remain below those for other health-related practices; for example, 63% of UK adults report engaging in regular exercise (European Commission, 2018). As a result, there is likely potential for greater numbers to experience benefits from mindfulness than current estimates suggest.

With the benefits of mindfulness practice increasingly understood, mindfulness research is beginning to investigate predictors of engagement with MBIs. In a recent study of factors predicting mindfulness practice adherence, Canby et al. (2021) found that baseline depressive symptoms, conscientiousness and openness predicted home practice during the intervention. However, given personality traits are usually understood to be relatively stable, and depressive symptoms affected by a range of external and internal factors, it is less apparent how these factors could be used to promote engagement. While Canby et al. (2021) also found that group-related factors (e.g., secure emotional expression) and retreat attendance predicted adherence to mindfulness practice post-intervention, these factors may be less applicable to the online, individual MBIs available to most. Alternatively, strategies within online mindfulness interventions may promote engagement. Common engagement strategies here include the use of notifications or reminder emails that prompt the user to interact with the online MBI (Winter et al., 2022). Other strategies include providing activities (e.g., goal-setting, homework, and self-reflections), progress-tracking (for physical, psychological or meditation outcomes), instruction videos, feedback on practice, opportunities to contact other meditators, or the option to personalise content (e.g., app appearance) (Winter et al., 2022). However, a systematic review found there was no clear evidence that any of these engagement strategies led to increased mindfulness practice or user retention (Winter et al., 2022), and that variability in defining adherence or retention

across studies contributed to the difficulties in determining the impact of engagement strategies on either construct.

One strategy to promote engagement that has not yet to our knowledge been investigated in mindfulness research, is providing information about the health benefits of mindfulness. Though many course providers include this information in recruitment materials, the evidence is limited for how this information may influence early experiences of mindfulness, and specifically, for how this information may impact attitudes towards mindfulness practice or affect motivation and intentions to continue.

The Theory of Planned Behaviour (Ajzen, 1985, 1991) suggests our attitudes towards a behaviour influence our likelihood of practicing it, and that this relationship is mediated by our intentions to practice the behaviour. Therefore, if information about the health benefits of mindfulness could promote positive attitudes about the benefits of practice, this may in turn lead to increased intentions to practice and subsequent practice engagement (Canby et al., 2021). Alternatively, health benefit information could lead to unrealistic expectations of benefits, proving distracting, or leading to discouragement where benefits aren't immediately observable, thereby potentially reducing engagement and future intentions to practice. Moreover, the impact of health benefit information may depend on how it is communicated. Health messages may be structured in a statistical, logical, and conventional way, citing findings in the literature and statistics. Statistical formats are frequently used by public health communications, journal and news articles, and may benefit from a high perceived source credibility, whereby a communication source is perceived as trustworthy and expert (Harmon & Coney, 1982). The Elaboration Likelihood Model, a theory of attitude change, suggests that messages with high perceived source credibility are likely to promote positive attitudes and behavioural intentions that influence future behaviours (Petty et al., 2009; Petty & Cacioppo, 1986). Research suggests that perceiving health messages as having high source credibility predicts increased believability, reduced scepticism, and positive behavioural intentions (Emmers-Sommer & Terán, 2020; Rollins et al., 2021). For example, Emmers-Sommer and Terán (2020) found that the more credible participants found the source of a message about cancer risk, the more likely they were to elaborate on it, and the more positively they rated their intentions to raise awareness of the cancer, learn more about it, to get screened themselves and encourage others to be screened. Similarly, Wang et al. (2008), found that perceived credibility of information when viewing health messages on websites predicted positive evaluation of information, and increased self-reported likelihood to recommend the health advice to another. Thus, health messages communicated in traditional formats, using expert advice, statistics and research, may be perceived as credible, which may predict increased intentions to act on health information.

Alternatively, health messaging may be communicated via personal narratives from a person with personal experience. According to the Elaboration Likelihood Model, health messages that include cues which enhance the personal relevance of the message may receive greater attention and in-depth processing than messages with less personal relevance (Petty & Cacioppo, 1986). As narratives invite the audience to imagine themselves in the place of the person with experience, narrative formats may promote greater engagement with messages statistical formats (Braverman, 2008; Kreuter et al., 2007; Xu, 2023). For example, in Emmers-Sommer and Terán's (2019) study, participants who viewed a celebrity's personal cancer narrative reported greater intentions to learn more about the risks, raise awareness, undertake screening for cancer themselves and encourage others to do likewise, compared to participants who received this information in a traditional format written by a

medical doctor. Furthermore, a person with personal experience may be perceived as more similar to the target audience than a medical expert or researcher, and research suggests that perceiving a source of information to be similar to ourselves may positively impact our attitudes and intentions towards the health message (Rollins et al., 2021). For example, using structural equation modelling, Wang et al. (2008) demonstrated that higher perceived source similarity led to increased perceptions of credibility, which then predicted more positive attitudes towards the health information and higher self-reported intentions to act in line with the health message. Similarly, another study found a blog post about preventing skin cancer led to lower optimistic bias, and increased intentions towards protective behaviours when written in a narrative, rather than statistical format (Stavrositu & Kim, 2015). There may also be an advantage to combining these approaches; Maki and Feeley (2021) found that a HIV-testing health message that included both statistical and narrative information was superior to either approach alone in predicting increased intentions to seek HIV testing, with similar results found in another study of perceptions of HPV risk (Nan et al., 2015).

Research on the impacts of narrative or statistical health communications has largely been applied to cancer risk; therefore about a specific risk, and promoting occasional (usually screening-based) behaviours, as opposed to more commonly practiced health promotion behaviours like exercise, or meditation. Perrier and Martin Ginis (2018)'s systematic review indicates that fourteen studies have found narrative health messages predict increased (non-screening) health behaviours. However, the evidence base is small, and has evaluated the effect of health messaging formats where applied to vaccination, substance use, sun protection, sexual health behaviour, and injury prevention (Perrier & Martin Ginis, 2018); no study to our knowledge has investigated the impact of health benefit information (in narrative or statistical formats) about mindfulness on mindfulness attitudes, intentions or behaviours.

Given the evidence suggests that health information communicated in statistical and narrative formats can promote positive attitudes and behavioural intentions, the aim of this study was to investigate the impact of statistical and narrative health benefit information (compared to no health benefit information) on attitudes, motivation, and intentions towards mindfulness. We were also interested in whether receiving this information impacts immediate mindfulness practice duration, and whether participants choose to download a practice. Specifically, we aimed to investigate the impact of this information for students; recent reports suggest that self-reported mental health conditions in student populations were seven times higher in 2021 than 2011, and a recent report by Student Minds suggests 57% of students describe experiencing a mental health difficulty. As such, with mindfulness showing demonstrable evidence for improving mental health outcomes, finding ways to promote engagement with mindfulness could have positive mental health impacts in this population (Lewis & Bolton, 2023; Student Minds, 2023). Furthermore, attending university may provide a 'moment of change'; where existing habits are broken and new habits form, providing an opportunity for integrating new practices such as mindfulness into daily life (Verplanken et al., 2018).

We hypothesised that people randomly allocated to receive information on the health benefits of mindfulness will:

1. report more positive attitudes towards mindfulness practice after receiving the information, compared to a no-information control group.

2. report greater motivation and intentions towards practicing mindfulness after receiving the information, compared to a no-information control group.
3. demonstrate greater practice adherence, operationalised in terms of length of time on the guided practice audio page, and more downloads of a mindfulness practice audio, compared to a no-information control group.

## Method

### Participants and PPE

The University of Bath Digital and Data Science Research Ethics Committee provided ethical approval for this project (project code 0078-609) (see Appendix A). Participants were eligible to participate if they met the inclusion criteria of being University of Bath students, 18 years or older, and had not previously completed a mindfulness course of four weeks or longer. Participants completed the study online, and were reimbursed £5 for their time via bank transfer.

A University of Bath student with previous experience of completing a mindfulness course was recruited to co-create the health benefit information materials, and review the survey. They were recruited via email, with a mindfulness teacher at the university emailing the recruitment advert to previous mindfulness course completers. They were reimbursed £20 for their time.

GPower was used to calculate sample size, power and budget calculations in consultation with a statistics professor; based on effect sizes from previous research, power calculations were based on the motivation scale, which suggested that with a sample of 100 (50 per condition), and with the  $\alpha$  set as .05, and  $\beta$  set at .80 (the standard values for each), Cohen's  $d$  would be .50, and sufficient to detect a difference of 1.1 points on the motivation scale between participants. After paying a person with personal experience (see Design and Procedure, below), £480 was available for participant payment. Previous experience and consultation with the research team, peers and PPE suggested £5 was an appropriate reimbursement amount for participants, thus target recruitment was 96 participants. Participants were recruited by advertising the study on posters and visual display screens on campus (including in the library, eating spaces, sports centre, psychology building, and departments of health and social sciences, management, science and engineering). Participants were also recruited in person, approached at campus events (i.e., Christmas fair) and eating spaces with the recruitment poster by the main researcher and two apprentices.

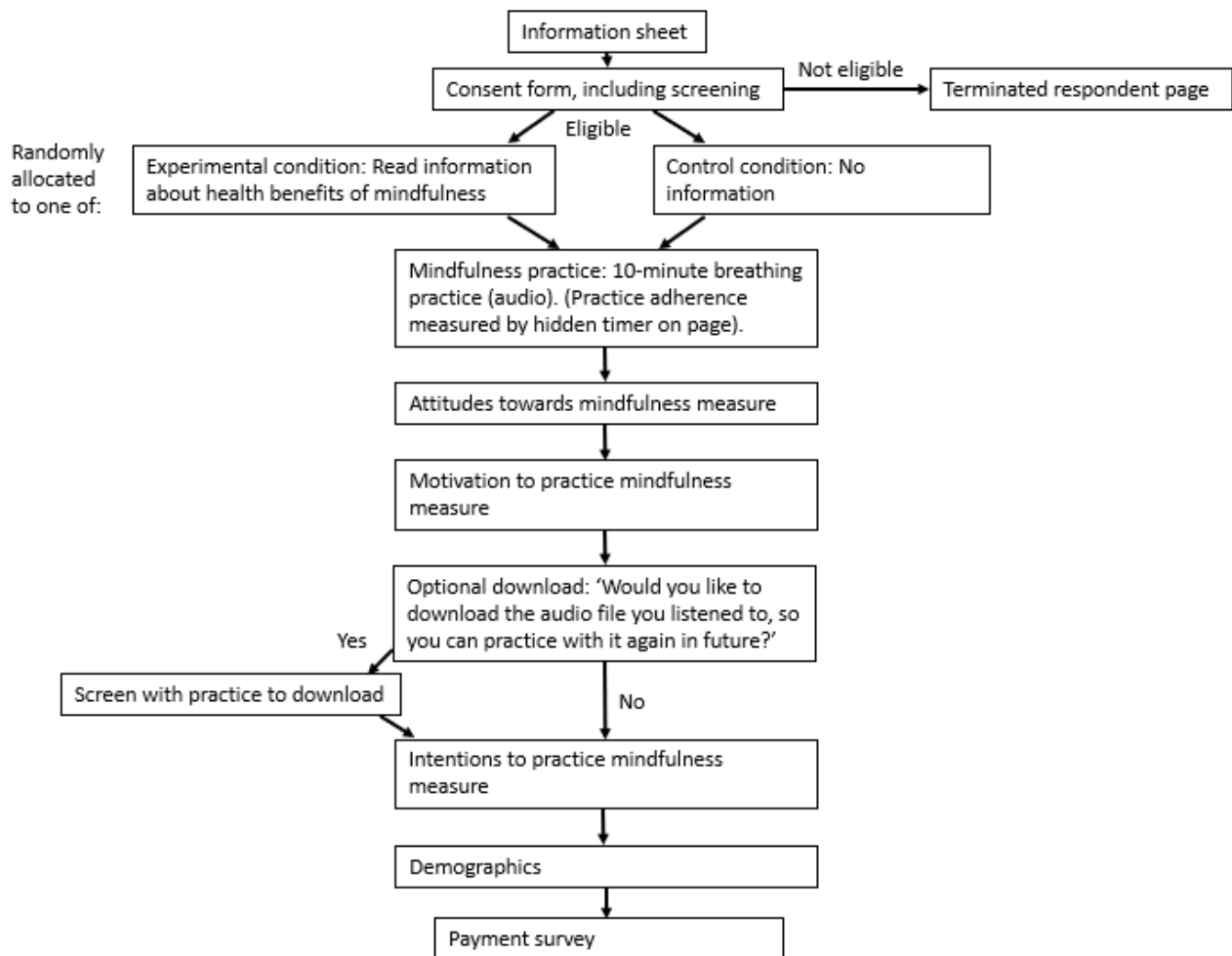
### Design and Procedure

For a diagram of our procedure, see Figure 1, below.



**Figure 1**

*Experimental procedure*



*Note: For all pages and measures, participants advance to the next page by pressing the 'next' button. As such, practice adherence captures the time participants spend on the guided audio meditation practice page from the time they reach this page, until the time they press the 'next' button. There is no automatic advancement. All study components (from information sheet to payment survey) were completed in a single session.*

Those who were not eligible to participate (see above for criteria) were redirected to a page with a termination message (see Appendix E). For those eligible, in this between-subjects design, participants were randomly assigned to one of two conditions – randomisation was completed by QuestionPro, the survey software, which was set to randomly present one of two blocks (one with the health benefit information and mindfulness practice, and one with the mindfulness practice alone), and to evenly present blocks, to ensure an equal number of participants per condition. In the experimental condition, participants read information about the health benefits of mindfulness, in relation to mental and physical health (see Appendix B for text). This information was co-created with the lead researcher and a person with personal experience – it was 330 words long, and included a summary of the research findings for mental and physical health benefits of mindfulness, and a personal

testimonial by a University of Bath student about their experience of learning to practice, and the benefits they had experienced from mindfulness. In the control condition, participants received no information about the health benefits of mindfulness. After receiving this information, or receiving no information about mindfulness, participants were instructed to check their sound was working, then press play to complete a 10-minute guided practice on mindfulness of breath.

Participants completed the following outcome measures in this order:

#### *Practice adherence*

The amount of time participants spent playing the practice was used as an objective measure of practice adherence (while acknowledging that we cannot tell to what extent the participants were engaging with the practice during this time). This was automatically recorded by QuestionPro as the amount of time participants spent on the page with the guided practice (there was no other content on this page). The 10-minute practice was provided by the Free Mindfulness Project (Morgan, 2023), which offers mindfulness practices free to download and distribute for non-commercial purposes.

#### *Attitudes towards mindfulness meditation*

Attitudes towards mindfulness meditation was recorded with a scale from Crandall et al. (2019). Participants were asked: 'For me, to practice mindfulness meditation (each day in the forthcoming two weeks) is:'. This semantic differential scale used six items to assess attitudes towards mindfulness practice (harmful-beneficial, unpleasant-pleasant, bad-good, worthless-worthwhile, unenjoyable-enjoyable, a waste of time- an important use of my time), with responses measured on a five-point scale, with higher scores indicating more positive attitudes towards engaging in mindfulness practice. The scale is based on the Theory of Planned Behaviour (Ajzen, 1985), has been used with undergraduate students, and has shown good internal consistency.

#### *Motivation to practice mindfulness*

Motivation to practice mindfulness was assessed with a single item from previous PhD research (Fordonnell et al., 2022) asking 'How motivated do you feel right now to practice mindfulness?', with responses given on a 10-point scale from 1 (not at all motivated) to 10 (extremely motivated).

#### *Optional download*

As a further behavioural outcome measure, participants were asked 'Would you like to download the audio file you listened to, so you can practice with it again in future?'. If they selected yes, they proceeded to a screen which said: 'Click here to download the practice'. If they selected no, they proceeded onto the following question.

#### *Intentions to practice mindfulness*

Intentions towards practicing mindfulness were measured with four items used by Erbe et al. (2019) and based on the Theory of Planned Behaviour (Ajzen, 1985). Participants were asked the following questions, with the following answer options: 'I intend to practice mindfulness each day in the forthcoming week' (extremely unlikely, unlikely, likely, extremely likely), 'In the forthcoming week, how often do you plan to practice mindfulness for at least 5 minutes?' (0 days, 1-3 days, 4-6 days, every day), 'I will try to practice mindfulness for at least 5 minutes each day in the forthcoming week' (false, probably false, probably true, true) and 'I plan to practice mindfulness for at least 5 minutes each day in the forthcoming week' (strongly disagree, disagree, agree, strongly agree). Responses

were given on a four-point scale, using the response options above. This scale has been shown to have good internal consistency.

### *Demographics*

Lastly, participants completed measures of age ('what is your age?' - free text response), gender ('how would you describe your gender?' - free text response), and level of education ('what is your current level of education?' GCSEs or equivalent (secondary education), A levels or equivalent (sixth form/college education), undergraduate degree (i.e. Bachelors), postgraduate degree (i.e., Masters, or doctoral degree (i.e., PhD, or Professional Training Doctorate, e.g., DClin, DEng, EdD, DBA).

After completing these measures, participants were automatically redirected to the payment survey, so that payment details would be stored separately to survey responses. The payment survey provided space for participants to enter their details for bank transfer. Finally, participants viewed a debrief page, which explained the study's background, aims and the two conditions. This page also provided links to further mindfulness resources, information about the results of the study and payment procedure, and contact details of the main researcher, for any questions about payment or the research.

### **Ethics**

Recruitment materials (i.e., posters or screens around campus – see Appendix C) presented information about what participation would involve, the reimbursement amount and method, the eligibility criteria, link and QR code to the survey, and contact details of the lead researcher. Prior to starting the questionnaire, participants read an information sheet (see Appendix D) that provided information about the researcher, the study area, voluntary participation, confidentiality, anonymity, the right to withdraw, data publication, and the researcher contact details for any further questions. Participants answered questions about eligibility criteria (whether they were 18 years or over, a student at the University of Bath, and had not attended a 4-week (or longer) mindfulness course), before providing informed consent. If participants did not meet inclusion criteria, they were redirected to a termination page, that listed the inclusion criteria, that participants were not currently eligible to participate based on their answers, and provided further mindfulness resources, including links to Insight Timer, Headspace, Calm, and courses and workshops for better mental health at the university. Payment details were collected in a separate survey to participant responses. At the end of the payment survey, participants accessed debrief information (see Appendix E).

## Results

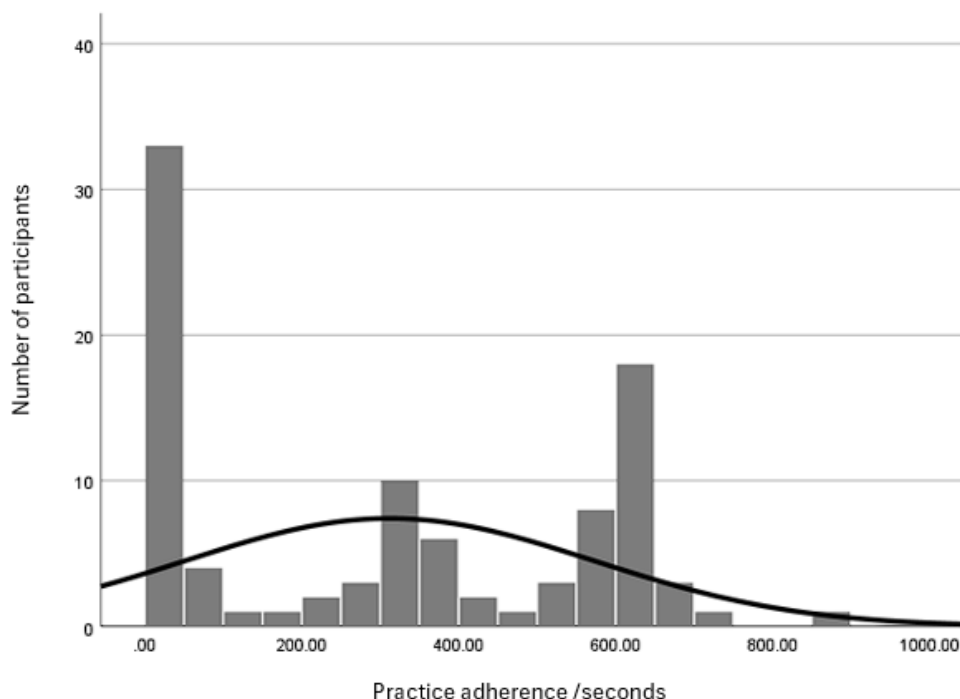
273 started the survey, with 97 completing (36% completion rate). 97 had completed by the time the main researcher could deactivate the survey. Of the final included sample of 97 (23 males, 71 females, 2 nonbinary, 1 other), participants were aged 18-31 ( $M= 20.8$ ,  $SD= 2.68$ ), and were on average educated at undergraduate level (with a range of in progress or completed education between sixth form and doctoral degrees).

### Data screening and descriptive statistics

Descriptive statistics are displayed in Table 1. Scale reliability analysis demonstrated good-to-excellent reliability for both the attitudes scale (Cronbach's alpha = .87) and the intentions scale (Cronbach's alpha = .94). For a histogram of practice adherence, see Figure 2.

**Figure 2**

*Histogram of practice adherence*



As can be seen above, practice adherence was not normally distributed, with peaks at participants skipping the practice page, or remaining on the page for the full duration of the practice, and fewer participants in between. Twenty-three participants had practice durations of above 600 seconds (three of these were over 660 seconds); given the mindfulness practice was 10 minutes, longer duration would not suggest longer practice, and as such these 23 were capped at 600 seconds. As twenty of the twenty-three participants who spent longer than 600 seconds on the page took no more than a minute longer, this could suggest that these participants were attending to the meditation practice, but perhaps took a few moments to set up their sound at the start, or a few moments to come out of the practice at the end. However, as no researcher was present with them at this time,

we cannot make any firm conclusions about whether those who took longer than 600 seconds were attending to the practice or not (a conclusion we also cannot make of any participant – see limitations).

Use of Levene’s test for equality of variance, histograms, and Shapiro Wilk tests demonstrated that almost all outcome measures demonstrated equality of variance and normal distributions; exceptions included that practice adherence was not normally distributed ( $W(97)=.82$ ,  $p<.001$ , and that the motivation measure violated the assumption of equality of variance ( $F=4.62$ ,  $p=.034$ ). To account for this, non-parametric Mann Whitney U tests were run for these outcomes, and are presented here. Attitudes and intentions were analysed with independent samples t-tests, and optional downloads were analysed with a Pearson Chi Square test. Lastly, independent samples t-tests demonstrated there were no differences between conditions in age, gender or education.

**Table 1**

*Descriptive statistics*

Construct (scale)	Overall sample mean (SD)	Health behaviour information mean (SD)	Control condition mean (SD)
Attitudes towards mindfulness practice (1-5)	3.69 (.80)	3.85 (.71)	3.52 (.85)
Intentions towards mindfulness practice (1-4)	2.29 (.79)	2.45 (.77)	2.13 (.79)
Motivation towards mindfulness practice (1-10)	5.43 (2.35)	5.71 (2.11)	5.16 (2.55)
Practice adherence (0-600 seconds)	302.47 (247.63)	225.90 (229.77)	377.49 (243.60)
Optional download (yes/no)	44 (45.4%) yes	26 (54.2%) yes	18 (36.7%) yes

*Note: For optional downloads numbers refer to number of participants who opted to download the practice. In brackets are the percentage of participants who chose to download the practice.*

**Effect of Health Benefit Information on Dependent Measures**

T-tests, Mann Whitney U tests (see above) and a Pearson Chi Square test was run to determine the effect of health benefit information about mindfulness on attitudes, intentions and motivation towards practice, practice adherence, and whether participants chose to download the practice they had listened to.

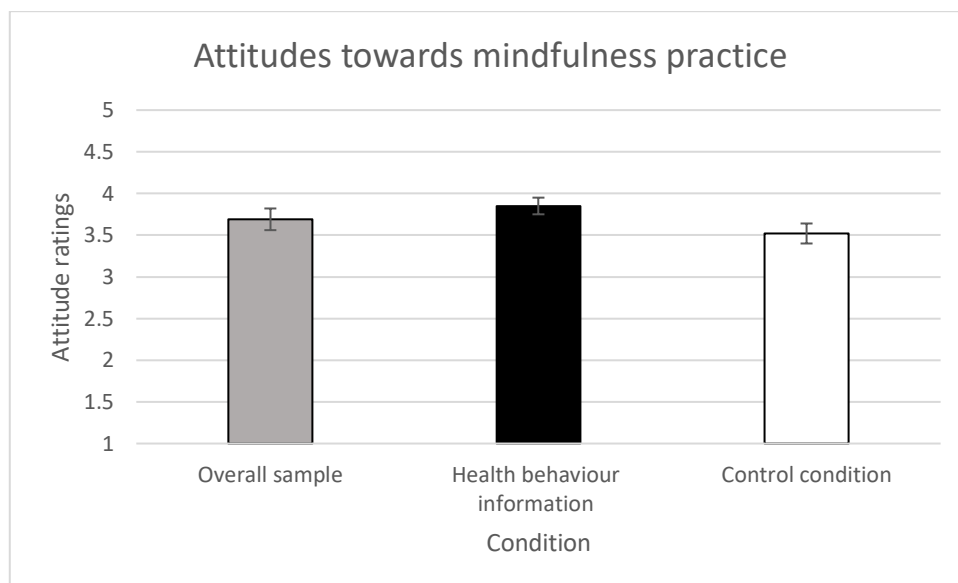
*H1: People randomly allocated to receive information on the health benefits of mindfulness will report more positive attitudes towards mindfulness practice after receiving the information, compared to a no-information control group.*

### Attitudes

An independent samples t-test showed a main effect of information on attitudes towards mindfulness practice. Participants who received information about the health benefits of mindfulness rated their attitudes towards mindfulness practice as significantly more positive than those who received no information ( $t(95)=2.070$ ,  $p=.041$ ,  $95\% CI=.01-.65$ ), with those receiving health benefit information scoring on average .33 more than those who received no information. Thus H1 was supported. For a plot of mean attitude towards mindfulness practice by group, see Figure 3.

**Figure 3**

*The effect of condition on attitudes towards mindfulness practice*



*Note: Bars represent means, error bars are standard errors. Higher values indicate more positive attitudes towards mindfulness practice.*

*H2: People randomly allocated to receive information on the health benefits of mindfulness will report greater motivation and intentions towards practicing mindfulness after receiving the information, compared to a no-information control group.*

### Motivation

A Mann Whitney U test showed that there was no difference in reported motivation to practice mindfulness between those who received mindfulness health benefit information vs. those who did not ( $U=1090.00$ ,  $p=.529$ ). This does not support H2.

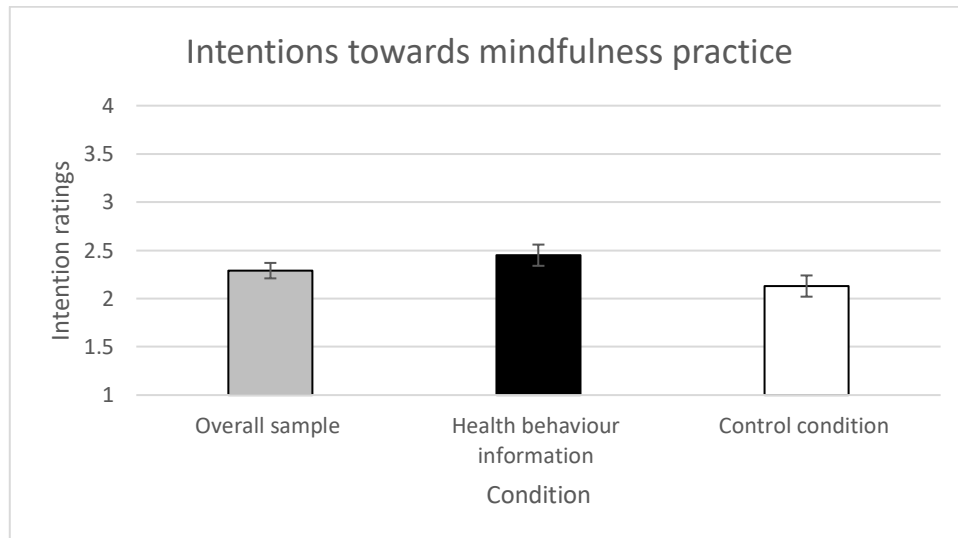
### Intentions

An independent samples t-test showed a main effect of information on intentions to practice mindfulness. Participants who received information about the health benefits of mindfulness reported greater intentions to practice mindfulness, compared to those who received no information ( $t(95)=2.001$ ,  $p=.048$ ,  $95\% CI=.01-.63$ ), with those receiving health benefit information scoring on

average .32 more than those who received no information. This finding supports H2. For a plot of mean intention towards mindfulness practice by group, see Figure 4.

**Figure 4**

*The effect of condition on intentions towards mindfulness practice*



*Note: Bars represent means, error bars are standard errors. Higher values indicate greater intentions towards mindfulness practice (i.e., more likely to practice in the forthcoming week).*

*H3: People randomly allocated to receive information on the health benefits of mindfulness will after receiving the information demonstrate greater practice adherence, operationalised in terms of length of time on the guided practice audio page, and more downloads of a mindfulness practice, compared to a no-information control group.*

#### Practice Adherence

A Mann Whitney U test demonstrated a significant difference in practice adherence between those who received health benefit information and those who did not ( $U=707.50, p<.001$ ), with those who received no information remaining on the practice page for an average of 152 seconds longer than those who received health benefit information. This finding does not support H3.

#### Optional download

A Pearson Chi Square test suggested that there was no significant difference in number of participants who downloaded the mindfulness practice between those who received health benefit information and those who did not ( $\chi(1)=.085$ ). 54.2% of those who received health benefit information downloaded the practice, compared to 36.7% of those who received no information. Similarly, this finding does not support H3.

## Discussion

This study aimed to understand the effect of providing information about the health benefits of mindfulness (in narrative and statistical formats) on attitudes and intentions towards practicing mindfulness, and on immediate mindfulness-related behaviours. Firstly, we predicted that people randomly allocated to receive information on the health benefits of mindfulness will report more positive attitudes towards mindfulness than those who received no information (H1). Secondly, we hypothesised that those randomly allocated to receive health benefit information would report increased motivation and behavioural intentions towards practicing mindfulness, compared to those who received no information (H2). Finally, we predicted that those who received health benefit information would spend longer on the guided practice, and would be more likely to download the practice afterwards, compared to those who did not access this information (H3).

Our findings suggest that H1 was supported, H2 partially supported, and H3 not supported. In support of H1, participants who accessed information about the health benefits of mindfulness rated their attitudes towards mindfulness practice as more positive, compared to those who did not access this information. This supports work by Wang et al. (2008) and Rollins et al. (2021) which finds that health messages including statistical and narrative formats can promote positive attitudes towards health behaviours. This study extends these previous findings, by adding that mindfulness health benefit information in these formats can promote more positive attitudes to mindfulness practice, compared to no information. While the between-group differences are not great, that there is a difference at all is notable given the brevity of the intervention, given research indicates that student and general public attitudes towards mindfulness tend to be fairly positive to begin with (Bamber & Schneider, 2022; Haddock et al., 2022; Laurie & Blandford, 2016), and given that individuals who voluntarily sign up to complete a mindfulness study are potentially more likely to have positive attitudes towards mindfulness than those who choose not to participate. As such, these findings indicate a brief statistical and narrative health message communicating the benefits of mindfulness can promote positive attitudes towards practice in university students.

Secondly, findings suggested that those who accessed mindfulness health benefit information reported greater behavioural intentions to practice mindfulness, though not self-reported motivation, compared to those who received no information (H2). These findings align with the Theory of Planned Behaviour (Ajzen, 1985), in suggesting that health information can positively influence attitudes and behavioural intentions. They also support previous research, which finds that statistical and narrative approaches can promote positive attitudes and intentions towards health behaviours (Perrier & Martin Ginis, 2018), and that narrative messages portraying the healthy behaviour predict positive behavioural intentions to practice that behaviour (Graaf et al., 2016). These findings extend this literature, by offering (attitudes and intentions towards) mindfulness practice as a novel target for narrative and statistical health messaging. Mindfulness practice provides a new context for these strategies, in being a health promoting (rather than risk reducing) behaviour, and being more associated with mental than physical health; with existing narrative and statistical research in mental health focused more on mental health stigma, or attitudes towards seeking therapy (Apolinário-Hagen et al., 2018; Demyan & Anderson, 2012; Tucker et al., 2022). Our findings indicate that statistical and narrative health messaging about the benefits of mindfulness could be a promising engagement strategy for universal mindfulness-based interventions; providing this information in recruitment



materials or in within-app information could promote positive attitudes and intentions towards practice. However, unexpectedly, there were no between-group differences in self-reported motivation. This may relate to the psychometric properties of the motivation measure, which consisted of a single item, and despite use in previous work (Fordonnell et al., 2022), was not a validated measure; thus its psychometric properties will be poorer in comparison to the intentions measure. Alternatively, the motivation measure appearing shortly after the guided practice may limit motivation to practice 'right now', regardless of information about health benefits.

Thirdly, contrary to H3, there was no significant difference between number of downloads of the guided practice between the groups. While 54.2% of those who received the information downloaded the practice, compared to 36.7% of those who did not, this difference was not significant. This lack of difference may be because practical factors might explain more of the variance in downloading behaviour; for example, participants may not have had a practical use for a downloaded audio file outside of an app, may prefer to find their own guided practices on meditation apps or YouTube, may have been wary of downloading unknown files to their phone, or may have been keen to receive their reimbursement and aware downloading a file may make this take longer. As such, practical factors may prove more influential than information condition alone in explaining downloads.

Furthermore, contradicting H3, those who received no information spent on average 152 seconds longer on the guided practice screen than those who received health benefit information. This means the effect of health benefit information on attitudes and intentions cannot be explained by those receiving the health benefit information practicing longer, and this in turn influencing attitudes and intentions. Instead, those who received the health benefit information spent less time on the practice page. This could be explained by those in the experimental condition, on seeing the health benefit information, worrying the survey would take a long time, and therefore making the decision not to practice for as long, or at all, compared to those in the control condition (especially if they were in a hurry; many participants were recruited in lunchtimes on campus). Alternatively, it could be that viewing a list of benefits and a positive narrative could have been interpreted as an open attempt to persuade, and therefore experienced as 'pushy' or 'nagging' and as such rejected by participants. However, against this reading is the finding participants demonstrated more positive attitudes and intentions towards mindfulness practice after receiving the health benefit information, in addition to Graaf, Sanders & Hoeken's (2016) review which suggests that an overtly persuasive message format does not appear to reduce narrative persuasion.

A lack of finding effects on behaviour is moreover consistent with the literature that frequently finds impacts of statistical and narrative health messages on health-related attitudes and intentions, but less reliably finds impacts on immediate behaviours. In line with the Theory of Planned Behaviour (Ajzen, 1985), while a path to behaviour change includes attitudes-intentions-behaviour, intentions alone are limited in their ability to explain behaviour, with some meta-analyses suggesting intentions account for just over a quarter of the variance in health-related behaviours, leading to what some have termed the intention-behaviour gap (Ajzen, 2020; Sheeran, 2002). In addition to external factors, such as time restrictions, the link between intentions and behaviour might depend on how close the measured behaviour is conceptually to the measured intention. For example, in our study, intentions to practice in the next week perhaps isn't conceptually similar enough to duration of immediate practice (especially as this was measured first) or immediate downloading, for similar effects of health benefit information to have been observed for both. Perhaps, had the technology and resources been

available to follow participants up in the next week, self-reported mindfulness over the following week could have shown an effect of health behaviour information.

Strengths of the present study include its random allocation to conditions, collaboration with a person with personal experience of a mindfulness course at the same university as participants, use of narrative and statistical formats in the health message, and use of a range of outcome measures informed by the Theory of Planned Behaviour. A limitation of our study is that sample characteristics limit generalisability. The present sample was young, largely female, and in higher education. Also, we did not collect ethnicity data; as such, we cannot be sure whether the observed effects would be similar for people of all ethnicities. This is particularly important in light of recent work suggesting that mindfulness, being translated for the UK and US, has adopted ideologies of neoliberalism, post-racialism, healthism and whiteness, whereby talk of health benefits reinforces narratives about health being an individual responsibility to maintain, ignoring the structural inequalities that make this unachievable for less privileged groups (Karelse, 2019). Collecting ethnicity data in future work will be particularly important to understand whether providing information about health benefits of mindfulness is helpful for all, or only for some.

With regards to generalisability, while we have no pre-intervention measure of attitudes towards mindfulness (a limitation restricting our understanding of pre-study attitudes), a young, largely female sample in higher education represents a population demographically likely to have positive views towards mindfulness. A recent study found correlations between education level and perceived credibility of mindfulness (Gulash, 2023), while a recent systematic review suggests that university educated individuals are over-represented in mindfulness courses compared to in national samples (Waldron et al., 2018). As such, our findings may generalise to other populations who have positive pre-existing views of mindfulness. It could be predicted that these findings would also generalise to those who have neutral views; if anything people with neutral views exposed to health benefit information may demonstrate more of a positive change in attitudes and intentions than those with pre-existing positive views. As for populations with pre-existing negative views on mindfulness, generalisability is more uncertain. On the one hand, health benefit information may lead to a greater change in attitudes or intentions towards practice in this group compared to those with neutral or positive attitudes. Alternatively, to the extent health benefit information could elicit counter-arguing, and a strengthening of existing attitudes, providing health benefit information could prove ineffective, or even counterproductive – though providing this information in narrative form may be less likely to increase counter-arguing compared to statistical forms (Niederdeppe et al., 2012; Yan, 2022).

Secondly, while the study being online likely assisted with accessibility and therefore recruitment, it also means we had no control over the participant environment. As a result, we had no control over whether participants experienced distractions or interruptions when completing the study, which could have reduced the effect of the health benefit information on outcome measures. We also have no independent check on whether participants were reading the health benefit information or engaging in mindfulness practice. While our measure of practice adherence has been used in a number of online MBI trials to ‘objectively’ measure home practice, and may have an advantage over self-reported practice in being less prone to inflation (Flett et al., 2019; Ribeiro da Silva dos Santos, 2020), it also has the disadvantage in that time spent on a page cannot tell us the extent to which someone has engaged with a practice. Though it is debatable whether we can ever know for sure whether someone is engaging in a practice, given this is an internal process, we are still less certain of this when

someone completes an experiment on their phone in their own time, compared to when they complete it in a laboratory setting. As such, future work could consider using a laboratory setting, to establish more control over whether participants are reading and engaging in meditation practice. Alternatively, where a laboratory setting is impractical, future online research could use a range of attention checks – for example, playing a sound or unusual word at some point in the practice, followed by a survey question on which sound or word participants had heard (providing this is not too distracting). Similarly, following the health benefit information an attention check could be included asking participants what was the main message of the text they had just read. Furthermore, future work could consider self-report and objective measures of mindfulness practice engagement combined, alongside potentially considering a measure of self-reported mindfulness practice quality instead of quantity alone to understand engagement (though there are concerns that especially novice meditators may be poor estimators of their own practice quality (Grossman, 2011; Hassed et al., 2021)). Measures such as these may help to understand participant engagement with the health benefit information and practice, where participants cannot be seen by the researcher during participation.

Thirdly, using a no information control condition is a limitation, in that we cannot conclude with certainty that the observed effects were a result of reading about health benefits of mindfulness, compared to reading any information about mindfulness, or reading at all. While the decision for a no-information control was taken to avoid unintended effects of a control text (e.g., a ‘neutral’ history of mindfulness prompting reactions based on religion, or a sceptical text reinforcing negative beliefs or promoting counter-arguing), the alternative of a no information control may itself have resulted in unexpected effects, for example, whether participants were more likely to skip through a practice after reading to avoid the experiment taking too long, compared to those not given a text to read. In future experiments, a stronger control could be designing a text about mindfulness that is either balanced (containing a proponent and sceptic of mindfulness), or neutral in another sense (e.g., considering the meaning of mindfulness, or an account of a mindfulness centre). These controls could control for the number of times the word ‘mindfulness’ is used, to avoid a priming effect, and have the same word count, to aim for the key difference between passages being the presence or absence of health benefit information.

Fourthly, in including both narrative and statistical messaging, our findings cannot distinguish if either was more effective in influencing attitudes and intentions. Similarly, that we did not include measures of perceived personal relevance or credibility limits our ability to determine whether either was more effective in influencing outcomes. Future research could inform the Elaboration Likelihood Model (Petty & Cacioppo, 1986) by including measures of perceived personal relevance and credibility for those receiving health benefit information, and expand the conditions so as to have one narrative format, one statistical format and one combined format, so as to separate out the influence of each kind of message presentation. In addition, while the Theory of Planned Behaviour was considered in terms of the effect of health information on attitudes, intentions and (immediate) behaviours, it is possible that a narrative account from another university student of how they learned to meditate could also impact perceived subjective norms or even perceived behavioural control; future work could incorporate measures of these constructs, to understand whether mindfulness health benefit information could also influence intentions via other pathways.

Fifthly, while attitudes were more positive and intentions to practice greater for those who received information about the health benefits of mindfulness, and while these measures are validated, and demonstrated good internal consistency, there are no indicators of clinically meaningful change. This makes it difficult to tell whether the observed differences are meaningful, or would translate to differences in behavioural outcomes. Future research could include a follow-up; if participants at follow-up demonstrated a difference in self-reported mindfulness practice, or mental health outcomes such as stress or anxiety (though this would likely require a more in-depth intervention), this could inform whether receiving information about health benefits could lead to a clinically meaningful difference in outcomes for a student population.

Lastly, order effects may have influenced our results. For example, it is difficult to be certain whether the experimental group would show more positive attitudes and intentions compared to the control group, had participants not accessed the information *and* accessed a guided practice. This means it is possible that individuals may need only health benefit information, or may need both health benefit information and exposure to a brief practice for attitudes and behavioural intentions to be influenced. Future studies could resolve this point by randomising the order of tasks following the health message for each participant.

## Conclusion

In conclusion, this study aimed to understand whether providing information about the health benefits of mindfulness can influence attitudes towards practice, intentions to practice, and immediate practice-related behaviours in a sample of UK university students. Findings suggested that messages about the health benefits of mindfulness practice communicated in statistical and narrative formats predicted more positive attitudes and intentions towards practicing mindfulness, did not increase practice adherence (though time spent on the page cannot inform us about quality of engagement), and had no effect on immediate motivation or downloading behaviour, compared to those who viewed no information.

As the benefits of mindfulness are increasingly well-known, this study contributes to the growing literature on which strategies may promote engagement with mindfulness-based interventions. In evaluating the effect of providing information to individuals about the health benefits of mindfulness, this work demonstrates that communicating these benefits in statistical and narrative forms may positively impact attitudes towards mindfulness and intentions to practice. That attitudes and intentions are affected by this information is consistent with the Theory of Planned Behaviour, and suggests a potential pathway towards promoting behaviour change, alongside offering a new health context in which statistical and narrative messaging may influence outcomes.

With regards to clinical implications, this study suggests that those looking to recruit for mindfulness based interventions may benefit from advertising the health benefits of mindfulness in both statistical and narrative formats, as doing so may, at least in the short term, lead to more positive attitudes towards mindfulness practice, and intentions to practice. The present findings indicate that health benefit information may not predict higher immediate practice duration or downloading behaviour, however cannot comment on whether this kind of health messaging may influence other mindfulness-related behaviours, such as scanning a QR code to access information about a mindfulness-based intervention, downloading a mindfulness app, or practicing mindfulness in the following days or weeks – all potential areas for future research. Future research may extend this work, by comparing narrative and statistical information to understand if one is more effective in this context, and by incorporating other and longer-term behavioural outcomes, to understand whether learning about the benefits of mindfulness can translate into mindfulness course engagement or practice adherence.

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## APPENDICES

## Literature Review Appendices

### Appendix A: Search strategies by database

#### *PubMed Search strategy*

((Mindful\*[Title/Abstract]) OR ("Mindfulness"[Mesh])) AND (((((((practic\*[Title/Abstract]) OR (adher\*[Title/Abstract])) OR (compliance[Title/Abstract])) OR (complied[Title/Abstract])) OR (complying[Title/Abstract])) OR (comply[Title/Abstract])) OR (((("Health Knowledge, Attitudes, Practice"[Mesh]) OR ("Treatment Adherence and Compliance"[Mesh:NoExp])) OR ("Patient Compliance"[Mesh])) OR ("Practice, Psychological"[Mesh]))) AND (((((measure\*[Title/Abstract]) OR (questionnaire\*[Title/Abstract])) OR (scale\*[Title/Abstract])) OR (survey\*[Title/Abstract])) OR ("Surveys and Questionnaires"[Mesh:NoExp]) OR ("Weights and Measures"[Mesh]))

#### *APA PsycInfo Search strategy*

((IndexTermsFilt: ("Mindfulness"))) OR ((title: (mindful\*)) OR (abstract: (mindful\*)) OR (kw: (mindful\*))) AND (((IndexTermsFilt: ("Practice"))) OR ((IndexTermsFilt: ("Treatment Compliance")))) OR ((title: (practic\*)) OR (abstract: (\*practic)) OR (kw: (\*practic))) OR ((title: (adher\*)) OR (abstract: (adher\*)) OR (kw: (adher\*))) OR ((title: (compliance)) OR (abstract: (compliance)) OR (kw: (compliance))) OR ((title: (complied)) OR (abstract: (complied)) OR (kw: (complied))) OR ((title: (complying)) OR (abstract: (complying)) OR (kw: (complying))) OR ((title: (comply)) OR (abstract: (comply)) OR (kw: (comply)))) AND (((IndexTermsFilt: ("Questionnaires"))) OR ((IndexTermsFilt: ("Measurement")))) OR ((IndexTermsFilt: ("Rating Scales"))) OR ((IndexTermsFilt: ("Surveys"))) OR ((title: (survey\*)) OR (abstract: (survey\*)) OR (kw: (survey\*))) OR ((title: (measure\*)) OR (abstract: (measure\*)) OR (kw: (measure\*))) OR ((title: (scale\*)) OR (abstract: (scale\*)) OR (kw: (scale\*))) OR ((title: (questionnaire\*)) OR (abstract: (questionnaire\*)) OR (kw: (questionnaire\*))))

#### *Web of Science Search Strategy*

Q Mindful\* (Topic) and Adher\* OR Practic\* OR comply OR complying OR compliance OR complied (Topic) and Measure\* OR Scale\* OR Questionn... Analyze Results Citation Report Create Alert

Topic Mindful\* Example: oil spill\* mediterranean

And Topic Adher\* OR Practic\* OR comply OR complying OR compliance OR complied Example: oil spill\* mediterranean

And Topic Measure\* OR Scale\* OR Questionnaire\* OR Survey\* Example: oil spill\* mediterranean

+ Add row + Add date range Advanced Search

x Clear Search

Appendix B: Psychometric property criteria from Terwee et al. (2007)

Property	Definition	Rating	Quality Criteria
1. Content validity	The extent to which the items in the questionnaire thoroughly cover the domain of interest.	+	Clear description of the measurement aim, the target population, concepts being measured and item selection are provided AND target population and investigators/experts were involved in item selection.
		?	Any of the above mentioned description is missing OR Only one group of people involved in item selection OR Doubtful design or method
		-	No target population involved
		0	No information found on target population involvement.
2. Internal consistency	The extent to which items in a subscale are intercorrelated, indicating they are measuring the same construct	+	Factor analyses were conducted on a sufficient sample size (7 times the number of items and greater than 100) AND Cronbach's alpha coefficients were computed for each dimension, with values between 0.70 and 0.95.
		?	No factor analysis OR Doubtful design or method
		-	Cronbach's alpha values less than 0.70 or greater than 0.95, even with appropriate design and method.
		0	No information found on internal consistency.
3. Criterion validity	The extent to which scores obtained from a specific questionnaire relate to a gold standard measure.	+	Compelling argument that the gold standard is reliable AND the correlation with the gold standard greater than or equal to 0.70.
		?	No compelling argument supporting that gold standard is "gold" OR Doubtful design or method.
		-	Correlation with the gold standard less than 0.70, even with appropriate design and method.

		0	No information found on criterion validity.	
4.	Construct validity	The extent to which scores on a specific questionnaire relate to other measures in a manner that conforms to theoretically derived hypotheses about the concepts being assessed.	<p>+</p> <p>?</p> <p>-</p> <p>0</p>	<p>Specific hypotheses were formulated AND at least 75% of the results align with the hypotheses.</p> <p>Doubtful design or method (e.g., no hypotheses).</p> <p>Fewer than 75% of hypotheses were validated, even with appropriate design and method.</p> <p>No information found on construct validity</p>
5.1.	Reproducibility_Agreement	The extent to which the scores on repeated measures are similar to each other (absolute measurement error).	<p>+</p> <p>?</p> <p>-</p> <p>0</p>	<p>MIC &lt; SDC OR MIC outside the LOA OR Compelling argument supporting the acceptability of agreement.</p> <p>Doubtful design or method OR MIC not defined AND no compelling argument supporting the acceptability of agreement.</p> <p>MIC ≥ SDC OR MIC equals or inside LOA, even with appropriate design and method.</p> <p>No information found on agreement.</p>
5.2	Reproducibility_Reliability	The extent to which patients can be differentiated from each other, even with measurement errors (relative measurement error).	<p>+</p> <p>?</p> <p>-</p> <p>0</p>	<p>ICC ≥ 0.70 OR Weighted Kappa ≥ 0.70</p> <p>Doubtful design or method (e.g. time interval not mentioned)</p> <p>ICC &lt; 0.70 OR Weighted Kappa &lt; 0.70, even with appropriate design and method.</p> <p>No information found on reliability.</p>

6.	Responsiveness	The capacity of a questionnaire to identify clinically significant changes over a period of time.	+	SDC or SDC < MIC OR MIC outside the LOA OR RR > 1.96 OR AUC ≥ 0.70
			?	Doubtful design or method
			-	Even with appropriate design or method, SDC or SDC ≥ MIC OR MIC equals or inside LOA OR RR ≤ 1.96 OR AUC < 0.70
			0	No information found on responsiveness.
7.	Floor or ceiling effects	The number of respondents who attained the lowest or highest possible score.	+	≤ 15% of the respondents attained the highest or lowest possible score.
			?	Doubtful design or method.
			-	> 15% of the respondents attained the highest or lowest possible score, even with appropriate design or method
			0	No information found on floor or ceiling effects.
8.	Interpretability	The extent to which qualitative interpretation can be applied to quantitative scores.	+	Mean and standard deviation scores presented for at least four subgroups of patients AND MIC defined.
			?	Doubtful design or method OR Less than four subgroups OR No MIC defined.
			0	No information found on interpretation.

*Note. AUC = area under receiver operating characteristics curve; ICC = intraclass correlation; LOA = limits of agreement; MIC = minimal important change; SDC = smallest detectable change; RR = Guyatt's responsiveness ratio. Doubtful design or method = lacking a clear description of the design or methods of the study, sample size smaller than 50 subjects, at least 50 subjects in every subgroup analysis, or any evident methodological limitation in the design or execution of the study*

Appendix C: Quality criteria for mixed method studies, from the Quality of Diverse Studies Tool (QuADS), Harrison et al. (2021).

QuADS Criteria	0	1	2	3
Theoretical or conceptual underpinning of the research	No mention at all	General reference to broad theories of concepts that frame the study. E.g. Key concepts were identified in the introduction section.	Identification of specific theories or concepts that frame the study and how these informed the work undertaken. e.g. key concepts were identified in the introduction section and applied to the study.	Explicit discussion of the theories or concepts that inform the study, with application of the theory or concept evident through the design, materials and outcomes explored. e.g. key concepts were identified in the introduction section and the application apparent in each element of the study design.
Statement of research aim/s	No mention at all	Reference to what the sought to achieve embedded within the report but no explicit aims statement.	Aims statement made but may only appear in the abstract or be lacking detail.	Explicit and detailed statement of aim/s in the main body of report
Clear description of research setting and target population	No mention at all	General description of research area but not of the specific research environment e.g. 'in primary care.'	Description of research setting is made but is lacking detail e.g. 'in primary care practices in region [x]'.	Specific description of the research setting and target population of study e.g. 'nurses and doctors from GP practices in [x] part of [x] city in [x] country.'
The study design is appropriate to address the stated research aim/s	No research aim/s stated or the design is entirely unsuitable e.g. a Y/N item survey for a study seeking to undertake	The study design can only address some aspects of the stated research aim/s e.g. use of focus groups to capture data regarding the frequency and experience of a disease.	The study design can address the stated research aim/s but there is a more suitable alternative that could have been used or used in addition e.g. addition of a qualitative or	The study design selected appears to be the most suitable approach to attempt to answer the stated research aim/s.

	exploratory work of lived experiences.		quantitative component could strengthen the design.	
Appropriate sampling to address the research aim/s	No mention of the sampling approach.	Evidence of consideration of the sample required e.g. the sample characteristics are described and appear appropriate to address the research aim/s.	Evidence of consideration of sample required to address the aim. e.g. the sample characteristics are described with reference to the aim/s.	Detailed evidence of consideration of the sample required to address the research aim/s. e.g. sample size calculation or discussion of an iterative sampling process with reference to the research aims or the case selected for study.
Rationale for choice of data collection tool/s	No mention of rationale for data collection tool used.	Very limited explanation for choice of data collection tool/s. e.g. based on availability of tool.	Basic explanation of rationale for choice of data collection tool/s. e.g. based on use in a prior similar study.	Detailed explanation of rationale for choice of data collection tool/s. e.g. relevance to the study aim/s, co-designed with the target population or assessments of tool quality.
The format and content of data collection tool is appropriate to address the research aim/s	No research aim/s stated and/or data collection tool not detailed.	Structure and/or content of tool/s suitable to address some aspects of the research aim/s or to address the aim/s superficially e.g. single item response that is very general or an open-response item to capture content which requires probing.	Structure and/or content of tool/s allow for data to be gathered broadly addressing the stated aim/s but could benefit from refinement. e.g. the framing of survey or interview questions are too broad or focused to one element of the research aim/s.	Structure and content of tool/s allow for detailed data to be gathered around all relevant issues required to address the stated research aim/s.
Description of data collection procedure	No mention of the data collection procedure.	Basic and brief outline of data collection procedure e.g. 'using a questionnaire distributed to staff'.	States each stage of data collection procedure but with limited detail or states some stages in detail but omits others e.g. the recruitment process is mentioned but lacks important details.	Detailed description of each stage of the data collection procedure, including when, where and how data was gathered such that the procedure could be replicated.

Recruitment data provided	No mention of recruitment data.	Minimal and basic recruitment data e.g. number of people invited who agreed to take part.	Some recruitment data but not a complete account e.g. number of people who were invited and agreed.	Complete data allowing for full picture of recruitment outcomes e.g. number of people approached, recruited, and who completed with attrition data explained where relevant.
Justification for analytic method selected	No mention of the rationale for the analytic method chosen.	Very limited justification for choice of analytic method selected. e.g. previous use by the research team.	Basic justification for choice of analytic method selected e.g. method used in prior similar research.	Detailed justification for choice of analytic method selected e.g. relevance to the study aim/s or comment around of the strengths of the method selected.
The method of analysis was appropriate to answer the research aim/s	No mention at all	Method of analysis can only address the research aim/s basically or broadly.	Method of analysis can address the research aim/s but there is a more suitable alternative that could have been used or used in addition to offer a stronger analysis.	Method of analysis selected is the most suitable approach to attempt answer the research aim/s in detail e.g. for qualitative interpretative phenomenological analysis might be considered preferable for experiences vs. content analysis to elicit frequency of occurrence of events.
Evidence that the research stakeholders have been considered in research design or conduct	No mention at all	Consideration of some the research stakeholders e.g. use of pilot study with target sample but no stakeholder involvement in planning stages of study design.	Evidence of stakeholder input informing the research. e.g. use of pilot study with feedback influencing the study design/conduct or reference to a project reference group established to guide the research.	Substantial consultation with stakeholders identifiable in planning of study design and in preliminary work e.g. consultation in the conceptualisation of the research, a project advisory group or evidence of stakeholder input informing the work.
Strengths and limitations critically discussed	No mention at all	Very limited mention of strengths and limitations with omissions of many key issues. e.g. one or two	Discussion of some of the key strengths and weaknesses of the study but not complete. e.g. several strengths/limitations explored but with	Thorough discussion of strengths and limitations of all aspects of study including design, methods, data



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strengths/limitations mentioned with limited detail.	notable omissions or lack of depth of explanation.	collection tools, sample & analytic approach.
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## Appendix D: Description of Measures

Measure	Description
<i>Self-report questionnaires</i>	
Toronto Mindfulness Scale (TMS) (2006)	<p>The TMS is an instrument that measures the capacity to invoke a mindful state. Consistent with the standard approach to administering the TMS as recommended by the developers of the scale, participants completed this 13-item questionnaire immediately following a mindfulness meditation “prime” with the following instructions: “For the next 15 minutes, please pay attention to your breathing and anything else that might arise during your experience.” The participant's responses are based on this mindfulness experience sample. For each item on the questionnaire, participants are asked to read each statement and indicate the extent to which he or she agrees with each statement (how well the statement describes what the participant just experienced; 0=not at all to 4 = very much). The TMS has two scales, Curiosity and Decentering. The Curiosity scale (score range 0–24) contains items that reflect an attitude of wanting to learn more about one's experience. The Decentering scale (score range 0–28) contains items that reflect a shift from identifying personally with thoughts and feelings to relating to one's experience in a wider field of awareness. The TMS has two unique dimensions, curiosity (e.g., “I was curious about my reactions to things”; <math>\alpha = .87</math>) and decentering (e.g., “I was aware of my thoughts and feelings without over-identifying with them”; <math>\alpha = .81</math>). The summed rating across all the scores represents the total state mindfulness score, with higher scores reflecting greater state mindfulness (<math>\alpha = .89</math>).</p>
State Mindfulness Scale (SMS) (2013)	<p>The State Mindfulness Scale reflects a conceptual model of mindfulness consistent with traditional Buddhist scholarship (Analayo, 2004; Bodhi, 1993) and Bishop and colleagues' (2004) consensus definition of mindfulness informed by earlier work on mindfulness and related constructs (e.g., Langer, 1989). The SMS is a self-report measure that consist of 21 items and uses a 5-point response scale (1 = not at all, 5 = very well). The measure assesses state mindfulness of mind (e.g., “I was aware of what was going on in my mind”; 15 items) and state mindfulness of body (e.g., “I noticed physical sensations come and go”; 6 items) immediately following a mindfulness experience (i.e., mindfulness induction).</p>

Mindful Attention Awareness Scale State version MAAS-S (2003)	Mindful Attention Awareness Scale State MAAS-S (2003). The state MAAS (Brown & Ryan, 2003) is a 5-item self-report questionnaire designed to assess the current or short-term experience of a state of mindfulness, specifically examining attention and observation of the present moment. The state MAAS items are inspired by the trait MAAS items, but items are phrased in a way to reflect the current or recent short-term experiencing of mindful attention. Example items include “I was finding it difficult to stay focused on what’s happening in the present.” Items are scored using a 7-point Likert-type scale (0 = not at all, 3= somewhat, 6 = very much). The state MAAS was validated for use with college students and community adults and has an internal consistency of $\alpha = .92$ (Brown & Ryan, 2003).
Meditation experiences questionnaire (MEQ) (2011)	The MEQ is a listing of 13 phenomenological experiences during meditation sittings reported with relatively high frequency by novice meditators in a prior study (Frewen et al., 2011), such as sleepiness, unpleasant thoughts, and feeling relaxed or calm. In this study, each of the 13 items was rated using the identical 1–5 Likert-type scale used for the TMS.
Practice Quality - Mindfulness (PQ-M) (2013)	The PQ-M measure is used to assess participants’ mindfulness practice quality, which is defined as a balanced perseverance/resolve in (a) receptive (b) present moment attention, during the act of formally practicing mindfulness meditation. Example items include: “During practice, I attempted to return to my present-moment experience, whether unpleasant, pleasant, or neutral” and “During practice I was actively avoiding or ‘pushing away’ certain experiences”. Participants are asked to rate the percentage of time during the previous meditation practice session that their experience reflected each statement (range = 0–100). The measure has shown adequate internal consistency reliability, predictive validity (e.g., predicting psychological health outcomes within an MBSR course), and convergent validity (e.g., correlating with measures of mindfulness). In addition, the PQ-M has been shown to increase over the course of mindfulness training. A total score was computed ( $\alpha = .81$ in the present sample), with higher scores indicating a higher level of practice quality.
Meditation Depth Questionnaire (MEDEQ) (2001)	The Meditation Depth Questionnaire is a 30-item self-report questionnaire assessing an experienced practitioner’s depth of meditation. Answers are rated on a five-point Likert-type scale ranging from “not at all” to “very strong”. This questionnaire covers five different aspects of meditation experiences: hindrances (e.g., restlessness), relaxation (e.g., calmness), concentration (e.g., attentive control over the mind), transpersonal qualities (e.g., feeling connected, bliss, and grace), and non-dual qualities (e.g., subject/object transcendence). The global score is used as an index of meditation depth.

Mindfulness Adherence Questionnaire (MAQ) (2021)	The 12-item Mindfulness Adherence Questionnaire is a self-report adherence to mindfulness-based practice occurring within the past week. The first two items measure formal practice in terms of frequency and average duration of practice (in mins). The remaining 10 items measure the quality of formal practice (e.g., When meditating, how much of the time were you practicing an accepting attitude toward what you were experiencing?) and informal practice (e.g., In your daily life, how much of the time were you practicing paying attention while working or studying?).
Meditation Depth Index (2019)	The Meditation Depth Index is used to evaluate the depth of meditation that practitioners achieve. The five levels of meditation depth include hindrances, relaxation, concentration, essential qualities, and nonduality, which are assessed by a set of 30 questions.
Meditative State Scale (2022)	The Meditative State Scale (MSS) consists of 43 items (12 reverse-scored), rated on a 5-point Likert scale ranging from 1 (not at all) to 5 (very much). The first one—cognitive (C)—mainly refers to keeping attention and reducing mental contents and mind wandering during meditative practice, such as “Thoughts disappeared little by little.” The affective (A) dimension is related to the appearance of feelings during the meditative practice, such as “I felt the exercise was boring.” The somatic (S) dimension is related to body awareness aspects, with items such as “It was difficult to maintain my posture.” The last dimension is the transcendent (T) one, which included different transcendent states that might occur during meditative practice, such as “I felt I expanded into an infinite wholeness.”
Neurophenomenological experiment MIMOSA self-report data (no name given) (2019)	After each block, participants were invited to rate their experience over 6 different dimensions, using a 7-point Likert-type item (Fig. 2d): Capacity to apply the meditation instructions, Stability of the mind, Clarity of the mind, Aperture of the field of awareness, Awareness of bodily sensations, and Wakefulness. Here we will limit our analysis to the dimensions featured in the phenomenological matrix: Stability, Clarity and Aperture. <sup>5</sup> Rating scales were thus introduced: “Compared to your usual experience, how would you rate the last block in terms of Stability/ Clarity/Aperture?”
Self-reported meditation quality (no name for scale) (2021)	This scale allows participants to judge the quality of their meditation practice each day along four experiential dimensions: physical relaxation or comfort, mental relaxation or comfort, attentional stability, and attentional vividness. Ratings were made on a scale ranging from 1 (very poor) to 5 (very good).

<p>Time Flow Mindfulness Questionnaire (2022)</p>	<p>The Time Flow Mindfulness Questionnaire is The TFMQ is a 42-item self-report instrument developed in order to assess the cognitive, emotional, bodily, contextrelated (environmental, social), and behavioral/action inputs experienced by the mind at three different times (stages) of the mindfulness practice: (1) preliminary stage (Before Practice), a sample item from this 8-item subscale is, “Before starting the breathing/meditation, I feel comfortable when I take the position”; (2) during stage (During Practice), a sample item from this 10-item subscale is, “During the activities of visualization/concentration on the present, I do not get carried away by any emotions I feel”; (3a) right after the practice (Short-Term Benefits), a sample item from this 10-item subscale is, “Right after finishing visualization/concentration activities on the present, I perceive a general sense of well-being”; (3b) after the practice in general life (Long-Term Benefits), a sample item from this 15-item subscale is, “Thanks to the activities of visualization/concentration on the present, I am more aware of what happens around me moment by moment”; (3c) after the practice at work (Benefits at Work), a sample item from this 15-item subscale is, “Thanks to the activities of visualization/concentration on the present, in difficult situations at work I can suspend my reactions and not act immediately.” Each block of items related to the five different time-related sections (1, 2, 3a, 3b, 3c) provides a specific lead-in that instructs respondents to relate statements to different time frames. The items were newly formulated by the authors, two of whom have personal experience with mindfulness meditation and Buddhist psychology, in order to cover the above different types of potential distractors across the three different time windows and assess the beneficial consequences of mindfulness. Items were rated on a 5-point frequency scale ranging from 1 (Never) to 5 (Always). Items were worded both positively and negatively in order to avoid response set. Negative items were reversed such that higher scores reflect greater levels of positive experiences associated to mindfulness(preliminary moments, during-the-practice, after-the-practice).</p>
<p>Two items for each facet of FFMQ (2015)</p>	<p>For the daily mindfulness measure, we selected two items for each facet of the FFMQ, again based on high loadings on the corresponding subscale in previous research (Baer et al., 2006). The chosen items were the original Items 1 and 20 for Observing, Items 12 and 16 for Describing, 23 and 28 for Acting with Awareness, 30 and 39 for Nonjudging, and 9 and 33 for Nonre- acting. To make the items suitable for daily assessment, we re- worded the items slightly to reflect relevance to the day that just passed. For instance, Item 1 of the FFMQ “When I am walking, I deliberately notice the sensations of my body moving” was re- worded into “When I was walking, I deliberately noticed the sensations of my body moving.” Other examples of selected items to measure mindfulness were, “It was hard for me to find the words to describe what I was</p>

	<p>thinking” (Describing), “I rushed through activities without being really attentive to them” (Acting with Awareness), “I thought some of my emotions were bad or inappropriate and I shouldn’t feel them” (Nonjudging), and “When I had distressing thoughts, I just noticed them and let them go” (Nonreacting). A total score for mindfulness was constructed by calculating the mean of the 10 items (range 1–5). The Cron- bach’s alpha of the daily mindfulness measure was .81 on the first day of the study. Also, the total of these 10 items assessed at baseline correlated highly with the total FFMQ score assessed at baseline (r .93). A factor analysis on the first day of the measurement period showed that the 10 mindfulness diary items loaded sufficiently on one factor representing mindfulness, with an average factor loading of .61, a minimum of .35, and a maximum of .75.</p>
<i>Behavioural tasks</i>	
Breath Counting Task (BCT) (2014)	<p>Following a 6 min resting baseline, participants count breaths from 1 to 9 repeatedly for 18 min. With breaths 1–8 they press one button, and on breath nine they press another. If they lose count, participants are instructed to press a button reserved for indicating self-caught mis- counting and begin again at one with the next breath. Every ~90 s (60–120 s range) experience sampling probes state mind wandering and meta-awareness, respectively, with 2 6-point Likert scales, “just now where was your attention? (completely on-task/off- task)” and “how aware were you of where your attention was? (completely aware/unaware).” Participants are then probed for their count.</p>
Metronome Task (2022)	<p>The Metronome Task aims to operationalise present-moment awareness: The metronome task was made up of unaccented isochronous auditory clicks (beats). Each beat lasted 19 milliseconds. Sequences of beats comprised the following inter-stimulus intervals (ISI): 2, 1.33, 1, 0.5, and 0.33 s and lasted 15 s. Participants were asked to let an accentuated rhythmic pattern emerge spontaneously (e.g., 1-2, 1-2, or 1-2-3, 1-2-3, etc.) and to report the number of beats the rhythmic pattern contained using a computer keyboard. They were also asked to respond as soon as the rhythmic pattern emerged.</p>

<i>Physiological observations</i>	
Body movement analysis (2021)	'By analyzing their movement, body movement analysis estimates breathing parameters (such as frequency, depth, rhythmicity, etc.) corresponding to a different concentration degree; detects sudden movements arising from the choice of an uncomfortable posture or muscle tension and correlating with the loss of concentration, and detects common mistakes in meditation such as slouching and incorrect performance of movement patterns adopted in a particular meditation technique.'
Mindful Watch (2017)	MindfulWatch provides real-time timing and progress estimation for the ongoing breath cycle, resulting in a continuous output that contains fine-grained information about the meditator's breathing. Specifically, in the current implementation of MindfulWatch, the system provides an estimation of both timing (e.g., has been inhaling for 2.5 seconds) and progress (e.g., 50% of the inhalation has been completed) every 0.2 seconds by analyzing the most recently sampled data. This biosignal can be used to drive on-the-fly feedback adaptation in future applications such as personalised guidance. MindfulWatch is able to accurately measure duration of inhalation and exhalation of each breath cycle that can be used to derive objective measures that are indicative of meditation efficacy.
<i>Self-report and behavioural tasks</i>	
Mindful Breath Attention Scores (MBAS) (2011)	MBAS are a self-report performance-based measure of individual differences in meditative concentration toward the breath in response to a breath-attention meditation (Frewen et al. 2008, 2010). During the practice of an eyes-closed meditation during which participants are instructed to attend toward the experience of breathing, a meditation bell is rung approximately every 3 min (e.g., three times during a 10-min meditation or five times during a 15-min meditation, the latter as was conducted in the present study). While keeping their eyes closed, participants are instructed to indicate at each time the bell is rung whether their attention is directed toward their breathing (as instructed) or whether instead their minds have wandered to other things such as "thoughts, emotions, plans, memories, etc". In the present study, participants did so by placing a "tick mark" on a sheet of paper in front of them to indicate an affirmative answer, leaving the sheet blank in order to answer "no". participants were instructed, while keeping their eyes closed, to place a "tick mark" on a sheet of paper in front of them to answer "yes," leaving the sheet blank to answer "no." MBAS were calculated simply by summing the number of times to which participants indicated they had been attending toward their breath at the time of the bell

	<p>chimes. Participants are instructed that it would be normal to find that their attention sometimes wanders away from their breath over the course of the meditation but that, should they become aware that their minds had wandered, they should “gently and non-judgmentally let-go of the object of their attention, bringing it back to the process of their breathing.” Such instructions are standard in guided mindfulness meditation practice. They were instructed, however, to only place a tick mark on their sheets if their minds had wandered away from directly attending toward their breathing at the time of the bell soundings. After logging whether their attention was directed toward their breathing at the time a particular bell is rung, participants are again reminded of the instruction to attend toward their breathing until the next bell, letting go of other objects of attention should they find that their minds wander in the meantime.</p>
<p>Mindful Awareness Task (MAT) (2023)</p>	<p>During the MAT, participants perform a 20-min mindfulness meditation in which they are instructed (a) to monitor a wide range of prominent present moment experiences (e.g., sensations, emotions, thoughts), and (b) to direct their awareness to their breath when they do not notice any experience. To measure attention and awareness during meditation, participants are also instructed (a) to verbally state a label describing each experience they notice (e.g., “warm,” “happy,” “worried”), and (b) to press a button whenever they notice their inhalation or exhalation (see Figure 2a). Notably, the MAT instructions are similar to instructions of several traditional Buddhist and contemporary forms of mindfulness sitting meditation, in which mental labeling of experience is used along with mindfulness of the breath</p>



## Appendix E: Characteristics of included Studies

Study Author	Year	Sample size	Gender Percentage	Age range	Location
<i>Toronto Mindfulness Scale (TMS) (2006)</i>					
Bieling, P. et al.	2012	84	58% Female	18-65	Ontario, Canada
Chandrasiri, C. et al.	2020	32	50% Female	18-65	Melbourne, Australia
Christopher, M.S. et al.	2014	14	50% Female	30-77	Oregon, USA
Frewen et al.	2011	187	73.8% Female	18-23	No info
Frewen, P.A. & Unholzer, F.	2014	95	50.53% female	18-20	Ontario, Canada
Frewen et al.	2016	1101	67.39% Female	?	North America/ Ontario, Canada
Garland et al.	2015	44			
Gotink et al.	2016	44	82.2% Female	19-38	Florida State University
Green, S.M. & Bieling, P.J.	2012	23	78.26% Female	53.65 AVG	Canada
Hadash et al.	2023	143	76.92% females	19-51	Israel
Hanley et al.	2022	52	90% female	20 AVG	Southeastern, US
Henry, C.L. & Crowley, S.L.	2015	21	71% female	18-54	Western US
Ireland, M.J.	2013	1121	59.3% Female	17-88	Online
Jones et al.	2023	101	75.3% Female	18-65	University of Bath
Kaufman et al.	2009	29	28.1% Female	18-76	Washington, DC
Kiken et al.	2015	235	74% Female	44.83 AVG	University of North Carolina

Study Author	Year	Sample size	Gender Percentage	Age range	Location
Knight et al.	2014	23	69.57% Female	20-62	Not mentioned
Lester, E.G. & Murrell, A.R.	2019	114	64.5% female	18-40	US
López et al.	2022	241	72.62% female	30.98 AVG	Spain
Mahmood et al.	2016	205 (54+90+61)	(94.44%, no info, 39.34%) female	(16-18, No info, 18-70)	Uni of Kent, online
Reed, P.	2019	118	52.54% female	18-49	UK
Rowe et al.	2016	117	71.79% female	22.3 AVG	UK
Ruscio et al.	2016	44	52.27% Female	44.81 AVG	Washington DC, US
Strohmaier et al.	2022	474	69% Female	18-69	Online
Lau et al.	2006	61	54.10% Female	22–70	Shambhala Mountain Center in Red Feather Lakes, Colorado
<i>State Mindfulness Scale (SMS) (2013)</i>					
Andrade et al.	2019	287	82.23% Female	18-64	online/Portugal
Argento, A. et al.	2020	144	100% Female	20.17 AVG	Not reported
Bravo, A.J. et al.	2018	299	79.9% Female	20.84 AVG	South East USA
Burton, J.P. & Barber, L.K.	2019	263	36.5% Female	21.67 AVG	Midwestern USA
Hadash et al.	2023	144	76.92% Female	19-52	Israel
Hadash et al.	2016	138	65.1% Female	19-65	northern Israel
Ilies et al.	2019	80	82.5% Female	18-51	UK university
Landau et al.	2022	194	82.5% female	26 AVG	UK

Study Author	Year	Sample size	Gender Percentage	Age range	Location
Lester, E.G. & Murrell, A.R.	2019	115	64.5% female	18-41	US
Lotan et al.	2013	53	65.4% Female	20-52	Haifa University, Israel
Lotfalian et al.	2020	60	50% Female	40.38 AVG	Washington DC
Seabrook et al.	2020	37	64.86% females	37.86 AVG	Australia
Sousa et al.	2021	20	100% Female	18-30	Natal, Brazil
Sprawson et al.	2020	48	no information	18-33	Not explicitly mentioned
Tang, R., & Braver, T. S.	2020	125	46 females	22-67	Online
Tanay, G., & Bernstein, A.	2013	353 (193+57+103)	(74.4%, 65.4%, 65.3%) Female	18-64	Haifa, Israel
Thomas et al.	2021	79	50.63% Female	25.30 AVG	Not explicitly mentioned
Upton, S. R., & Renshaw, T. L.	2019	153	76.47% female	18-60	southern US
<i>Mindful Attention Awareness Scale State MAAS-S (2003)</i>					
Ameli, R. et al.	2020	78	83%	23-49	Maryland, USA
Brown & Ryan	2003	92	74% Female	18-21	US
Fong, J.S.Y et al.	2022	77	96.1% female	21->50	Hong Kong, China
Hernandez-Ruiz, E. & Dvorak, A.L.	2021	114 (57+57)	(63.2%, 59.6%) Female	(19.33, 19.79) AVG	US
Krumholz et al.	2021	42	73.8% female	31.9 AVG	US

Study Author	Year	Sample size	Gender Percentage	Age range	Location
Masters-Waage et al.	2021	94	51.06% female	21.62 AVG	Singapore
Navarro-Haro et al.	2017	44	63.6% female	21-69	Zaragoza, Spain
Petter et al.	2014	198	66.67% female	13-18	Canada?
<i>Breath Counting Task (BCT) (2014)</i>					
Goldberg et al.	2020	97	70.8% female	47.61 AVG	Not specified (Mid-western university)
Hunkin et al.	2021	68	59% female	22.66 AVG	Australia?
Hunkin et al.	2021	68	58.82% Female	22.66 AVG	Not specified (Australia?)
Isbel et al.	2020	86	55.5% female in mindfulness training (MT), 69.7% female in computerized training (CT)	72 AVG for MT, 70 AVG for CT	Not mentioned
Levinson et al.	2014	453 (164+137+39+113)	(62% male, 38% male, 57% male, ?)	(17-65, 18-26, 29-67, ?)	US
Wong et al.	2018	127	59.68% female	23.3 AVG	Singapore
<i>Practice Quality - Mindfulness (PQ-M) (2013)</i>					
Del Re, A.C. et al.	2013	118 (99+19)	(80%/78%) females	sample 2: 49.64	USA
Goldberg et al.	2014	53	52.8% female	43.4 AVG	Not specified (Mid-western university)

Study Author	Year	Sample size	Gender Percentage	Age range	Location
Goldberg et al.	2020	96	70.8% female	47.61 AVG	Not specified (Mid-western university)
Soh et al.	2021	51	80.38% Female	29.82 AVG	Not explicitly mentioned
<i>Meditation experiences questionnaire (MEQ) (2011)</i>					
Frewen et al.	2011	187	73.8% Female	18-23	No info
Frewen, P.A. & Unholzer, F.	2014	95	50.53% female	18-20	Ontario, Canada
Frewen et al.	2016	1101	67.39% Female	?	North America/Ontario, Canada
Hunkin et al.	2021	68	58.82% Female	22.66 AVG	Not specified (Australia?)
<i>Meditation Depth Questionnaire (MEDEQ) (2001)</i>					
Gutiérrez et al.	2022	22	54.55% Female	26-67	Freiburg, Germany
Hölzel, B, & Ott, U.	2006	251	73% female	20.8-70.5	German and India
Ireland, M.J.	2013	1121 (550+571)	59.3% Female	17-88	Online
<i>Mindful Breath Attention Scores (MBAS) (2011)</i>					
Frewen et al.	2011	187	73.8% Female	18-23	No info
Frewen, P.A. & Unholzer, F.	2014	95	50.53% female	18-20	Ontario, Canada
Frewen et al.	2016	1101	67.39% Female	?	North America/Ontario, Canada

Study Author	Year	Sample size	Gender Percentage	Age range	Location
<i>Mindfulness Adherence Questionnaire (MAQ) (2021)</i>					
Hassed et al.	2021	337 (282+55)	(56.4%/80%) female	18.5/ 51.4 AVG	Australia
Kakoschke et al.	2021	505 (310+205)	60% female	18.6 AVG	Monash University, Melbourne Australia
<i>Body movement analysis (2021)</i>					
Kashevnik et al.	2021	17?	no information	no information	No information
<i>Meditation Depth Index (2001)</i>					
Wagner Robb et al.	2019	84	73% Females	57.8 AVG	Online
<i>Meditative State Scale (2022)</i>					
López et al.	2022	241	27.38% male	30.98 AVG	Spain
<i>Metronome Task (2022)</i>					
Gutiérrez et al.	2022	22	54.55% Female	26-67	Freiburg, Germany
<i>Mindful Awareness Task (MAT) (2023)</i>					
Hadash et al.	2023	143	76.92% females	19-51	Israel
<i>Mindful Watch (2017)</i>					
Hao et al.	2017	11	54.55% Female		Michigan, US
<i>Neurophenomenological experiment MIMOSA self-report/ self-reported phenomenological ratings (no name given) (2019)</i>					
Abdoun et al.	2019	50	38% Female	35-65	Lyon, France
<i>Self-reported meditation quality (no name for scale) (2021)</i>					

Study Author	Year	Sample size	Gender Percentage	Age range	Location
Zanesco et al.	2021	60	53.33% female	22–69	Shambhala Mountain Center in Red Feather Lakes, Colorado
<i>Time Flow Mindfulness Questionnaire (2022)</i>					
Petitta et al.	2022	340 (141+58+141)	(68%, 74%, 68%) Female	(44.73, 44.9, 44.73) AVG	No explicitly mentioned
<i>Two items for each facet of FFMQ (2015)</i>					
Snippe et al.	2015	83	69.5% female	40.6 AVG	No Information

## Appendix F: Quality of included studies

Authors	Year	1. Theoretical underpinning	2. Research aims statement	3. Setting & population clearly described	4. Study design appropriate for aims	5. Appropriate sampling for aims	6. Rationale data collection	7. Format & content of data collection tool	8. Description data collection procedure	9. Recruitment data provided	10. Justification for analytic method selected	11. Method of analysis appropriate for aims	12. Stakeholders considered	13. Strengths limitations critically discussed
<i>Toronto Mindfulness Scale (TMS)</i>														
Bieling et al.	2012	2	3	3	3	2	3	2	2	3	0	3	0	2
Chandrasiri et al.	2020	2	3	3	3	1	0	3	3	1	0	3	0	2
Christopher et al.	2014	3	3	2	3	3	3	3	2	3	0	3	3	1
Frewen and Unholzer	2014	3	3	2	3	1	3	3	3	3	0	3	0	2
Frewen et al.	2011	3	3	2	3	2	3	3	3	3	3	3	2	1
Frewen et al.	2016	3	3	3	3	2	3	3	3	3	2	3	0	3
Garland et al.	2015	3	3	1	3	1	0	3	2	1	3	3	0	2
Gotink et al.	2016	3	3	3	3	2	2	3	3	3	0	3	0	3
Green and Bieling	2012	3	2	2	3	2	1	3	3	3	0	3	0	1
Hadash et al.	2023	3	3	2	3	3	1	3	2	3	0	3	3	3
Hanley et al.	2022	3	3	3	3	3	2	3	3	2	0	3	0	3



Authors	Year	1. Theoretical underpinnin g	2. Research aims statement	3. Setting & population clearly described	4. Study design appropriate for aims	5. Appropriate sampling for aims	6. Rationale data collection	7. Format & content of data collection tool	8. Description data collection procedure	9. Recruitment data provided	10. Justification for analytic method selected	11. Method of analysis appropriate for aims	12. Stakeholders considered	13. Strengths limitations critically discussed
Henry and Crowley	2015	2	2	3	3	3	3	3	3	3	0	3	2	3
Ireland	2013	3	2	2	3	2	0	3	1	1	1	3	0	3
Jones et al.	2023	3	3	2	3	3	3	3	3	3	0	3	0	3
Kaufman et al.	2009	3	3	3	2	2	3	3	3	2	0	3	0	2
Kiken et al.	2015	3	3	2	3	2	2	3	2	1	0	3	0	1
Knight et al.	2014	3	3	2	3	2	3	3	3	1	2	3	1	3
Lau et al.	2006	3	2	3	3	3	3	3	3	3	2	3	0	3
Lester and Murrell	2019	3	2	3	3	3	3	3	2	2	0	3	0	2
López et al.	2022	3	3	3	3	3	3	3	2	3	3	3	3	2
Mahmood et al.	2016	3	3	2	3	2	0	3	3	1	0	3	0	3
Reed	2019	3	3	2	3	2	3	3	3	2	0	3	0	2
Rowe et al.	2016	3	3	2	3	3	3	3	3	2	0	3	0	2
Ruscio et al.	2016	3	3	3	3	2	3	3	3	3	0	3	0	3
Strohmaier et al.	2022	3	3	2	3	3	3	3	3	1	0	3	0	3
Tanay and Bernstein	2013	3	3	3	3	2	3	3	3	3	1	3	3	2

*State Mindfulness Scale (SMS)*

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Andrade et al.	2019	3	3	2	3	3	2	3	2	3	2	3	3	3
Argento et al.	2020	3	3	2	3	3	0	3	3	3	0	3	0	3
Bravo et al.	2018	2	3	3	2	1	2	3	2	2	0	3	0	3
Burton and Barber	2019	3	3	2	2	2	2	2	2	3	3	3	0	1
Hadash and Bernstein	2023	3	3	2	3	3	1	3	2	3	0	3	3	3
Hadash et al.	2016	3	3	3	3	2	2	3	3	2	3	3	3	3
Ilies et al.	2019	3	3	2	3	3	0	3	3	1	0	3	0	3
Landau et al.	2022	3	3	2	3	3	3	3	3	3	3	3	0	3
Lester and Murrell	2019	3	2	3	3	3	3	3	2	2	0	3	0	2
Lotan et al.	2013	3	2	2	3	2	3	3	3	2	0	3	0	3
Lotfalian et al.	2020	3	3	3	3	2	2	3	3	3	0	3	0	3
Masters-Waage et al.	2021	3	3	2	3	2	3	3	1	3	1	3	0	3
Seabrook et al.	2020	2	3	2	3	2	3	3	3	3	0	3	3	3

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Sousa et al.	2021	3	3	3	3	3	2	3	3	2	0	3	0	2
Sprawson et al.	2020	3	3	1	3	2	2	3	3	1	0	3	0	2
Tanay and Bernstein	2013	3	3	3	3	2	3	3	3	3	1	3	3	2
Tang and Braver	2020	3	3	1	3	2	3	3	3	2	0	3	0	2
Thomas et al.	2021	2	2	2	3	3	0	3	3	1	0	3	0	2
Upton and Renshaw	2019	3	3	2	3	3	3	3	3	3	0	3	0	2
<i>Mindful Attention Awareness Scale State MAAS-S</i>														
Ameli et al.	2020	1	2	3	2	3	3	3	2	3	0	3	0	3
Brown and Ryan	2003	3	3	3	3	2	2	3	3	3	3	3	2	0
Fong et al.	2022	3	3	3	3	3	2	3	2	3	1	3	0	1
Hernandez-Ruiz and Dvorak	2021	3	3	2	3	3	2	3	1	2	2	3	0	1
Krumholz et al.	2021	3	3	3	3	2	3	3	3	3	0	3	0	3
Masters-Waage et al.	2021	3	3	2	3	2	3	3	1	3	1	3	0	3

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Navarro-Haro et al.	2017	3	3	3	2	2	3	3	3	2	0	3	0	1
Petter et al.	2014	3	3	2	3	3	3	3	3	2	3	3	0	3
Tanay and Bernstein	2013	3	3	3	3	2	3	3	3	3	1	3	3	2
<i>Breath Counting Task (BCT)</i>														
Goldberg et al.	2020	3	3	1	3	2	3	3	2	3	1	3	0	3
Hunkin et al.	2021	3	3	2	3	3	3	3	3	3	3	3	3	2
Hunkin et al.	2021b	3	3	1	3	3	0	3	3	3	0	3	0	3
Isbel et al.	2020	3	2	1	3	1	1	3	3	1	0	3	0	2
Levinson et al.	2014	2	3	3	3	2	3	1	3	3	3	3	0	1
Wong et al.	2018	3	3	2	3	2	2	3	3	2	0	3	0	0
<i>Meditation Experiences Questionnaire (MEQ)</i>														
Frewen and Unholzer	2014	3	3	2	3	1	3	3	3	3	0	3	0	2
Frewen et al.	2011	3	3	2	3	2	3	3	3	3	3	3	2	1
Frewen et al.	2016	3	3	3	3	2	3	3	3	3	2	3	0	3

Authors	Year	1. Theoretical underpinning	2. Research aims statement	3. Setting & population clearly described	4. Study design appropriate for aims	5. Appropriate sampling for aims	6. Rationale data collection	7. Format & content of data collection tool	8. Description data collection procedure	9. Recruitment data provided	10. Justification for analytic method selected	11. Method of analysis appropriate for aims	12. Stakeholders considered	13. Strengths limitations critically discussed
Hunkin et al.	2021b	3	3	1	3	3	0	3	3	3	0	3	0	3
<i>Practice Quality – Mindfulness (PQ-M)</i>														
Del Re et al.	2013	3	3	2	3	3	3	3	1	3	3	3	3	1
Goldberg et al.	2014	3	3	1	3	2	3	3	3	3	1	3	0	3
Goldberg et al.	2020	3	3	1	3	2	3	3	2	3	1	3	0	3
Soh et al.	2021	2	2	1	3	2	1	3	3	1	0	3	0	3
<i>Meditation Depth Questionnaire (MDQ)</i>														
Gutiérrez et al.	2022	3	3	3	3	3	2	3	3	3	0	3	0	1
Hölzel and Ott	2006	3	3	3	2	3	3	3	2	3	3	3	0	1
Ireland	2013	3	2	2	3	2	0	3	1	1	1	3	0	3
<i>Mindful Breath Attention Scores (MBAS)</i>														
Frewen and Unholzer	2014	3	3	2	3	1	3	3	3	3	0	3	0	2
Frewen et al.	2011	3	3	2	3	2	3	3	3	3	3	3	2	1
Frewen et al.	2016	3	3	3	3	2	3	3	3	2	2	3	0	3
<i>Mindfulness Adherence Questionnaire (MAQ)</i>														

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Hassed et al.	2021	3	3	3	3	2	3	3	3	3	3	3	0	3
Kakoschke et al.	2021	3	3	3	3	2	3	3	3	3	2	3	0	3
<i>Body Movement Analysis (2021)</i>														
Kashevnik et al.	2021	2	3	0	3	0	3	3	3	1	0	N/A	0	2
<i>Meditation Depth Index (2019)</i>														
Wagner Robb et al.	2019	2	2	3	3	2	3	3	1	1	0	3	0	2
<i>Meditative State Scale (2022)</i>														
López et al.	2022	3	3	3	3	3	3	3	2	3	3	3	3	2
<i>Metronome Task (2022)</i>														
Gutiérrez et al.	2022	3	3	3	3	3	2	3	3	3	0	3	0	1
<i>Mindful Awareness Task (MAT) (2023)</i>														
Hadash et al.	2023	3	3	2	3	3	1	3	2	3	0	3	3	3
<i>Mindful Watch (2017)</i>														
Hao et al.	2017	3	2	3	3	1	2	3	2	3	3	N/A	0	1
<i>Neurophenomenological experiment MIMOSA self report/ self-reported phenomenological ratings (no name given) (2019)</i>														
Abdoun et al.	2019	3	2	3	2	2	0	1	2	1	2	3	1	2

Authors	Year	1. Theoretical underpinning	2. Research aims statement	3. Setting & population clearly described	4. Study design appropriate for aims	5. Appropriate sampling for aims	6. Rationale data collection	7. Format & content of data collection tool	8. Description data collection procedure	9. Recruitment data provided	10. Justification for analytic method selected	11. Method of analysis appropriate for aims	12. Stakeholders considered	13. Strengths limitations critically discussed
<i>Self reported meditation quality (no name for scale) (2021)</i>														
Zanesco et al.	2021	3	3	3	3	2	2	3	3	1	0	3	0	3
<i>Time Flow Mindfulness Questionnaire (2022)</i>														
Petitta et al.	2022	3	3	1	3	3	2	3	1	2	3	3	0	2
<i>Two items for each facet of FFMQ (2015)</i>														
Snippe et al.	2015	3	3	2	3	2	3	3	2	3	3	3	0	3

## Service-Related Project Appendices

### Appendix A: Information Sheet

#### Information sheet

Trauma-informed care is a strand of [the Trust's]'s culture change programme. The aim of this survey is to establish a baseline, identifying how we are currently working in a trauma-informed way and noting areas in which we can improve. By completing the survey you will be helping us to identify areas we need to develop in order to continue our journey to becoming a trauma-informed organisation. Being trauma informed is relevant to all teams/services within [the Trust], whether your work is clinical or business/administration focused, and we aim to collect responses from a wide range of teams.

The questionnaire should take up to fifteen minutes. If you agree to take part you can choose not to answer any questions that you do not want to and you are free to withdraw at any time before submitting the questionnaire. As questionnaires will collect no personally identifying information, data will not be identifiable from the dataset and as such cannot be withdrawn once submitted. Questionnaire responses collected across [the Trust] will be used to calculate an average of trauma informed practice for [the Trust], as well as breaking this down into averages on key domains of trauma-informed care, and for areas of the organisation (inpatient, prison, community or corporate). Data will be used to develop future training and development opportunities within [the Trust]. The findings will be written up as a report for the quality improvement team and anonymously published in an academic journal and also submitted for the completion of my doctorate in clinical psychology at the University of Bath. No individual teams will be identified in reports of the results. If you have any questions, if you are unable to access the questionnaire online (but would like to arrange a call to complete the survey) or would like to receive a report of the results, please contact Marike Fordonnell at [marike.fordonnell1@nhs.net](mailto:marike.fordonnell1@nhs.net)

Instructions: Please answer to the best of your ability from the perspective of your team/service and how it works. Remember that you are not evaluating your individual performance, but rather, the practices of the service as a whole. Some items in the questionnaire may not be relevant for your team's work – in this case, you can select 'not applicable in my role'. The word 'Team' is used in a number of items – please note this may also refer to a service or department. When responding to questionnaire items, please answer based on your experience of your service over the past 6 months. Please answer as honestly and accurately as possible.



## Appendix B: Consent form and team demographic information

The purpose of the survey has been explained to me and I have received enough information about the survey to make a decision about my participation.

I understand that my participation in the survey is voluntary and that I can withdraw from it at any time until submitting the questionnaire (due to its anonymised nature) without giving a reason.

I understand that small parts of my written feedback may be quoted anonymously when the results of the project are reported

I understand that my data will be used to support other research in the future, and may be shared anonymously with other researchers. I agree for anonymised data that I provide to be used in reports for publication, including for my submission for my doctorate in clinical psychology to the University of Bath.

If you consent to participate, please tick the box below. If you would prefer not to participate at this time, please close your browser.



In which locality do you work? \*



BANES



Bristol



CAMHS



Corporate (including Estates, Facilities & Management)



North Somerset



Secure



South Gloucestershire



Specialised (including Prison services)



Swindon



Wiltshire

In which area of the organisation do you work? \*



Inpatient



Prison



Community



Corporate

## Appendix C: Summary of research for recruitment email

[This NHS mental health Trust] is committed to developing Trauma-informed and responsive care as we know that many people experience adverse or traumatic life events. This will affect a significant number of our patients, and may also affect some of our staff as well. Working in trauma-informed ways means that we realise how common trauma is and the impact it has on people. In addition we need to respond to the specific needs of trauma survivors and ensure we do all we can to resist re-traumatising people as a result of the care they receive. There a lot of trauma-informed practice occurring across [the Trust] and a number of teams are receiving training in order to implement this way of working.

To expand and develop this we have an exciting partnership with the University of Bath. This project is inviting Teams across [the Trust] to complete a survey in order to identify how we are currently working in a trauma-informed way and noting areas in which we can improve. We would like to invite team managers (or otherwise someone who has a detailed knowledge of how the team functions) to complete this questionnaire. The questionnaire should take up to 15 minutes. No individual teams will be identified in reports of the results, and the results will be used to develop future training and development opportunities within [the Trust]. *We would be grateful if it could be completed within two weeks (or as soon as possible thereafter) to support this important project.* Here is the

questionnaire: <http://ourspace/StaffServices/AtoE/ClinicalAudit/Surveys/Lists/Trauma%20informed%20organisational%20selfassessment/overview.aspx>

For more information, please see the information sheet attached. If you have any questions, if you are unable to access the questionnaire online (but would like to arrange to complete it over the phone) or would like to receive a report of the results, please contact Marike Fordonnell at [marike.fordonnell1@nhs.net](mailto:marike.fordonnell1@nhs.net) or Chris Gillmore (Trust Lead for Trauma-Informed Care) at [chris.gillmore@nhs.net](mailto:chris.gillmore@nhs.net).

Appendix D: Question and frequency of response table

Questions	Strongly disagree	Disagree	Agree	Strongly Agree	Don't know	N/A to my role
<b>1. Supporting Staff Development</b>						
<b>1A. Training and education</b>						
<b>Staff at all levels of the team receive training and education on the following topics:</b>						
1. What traumatic stress is	2 (9%)	10 (44%)	7 (30%)	4 (17%)	0 (0%)	0 (0%)
2. How traumatic stress affects the brain and body.	1 (4%)	12 (52%)	7 (30%)	3 (13%)	0 (0%)	0 (0%)
3. The relationship between mental health and trauma	1 (4%)	7 (30%)	10 (44%)	5 (22%)	0 (0%)	0 (0%)
4. The relationship between substance use and trauma.	2 (9%)	6 (26%)	13 (57%)	2 (9%)	0 (0%)	0 (0%)
5. The relationship between homelessness and trauma	2 (9%)	10 (44%)	8 (35%)	2 (9%)	1 (4.3%)	0 (0%)
6. How trauma affects a child's development.	2 (9%)	10 (44%)	6 (26%)	5 (22%)	0 (0%)	0 (0%)
7. How trauma affects a child's attachment to his/her caregiver	2 (9%)	10 (44%)	8 (35%)	3 (13%)	0 (0%)	0 (0%)
8. The relationship between childhood trauma and adult re-victimization (e.g., domestic violence, sexual assault).	2 (9%)	6 (26%)	13 (57%)	2 (9%)	0 (0%)	0 (0%)
9. Different cultures (e.g., different cultural practices, beliefs, rituals).	6 (26%)	8 (35%)	8 (35%)	1 (4.3%)	0 (0%)	0 (0%)
10. Cultural differences in how people understand and respond to trauma.	6 (26%)	8 (35%)	9 (39%)	0 (0%)	0 (0%)	0 (0%)
11. How working with trauma survivors impacts staff.	5 (22%)	5 (22%)	11 (48%)	2 (9%)	0 (0%)	0 (0%)
12. How to help service users identify triggers (i.e., reminders of dangerous or frightening things that have happened in the past).	4 (17%)	5 (22%)	10 (44%)	4 (17%)	0 (0%)	0 (0%)
13. How to help service users manage their feelings (e.g., helplessness, rage, sadness, terror, etc.).	1 (4%)	7 (30%)	9 (39%)	6 (26%)	0 (0%)	0 (0%)
14. De-escalation strategies (i.e., ways to help people to calm down before reaching the point of crisis).	1 (4%)	4 (17%)	12 (52%)	6 (26%)	0 (0%)	0 (0%)
15. How to develop safety and crisis prevention plans.	0 (0%)	5 (22%)	12 (52%)	6 (26%)	0 (0%)	0 (0%)

16. What is asked in the intake assessment.	2 (9%)	7 (30%)	12 (52%)	1 (4%)	1 (4%)	0 (0%)
17. How to establish and maintain healthy professional boundaries.	1 (4%)	6 (26%)	13 (57%)	3 (13%)	0 (0%)	0 (0%)
<b>1B. Staff supervision, support and self-care</b>						
18. Staff members have regular team meetings.	1 (4%)	7 (30%)	15 (65%)	3 (13%)	0 (0%)	0 (0%)
19. Topics related to trauma are addressed in team meetings.	0 (0%)	7 (30%)	10 (44%)	6 (26%)	0 (0%)	0 (0%)
20. Topics related to self-care are addressed in team meetings (e.g., vicarious trauma, burn-out, stress-reducing strategies).	2 (9%)	3 (13%)	14 (61%)	4 (17%)	0 (0%)	0 (0%)
21. Staff members have a regularly scheduled time for individual supervision.	0 (0%)	1 (4%)	9 (39%)	13 (57%)	0 (0%)	0 (0%)
22. Staff members receive individual supervision from a supervisor who is trained in understanding trauma.	2 (9%)	12 (52%)	5 (22%)	3 (13%)	1 (4%)	0 (0%)
23. Part of supervision time is used to help staff members understand their own stress reactions.	2 (9%)	6 (26%)	10 (44%)	5 (22%)	0 (0%)	0 (0%)
24. Part of supervision time is used to help staff members understand how their stress reactions impact their work with service users.	1 (4%)	5 (22%)	11 (48%)	5 (22%)	1 (4%)	0 (0%)
25. The team helps staff members debrief after a crisis.	0 (0%)	1 (4%)	11 (48%)	11 (48%)	0 (0%)	0 (0%)
26. The team has a formal system for reviewing staff performance.	0 (0%)	1 (4%)	11 (48%)	9 (39%)	2 (9%)	0 (0%)
27. The team provides opportunities for on-going staff evaluation of the team.	0 (0%)	5 (22%)	12 (52%)	4 (17%)	2 (9%)	0 (0%)
28. The team provides opportunities for staff input into team practices.	0 (0%)	1 (4%)	16 (70%)	6 (26%)	0 (0%)	0 (0%)
29. Outside consultants with expertise in trauma provide on-going education and consultation.	9 (39%)	8 (35%)	3 (13%)	3 (13%)	0 (0%)	0 (0%)
<b>2. Creating a Safe and Supportive Physical Environment</b>						
<b>2A. Establishing a safe physical environment</b>						
30. The team facility has a security system (i.e., alarm system).	0 (0%)	1 (4%)	8 (35%)	14 (61%)	0 (0%)	0 (0%)
31. Team staff monitor who is coming in and out of the team.	0 (0%)	2 (9%)	7 (30%)	13 (57%)	0 (0%)	1 (4%)
32. Staff members ask service users for their definitions of physical safety.	3 (13%)	6 (26%)	11 (48%)	0 (0%)	2 (9%)	1 (4%)
33. The environment outside the team is well lit.	0 (0%)	9 (39%)	11 (48%)	2 (9%)	0 (0%)	1 (4%)
34. The common areas within the team are well lit.	1 (4%)	1 (4%)	15 (65%)	5 (22%)	0 (0%)	1 (4%)
35. Bathrooms are well lit.	1 (4%)	1 (4%)	13 (57%)	3 (13%)	0 (0%)	5 (22%)

36. Service users can lock bathroom doors.	1 (4%)	0 (0%)	7 (30%)	5 (22%)	0 (0%)	10 (44%)
37. Service users have access to private, locked spaces for their belongings.	4 (17%)	2 (9%)	3 (13%)	2 (9%)	0 (0%)	12 (52%)
38. The Team incorporates child-friendly decorations and materials.	2 (9%)	3 (13%)	1 (4%)	3 (13%)	0 (0%)	14 (61%)
39. The Team provides a space for children to play.	4 (17%)	2 (9%)	3 (13%)	1 (4%)	0 (0%)	13 (57%)
40. The Team provides service users with opportunities to make suggestions about ways to improve/change the physical space.	3 (13%)	4 (17%)	7 (30%)	4 (17%)	0 (0%)	13 (57%)
<b>2B. Establishing a supportive environment</b>						
<b>2Bi. Information sharing</b>						
41. The Team reviews rules, rights and grievance procedures with service users regularly.	0 (0%)	8 (35%)	8 (35%)	2 (9%)	2 (9%)	3 (13%)
42. Service users are informed about how the Team responds to personal crises (e.g., suicidal statements, violent behaviour).	1 (4%)	3 (13%)	9 (39%)	4 (17%)	1 (4%)	5 (22%)
43. Service users are informed about who will be checking on them and their spaces (e.g., how often and why it is important).	0 (0%)	3 (13%)	6 (26%)	4 (17%)	0 (0%)	13 (57%)
44. Expectations about room/apartment checks are clearly written and verbalized to service users.	0 (0%)	2 (9%)	4 (17%)	1 (4%)	2 (9%)	14 (61%)
45. Service user rights are posted in places that are visible.	0 (0%)	3 (13%)	12 (52%)	0 (0%)	1 (4%)	7 (30%)
46. Material is posted about traumatic stress (e.g., what it is, how it impacts people, and available trauma-specific resources).	4 (17%)	11 (48%)	5 (22%)	0 (0%)	1 (4%)	2 (9%)
<b>2bii. Cultural competence</b>						
47. Team information is available in different languages.	1 (4%)	8 (35%)	10 (44%)	1 (4%)	2 (9%)	1 (4%)
48. Service users are allowed to speak their native language within the program.	1 (4%)	3 (13%)	13 (57%)	4 (17%)	1 (4%)	1 (4%)
49. Service users are allowed to prepare or have ethnic-specific foods.	0 (0%)	2 (9%)	4 (17%)	3 (13%)	0 (0%)	14 (61%)
50. Staff shows acceptance for personal religious or spiritual practices.	0 (0%)	0 (0%)	12 (52%)	9 (39%)	1 (4%)	1 (4%)
51. Team provides on-going opportunities for service users to share their cultures with each other (e.g., potlucks, culture nights, incorporating different types of art and music, etc.).	2 (9%)	5 (22%)	4 (17%)	2 (9%)	0 (0%)	10 (44%)

52. Outside agencies with expertise in cultural competence provide on-going training and consultation.	4 (17%)	11 (48%)	4 (17%)	1 (4%)	0 (0%)	3 (13%)
<b>2Biii. Privacy and confidentiality</b>						
53. The Team informs service users about the extent and limits of privacy and confidentiality (e.g., the kinds of records that are kept, where they are kept, who has access to this information, and when the program is obligated to report information to child welfare or police).	0 (0%)	1 (4%)	12 (52%)	10 (44%)	0 (0%)	0 (0%)
54. Service users are asked about the least intrusive ways for staff to check on them and their spaces.	0 (0%)	4 (17%)	8 (35%)	0 (0%)	0 (0%)	11 (48%)
55. The Team gives notice prior to doing room/apartment checks.	0 (0%)	1 (4%)	5 (22%)	2 (9%)	0 (0%)	15 (65%)
56. The Team gets permission from service users prior to giving a tour of their room/apartment.	0 (0%)	1 (4%)	3 (13%)	5 (22%)	0 (0%)	14 (61%)
57. If permission is given, the service user is notified of the date, time and who will see their room/apartment.	0 (0%)	1 (4%)	4 (17%)	4 (17%)	0 (0%)	14 (61%)
58. Staff does not talk about service users in common spaces.	0 (0%)	3 (13%)	8 (35%)	9 (39%)	0 (0%)	3 (13%)
59. Staff does not talk about service users outside of the Team.	0 (0%)	1 (4%)	11 (48%)	10 (44%)	1 (4%)	0 (0%)
60. Staff does not discuss the personal issues of one service user with another service user.	0 (0%)	0 (0%)	2 (9%)	20 (87%)	0 (0%)	1 (4%)
61. Service users who have violated rules are approached in private.	0 (0%)	0 (0%)	6 (26%)	9 (39%)	0 (0%)	8 (35%)
62. There are private spaces for staff and service users to discuss personal issues.	2 (9%)	1 (4%)	9 (39%)	9 (39%)	0 (0%)	2 (9%)
<b>2Biv. Safety and crisis prevention planning</b>						
<i>For the following items, the term "safety plan" is defined as a plan for what a service user and staff members will do if the service user feels threatened by another person outside of the service/team.</i>						
63. Service users work with staff to create written, individualized safety plans for their family.	1 (4%)	3 (13%)	11 (48%)	6 (26%)	1 (4%)	1 (4%)
64. Written safety plans are incorporated into service users' individual goals and plans.	0 (0%)	0 (0%)	14 (61%)	8 (35%)	0 (0%)	1 (4%)
<i>For the following items, the term "crisis-prevention plan" is defined as an individualized plan for how to help each service user manage stress and feel supported.</i>						

65. Every adult in the program has a written crisis-prevention plan.	0 (0%)	3 (13%)	11 (48)	4 (17%)	0 (0%)	5 (22%)
66. Every child in the program has a written crisis-prevention plan. Written crisis prevention plans include the following:	1 (4%)	1 (4%)	3 (13%)	1 4(%)	0 (0%)	17 (74%)
67. A list of triggers (i.e., situations that are stressful or overwhelming and remind the service user of past traumatic experiences).	2 (9%)	3 (13%)	11 (48%)	6 (26%)	1 (4%)	0 (0%)
68. A list of ways that the service user shows that they are stressed or overwhelmed (e.g., types of behaviours, ways of responding, etc.).	1 (4%)	3 (13%)	12 (52%)	6 (26%)	1 (4%)	0 (0%)
69. Specific strategies and responses that are helpful when the service user is feeling upset or overwhelmed.	1 (4%)	1 (4%)	14 (61%)	7 (30%)	0 (0%)	0 (0%)
70. Specific strategies and responses that are not helpful when the service user is feeling upset or overwhelmed.	1 (4%)	2 (9%)	15 (65%)	4 (17%)	0 (0%)	0 (0%)
71. A list of people that the service user feels safe around and can go to for support.	1 (4%)	1 (4%)	17 (74%)	4 (17%)	0 (0%)	0 (0%)
<b>2bv. Open and respectful communication</b>						
72. Staff members ask service users for their definitions of emotional safety.	2 (9%)	5 (22%)	12 (52%)	1 (4%)	0 (0%)	0 (0%)
73. Staff members practice motivational interviewing techniques with service users (e.g., open-ended questions, affirmations, and reflective listening).	0 (0%)	0 (0%)	15 (65%)	7 (30%)	0 (0%)	1 (4%)
74. The Team uses “people-first” language rather than labels (e.g., “people who are experiencing homelessness” rather than “homeless people”).	0 (0%)	1 (4%)	15 (65%)	5 (22%)	2 (9%)	0 (0%)
75. Staff uses descriptive language rather than characterizing terms to describe service users (e.g., describing a person as “having a hard time getting her needs met” rather than “attention-seeking”).	0 (0%)	2 (9%)	15 (65%)	6 (26%)	0 (0%)	0 (0%)
<b>2bvi. Consistency and predictability</b>						
76. The Team has regularly scheduled community meetings for service users.	1 (4%)	4 (17%)	4 (17%)	7 (30%)	1 (4%)	6 (26%)
77. The Team provides advanced notice of any changes in the daily or weekly schedule.	0 (0%)	3 (13%)	10 (44%)	3 (13%)	0 (0%)	7 (30%)
78. Team staff responds consistently to service users (e.g., consistency across shifts and roles).	0 (0%)	3 (13%)	17 (74%)	1 (4%)	0 (0%)	2 (9%)

79. There are structures in place to support staff consistency with service users (e.g., trainings, staff meetings, shift change meetings, and peer supervision).	1 (4%)	4 (17%)	12 (52%)	4 (17%)	0 (0%)	2 (9%)
80. The Team is flexible with rules if needed, based on individual circumstances.	0 (0%)	1 (4%)	17 (74%)	4 (17%)	0 (0%)	1 (4%)
<b>3. Assessing and Planning Services</b>						
<b>3A. Conducting intake assessments</b>						
<i>The intake assessment includes questions about:</i>						
81. Personal strengths.	0 (0%)	1 (4%)	17 (74%)	4 (17%)	0 (0%)	1 (4%)
82. Cultural background.	0 (0%)	2 (9%)	17 (74%)	3 (13%)	0 (0%)	1 (4%)
83. Cultural strengths (e.g., world view, role of spirituality, cultural connections).	1 (4%)	3 (13%)	17 (74%)	1 (4%)	0 (0%)	1 (4%)
84. Social supports in the family and the community.	0 (0%)	0 (0%)	17 (74%)	5 (22%)	0 (0%)	1 (4%)
85. Current level of danger from other people (e.g., restraining orders, history of domestic violence, threats from others).	0 (0%)	0 (0%)	15 (65%)	7 (30%)	0 (0%)	1 (4%)
86. History of trauma (e.g., physical, emotional or sexual abuse, neglect, loss, domestic/community violence, combat, past homelessness).	0 (0%)	1 (4%)	15 (65%)	6 (26%)	0 (0%)	1 (4%)
87. Previous head injury.	0 (0%)	9 (39%)	8 (35%)	2 (9%)	3 (13%)	1 (4%)
88. Quality of relationship with child or children (i.e., caregiver/child attachment).	0 (0%)	2 (9%)	14 (44%)	4 (17%)	0 (0%)	3 (13%)
89. Children's trauma exposure (e.g., neglect, abuse, exposure to violence).	0 (0%)	0 (0%)	10 (44%)	4 (17%)	0 (0%)	9 (39%)
90. Children's achievement of developmental tasks.	1 (4%)	0 (0%)	7 (30%)	3 (13%)	0 (0%)	12 (52%)
91. Children's history of mental health issues.	1 (4%)	0 (0%)	8 (35%)	2 (9%)	0 (0%)	12 (52%)
92. Children's history of physical health issues.	1 (4%)	1 (4%)	7 (30%)	2 (9%)	0 (0%)	12 (52%)
93. Children's history of prior experiences of homelessness.	1 (4%)	1 (4%)	6 (26%)	1 (4%)	1 (4%)	13 (57%)
94. There are private, confidential spaces available to conduct intake assessments.	2 (9%)	1 (4%)	12 (52%)	6 (26%)	0 (0%)	2 (9%)
95. The Team informs service users about why questions are being asked.	0 (0%)	0 (0%)	16 (70%)	5 (22%)	1 (4%)	0 (0%)
96. The Team informs service users about what will be shared with others and why.	0 (0%)	0 (0%)	13 (57%)	9 (39%)	0 (0%)	1 (4%)
97. Throughout the assessment process, the Team checks in with service users about how they are doing (e.g., asking if they would like a break, water, etc.).	0 (0%)	2 (9%)	15 (65%)	5 (22%)	0 (0%)	1 (4%)
98. The Team provides an adult translator (not another service user in the program) for the assessment process if needed.	0 (0%)	0 (0%)	15 (65%)	5 (22%)	1 (4%)	2 (9%)



99. Based on the intake assessment, adults are referred for specific services as necessary.	0 (0%)	0 (0%)	13 (57%)	7 (30%)	0 (0%)	3 (13%)
100. Based on the intake assessment, children are referred for further assessment and services as needed.	0 (0%)	0 (0%)	6 (26%)	3 (13%)	0 (0%)	14 (61%)
101. The intake assessment is updated on an on-going basis.	0 (0%)	3 (13%)	13(57%)	3(13%)	0 (0%)	4 (17%)
102. The Team updates releases and consent forms whenever it is necessary to speak with a new Team (external agency?)	0 (0%)	4 (17%)	13 (57%)	3 (13%)	2 (9%)	1 (4%)
<b>3B. Developing goals and plans</b>						
103. Staff supports service users in setting their own goals.	0 (0%)	0 (0%)	14 (61%)	9 (39%)	0 (0%)	0 (0%)
104. Service user goals are reviewed and updated regularly.	0 (0%)	1 (4%)	14 (61%)	6 (26%)	0 (0%)	2 (9%)
105. Service users work with staff to identify a plan to address their children’s needs.	0 (0%)	1 (4%)	5 (22%)	4 (17%)	0 (0%)	13 (57%)
106. Before leaving the Team, service users and staff develop a plan to address potential safety issues.	0 (0%)	2 (9%)	15 (65%)	5 (22%)	0 (0%)	1 (4%)
107. Before leaving the Team, service users and staff develop a plan to address future service needs related to trauma.	1 (4%)	4 (17%)	15 (65%)	2 (9%)	0 (0%)	1 (4%)
108. Before leaving the Team, service users and staff develop a plan that addresses their children’s service needs related to trauma.	1 (4%)	2 (9%)	4 (17%)	1 (4%)	1 (4%)	14 (61%)
<b>3C. Offering services and trauma-specific interventions</b>						
109. The Team provides opportunities for service users to receive a variety of services (e.g., housing, employment, legal and educational advocacy, and health, mental health and substance abuse services).	0 (0%)	2 (9%)	13 (57%)	7 (30%)	0 (0%)	1 (4%)
110. When mental health services are needed (e.g., individual therapy, group therapy and/or family therapy), the Team refers adults to Teams with expertise in trauma.	0 (0%)	3 (13%)	15 (65%)	2 (9%)	0 (0%)	3 (13%)
111. When mental health services are needed (e.g., individual therapy, group therapy and/or family therapy), the Team refers children to Teams with expertise in trauma.	0 (0%)	0 (0%)	10 (44%)	2 (9%)	1 (4%)	10 (44%)

112. The Team coordinates on-going communication between mental health and substance abuse providers.	0 (0%)	2 (9%)	15 (65%)	4 (17%)	2 (9%)	0 (0%)
113. The Team coordinates on-going communication between early intervention and mental health service providers.	0 (0%)	1 (4%)	12 (52%)	8 (35%)	0 (0%)	2 (9%)
114. The Team educates service users about traumatic stress and triggers.	0 (0%)	5 (22%)	13 (57%)	5 (22%)	0 (0%)	0 (0%)
115. The Team provides opportunities for service users to express themselves in creative and nonverbal ways (e.g., art, theatre, dance, movement, music).	0 (0%)	7 (30%)	9 (39%)	4 (17%)	0 (0%)	3 (13%)
116. The Team has access to a clinician with expertise in trauma and trauma-related interventions (on-staff or available for regular consultation).	3 (13%)	2 (9%)	10 (44%)	8 (35%)	0 (0%)	0 (0%)
<b>4. Involving Service Users.</b>						
<b>4A. Involving current service users</b>						
117. The needs and concerns of current (removed provider) service users are addressed in community meetings.	0 (0%)	4 (17%)	5 (22%)	6 (26%)	1 (4%)	7 (30%)
118. The Team provides opportunities for service users to lead community meetings.	3 (13%)	4 (17%)	4 (17%)	3 (13%)	1 (4%)	8 (35%)
119. Current service users are involved in the development of Team activities.	3 (13%)	6 (26%)	6 (26%)	2 (9%)	0 (0%)	6 (26%)
120. Current service users are given opportunities to evaluate the Team and offer their suggestions for improvement in anonymous and/or confidential ways (e.g., suggestion boxes, regular satisfaction surveys, meetings focused on necessary improvements, etc.).	1 (4%)	5 (22%)	11 (48%)	3 (13%)	0 (0%)	3 (13%)
<b>4B. Involving former service users</b>						
121. Former service users are hired at all levels of the program.	3 (13%)	7 (30%)	6 (26%)	1 (4%)	3 (13%)	3 (13%)
122. The Team recruits former service users for their board of directors.	3 (13%)	4 (17%)	5 (22%)	0 (0%)	3 (13%)	8 (35%)
123. Former service users are involved in Team development.	2 (9%)	7 (30%)	8 (35%)	1 (4%)	1 (4%)	4 (17%)
124. Former service users are involved in providing services (e.g., peer-run support groups, educational, and therapeutic groups.).	0 (0%)	7 (30%)	8 (35%)	2 (9%)	2 (9%)	4 (17%)
125. Former service users are invited to share their thoughts, ideas, and experiences with the Team.	1 (4%)	5 (22%)	11 (47%)	3 (13%)	1 (4%)	2 (9%)

<b>5. Adapting Policies</b>						
<b>5A. Creating written policies</b>						
126. The Trust has a written statement that includes a commitment to understanding trauma and engaging in trauma-sensitive practices.	0 (0%)	1 (4%)	10 (44%)	1 (4%)	10 (44%)	1 (4%)
127. Written policies are established based on an understanding of the impact of trauma on service users.	0 (0%)	6 (26%)	6 (26%)	(%)	9 (39%)	2 (9%)
128. The Trust has a written commitment to demonstrating respect for cultural differences and practices.	0 (0%)	0 (0%)	16 (70%)	4 (17%)	3 (13%)	0 (0%)
129. The Trust has a written commitment to hire staff who have experienced mental health difficulties	0 (0%)	0 (0%)	11 (48%)	3 (13%)	8 (35%)	1 (4%)
130. The Trust has a written policy to address potential threats to service users from persons outside of the program.	0 (0%)	0 (0%)	14 (61%)	0 (0%)	9 (39%)	0 (0%)
131. The Trust has a written policy outlining program responses to service user crises (e.g., self-harm, suicidal thinking, aggression towards others).	0 (0%)	0 (0%)	21 (91%)	1 (4%)	1 (5%)	0 (0%)
132. The Trust has written policies outlining professional conduct for staff (e.g., boundaries, responses to service users, etc.).	0 (0%)	0 (0%)	14 (61%)	9 (39%)	0 (0%)	0 (0%)
<b>5B. Reviewing policies</b>						
133. The Trust reviews its policies on a regular basis to identify whether they are sensitive to the needs of trauma survivors.	0 (0%)	0 (0%)	10 (44%)	1 (4%)	11 (48%)	1 (4%)
134. The Trust involves staff in its review of policies.	0 (0%)	4 (17%)	9 (39%)	0 (0%)	10 (44%)	0 (0%)
135. The Trust involves service users in its review of policies.	0 (0%)	1 (4%)	8 (35%)	9 (39%)	13 (57%)	1 (4%)

## Appendix E: Lay summary

### *Introduction*

Trauma is defined as being exposed to an extremely horrific event or series of events. Research suggests that mental health staff and service users experience high rates of trauma. Some aspects of the environment or of situations may intensely remind people of their trauma, an undesirable outcome known as re-traumatisation. To promote safety and trust, and prevent re-traumatisation in mental health service users and staff, [this Trust] is looking at ways they can provide trauma-informed care.

Trauma-informed care means understanding how trauma can affect people's neurological, biological, psychological and social development. In practice, this means building awareness of trauma in service staff, taking measures to promote safety and trustworthiness in services, providing opportunities for service users to have choice and collaboration in their care, and working with service users to help develop resilience and coping skills. Research is beginning to find that trauma-informed approaches can lead to benefits such as improving service user and staff satisfaction, reducing use of restraint, and reducing unplanned discharges. Early studies indicate that these outcomes take time and investment in trauma-informed care by the service – it is important for staff to have support, time and resources to both learn about and embed trauma-informed care in their existing work. [This Trust] is aiming towards becoming a trauma-informed organisation; this project is part of a multi-year project towards this end. The purpose of this research is to understand how [the Trust] is currently doing with regards to trauma-informed care, and to identify areas of trauma-informed care that the Trust can focus on for future training and development.

### *Method*

Twenty-three team managers or staff with equivalent knowledge completed the survey. Participants were recruited by recruitment emails sent to teams and local groups in the Trust, an advert in the Comms bulletin, and the research team promoting within their local networks. The survey was the Trauma-Informed Organisational Self-Assessment, a 135-item questionnaire on different aspects of trauma-informed care, with two additional free-text boxes with the questions: 'Has your team been actively working towards becoming trauma-informed? If so, how?' and 'Do you have any other comments you would like to add about working with trauma in relation to your service?'. Approval for this study was granted by the Quality Improvement Team at the NHS Trust. Before completing the survey, participants viewed an information sheet with information about the project, and completed a consent form. To preserve anonymity, no individual teams are named in reports.

### *Findings*

Twenty-three out of approximately 150 team managers responded, giving a response rate of 15-18% (the average response rate for research in the Quality Improvement Team is 22%). Responses were provided from every area of the organisation (i.e., CAMHS, inpatient, community and prisons) and nearly every region. There were not enough responses per area or region to compare them, so results are provided for [the Trust] as a whole.

The results suggest that the 23 team managers or equivalents who responded on average agree (rather than strongly disagree, disagree or strongly agree) that [this Trust] currently provides trauma-informed care. These ratings were similar across categories and sub-categories of trauma-informed

care. Three of the lowest rated areas of trauma-informed care were involving former service users, training and education and reviewing policies. Of the four point scale (1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree), no area of trauma-informed care scored lower than 2.48.

Of the open-text questions, 14/23 team managers/equivalents reported their service was working towards becoming trauma informed, with examples of trauma-informed care including:

- training staff, e.g., attachment training
- offering regular, consistent and reliable appointments
- providing support to trauma survivors to meet basic housing needs
- having meetings to discuss the impact of trauma
- utilising trauma-informed language
- offering therapies specifically targeted towards helping with trauma (e.g., trauma-focused cognitive behavioural therapy)
- offering regular 1:1 catch up time with staff
- following Safewards guidance
- having a trauma-informed care champion within the team.

6/23 reported they were not actively working towards providing trauma-informed care, 1/23 responded unsure, and 2/23 did not respond.

When asked if they would like to provide further comments about trauma informed care (TIC), 3/23 reported TIC was important for their service, 3/23 requested training in TIC, 3/23 reported limitations in their service environment to being able to provide TIC, 3/23 reported limitations of the survey, and 5/23 responded with 'no' or 'not applicable'. Limitations of the service environment included time pressure, high levels of crisis, overly noisy spaces that were not always confidential, or partner services not providing trauma informed care. Limitations of the survey included it being too long, and some of the questions being less relevant.

### *Limitations*

- A lower than expected response rate may make it difficult to be sure the results are representative of all team managers in the Trust. It may be that those who completed the survey are more likely to be interested in and actively working towards trauma-informed care than those who did not.
- We don't yet have much information about the psychometric properties of the survey – how valid and reliable the survey is in different contexts.
- The survey was long, and progress couldn't be saved part-way – this may have discouraged recruitment.

What this means. On average, the twenty-three team managers or equivalents who completed the survey agree that [this Trust] currently provides trauma-informed care. Areas with lower agreement, that the Trust may like to prioritise for future training and development are: involving former service users, training and education, and reviewing policies.

# Main Research Project Appendices

## Appendix A: Ethical Approval



Research Governance and Compliance

Vice-Chancellor's Office

University of Bath

Bath BA2 7AY

11/08/2023

Dear Marike

**Ethics application reference number:** 0078-609

**Project title:** Does information about health benefits of mindfulness increase mindfulness motivation, intentions and practice? An online randomised control trial.

The above application was considered at the Digital & Data Science Research Ethics Committee Ethics Committee.

Please accept this letter as confirmation that the application has been given a **favourable opinion** on behalf of the committee. This favourable opinion is in place for/until 30/04/2024.

Summary of reviewer comments:

Although a full favourable opinion has been issued, one minor concern was identified in the resubmitted application. The test survey makes mention of PayPal which was removed from the ethics application and does not appear in the payment form either, so to avoid participant confusion or setting an expectation that will not later be met, it is suggested that mention of PayPal is also removed from the actual survey.

You can view the application and comments from the reviewers here: <https://ethics.bath.ac.uk/Project/Index/78>

The documents reviewed and approved at the meeting were:

Document Type	File Name	Date	Version
C2.5 Consent forms	Consent Form	16/05/2023	1
H1 Other documentation	Risk_assessment	19/05/2023	1
H1 Other documentation	Doctoral Data Management Plan	19/05/2023	1
C3.7 Debriefing materials	Debrief	19/05/2023	1
C1.5 Recruitment materials	recruitment poster	04/08/2023	2
H1 Other documentation	Survey questions test survey 4.8.23	04/08/2023	2
C1.7 Participant information sheets	Information sheet	04/08/2023	2
H1 Other documentation	Survey questions payment survey 4.8.23	04/08/2023	2

The project may now commence in line with application documents above.

If there are any changes to this project (including amendments to the design, sample, or start/end dates etc.), you will need to submit an amendment via the online system.

If you have any queries, please contact [data-digital-rec@bath.ac.uk](mailto:data-digital-rec@bath.ac.uk)

Kind regards,

Committee Secretary

On behalf of the Digital & Data Science Research Ethics Committee

## **Mindfulness**

Mindfulness is a meditation practice that comes from Buddhist traditions, and can involve awareness and acceptance of thoughts, feelings, sounds, the breath and bodily sensations occurring in the present moment. Research suggests that many people find mindfulness helpful for their mental health.

Benefits of mindfulness for mental health may include:

- Reduced stress
- Reduced anxiety
- Reduced symptoms of depression
- Improved emotion regulation
- Improved wellbeing and quality of life

Early research suggests mindfulness may also be linked with physical health benefits. Physical health benefits of mindfulness may include:

- Improvements in insomnia
- Improvements in irritable bowel syndrome
- Reduction in pain, tinnitus and somatisation disorders
- Improving stress related disease outcomes (e.g., colds, IBS, Type-II diabetes)

## **Mindfulness in university students**

University students report finding mindfulness helpful. Here, a University of Bath student shares their perspective of mindfulness training:

"Participating in a 5 week mindfulness course at the University of Bath, Mindfulness for Life, was the first step in a transformative experience for me. Before taking this course, I had heard about mindfulness but never fully understood its potential benefits. The small group of us were taken through guided meditation and taught practical exercises, enabling me to learn to be more present in the moment, causing an impactful effect on various aspects of my life.

One noticeable change for me is the improvement in my ability to manage stress and anxiety. The mindfulness techniques taught in



this course, for me specifically grounding techniques, provided me with effective tools to navigate stressful situations with greater calmness and clarity. I find myself less overwhelmed by academic pressures and everyday life stressors."

### **Benefits of brief mindfulness**

Research indicates that many people experience benefits from mindfulness after only one session, and with interventions as brief as five minutes. A review of the available evidence has found that brief mindfulness practice (from 5-20 minutes duration) in a single session, can reduce negative mood and anxiety, reduce anger and sadness, lower distress and heart rate, and improve attention and memory.

## Appendix C: Recruitment Materials

### Online Mindfulness Study

Psychology ethics code: 0078-609 Study end date: 01/05/2024

#### What do I do?

- Listen to a mindfulness audio
- Complete an online questionnaire (whole study ~20 mins)

#### Why take part?

- Be paid £5 (bank transfer)

#### Am I eligible?

University of Bath students, 18+ years who have not completed a 4+ week mindfulness course can take part.



Or visit:

<https://uniofbath.questionpro.eu/mindfulness>

For any questions, or further information, please contact Marike Fordonnell at [msod20@bath.ac.uk](mailto:msod20@bath.ac.uk)



**Take part in our online mindfulness study and get paid £5**

Listen to a mindfulness audio and complete an online questionnaire - the study takes around 20 minutes!



- Am I eligible?
- 18 years old or over
- University of Bath student
- Have not completed a 4+ week mindfulness course

Scan the QR code or email [msod20@bath.ac.uk](mailto:msod20@bath.ac.uk) to find out more



## Information sheet

### **Who am I?**

The primary researcher involved in this project is Ms Marike Fordonnell. She is a Doctorate of Clinical Psychology student in the Department of Psychology. She is conducting an online study to understand early experiences of mindfulness practice and attitudes, beliefs and intentions towards mindfulness. This research is funded by the University of Bath.

### **What is this study about?**

In this study you will be asked to listen to a 10-minute guided mindfulness practice. You will then be asked to complete a brief questionnaire about your attitudes towards mindfulness, and motivation and intentions towards mindfulness. Lastly, there will be a section with demographic information and an option to complete another brief practice. Demographic information will include age, gender and education, however whilst this information would be useful for our research, you do not have to complete any question you feel uncomfortable with.

### **Do I have to take part?**

Taking part in this research is entirely voluntary, and you are free to make your own choice about whether you want to participate. If you agree to take part you can choose not to answer any questions that you do not want to and you are free to withdraw at any time.

### **Will my taking part in this research be kept confidential?**

All survey response data will be anonymous, with no personally identifying information. At the end of the survey you will be auto-redirected to a new page where you can provide details to be paid via bank transfer. This means that your survey responses will be stored separately from and not linked to any payment details. Any payment detail information will be deleted as soon as payment is completed. Note that you are free to withdraw from the study at any time, without having to give a reason. As the data

is anonymous from the point it is submitted, data cannot be withdrawn after this point. The data will be used to publish a research study. Apart from this publication, only researchers directly involved in the study will have access to the data.

### **What may happen to my data?**

Any personal data you provide (i.e., bank details for bank transfer) will be collected via a separate survey page (therefore, not linked to your survey responses) and deleted as soon as payment is complete. Therefore, the survey data collected from you will be anonymous, with no identifying information. As such, it will not be possible to identify you by name or any other identifying information in any aspect of the data, documentation or reporting from the research study. At the end of the study your anonymised data may be made "openly available". This means that it will be published in an online data repository so that it is discoverable and publicly available.

### **What is data publication?**

Publication of research data means that data are made available, free of charge to anyone interested in the research, or who wishes to conduct their own analysis of the data. We will therefore have no control over how these data are re-used after the end of the study. However, all data collected will be anonymous and therefore there will be no way to identify you from the research data.

### **Why data publication?**

Publication of research findings and research data in an open format is considered best scientific practice and is a requirement of many funding bodies and scientific journals. As a large proportion of research is publicly funded, the outcomes of the research should be made publicly available. Sharing data allows findings to be tested, to ensure integrity in the research. It also helps to maximise the impact of investment through wider use, encouraging new avenues of research and maximizing the benefit to society.

**What do I do if I would like to take part or have any more questions?**

You can contact me, Marike Fordonnell to arrange a suitable time or to discuss any questions you might have. Email – [msod20@bath.ac.uk](mailto:msod20@bath.ac.uk) Our address is: Department of Psychology University of Bath Claverton Down Bath, BA2 7AY

## Debrief

### **Debrief: Mindfulness audio and questionnaire study**

Thank you for participating in our questionnaire! The study has now ended. Thank you for taking part in this research study; your participation is highly appreciated. I would like to take some time to provide more details regarding this study.

**Background and aims:** Mindfulness is a meditation practice that comes from Buddhist traditions, and can involve awareness and acceptance of thoughts, feelings, sounds, the breath and bodily sensations occurring in the present moment. Research suggests that many people find mindfulness helpful for their mental health, as it can help to reduce stress, anxiety and depression, and can improve wellbeing. As the benefits of mindfulness are increasingly well understood, research is now moving towards helping more people to access mindfulness, with development of apps and online mindfulness interventions.

To do this, it is important to understand what factors may encourage or discourage people when they are learning to practice mindfulness. One idea is that presenting information to people about health benefits of mindfulness could increase initial motivation when learning, leading to more practice, thereby assisting learning. Alternatively, information about health benefits could be experienced as intrusive, distracting or as setting overly high expectations when someone is just starting to learn.

The main aim of this study was to investigate whether providing information about the health benefits of mindfulness increases

mindfulness practice (measured by how long participants listen to the audio, and whether they choose to participate in further practice), and influences attitudes, beliefs and intentions towards mindfulness.

You will have been allocated to one of two conditions:

- 1) Information about health benefits of mindfulness + mindfulness audio
- 2) Mindfulness audio only

And then completed questions about attitudes, beliefs and intentions towards mindfulness.

**Useful readings:** If you are interested in practicing more mindfulness, the resources below may be useful sources of information and guided practices:

[Insight Timer - #1 Free Meditation App for Sleep, Relax & More](#)

[Meditation and Sleep Made Simple - Headspace](#)

[Calm - The #1 App for Meditation and Sleep](#)

[Courses and workshops for better mental health \(bath.ac.uk\)](#)

**Results:** The results of this study will potentially be used for publication in a journal article; other than this, the results of the study will be made 'open data', which means that they will be publically available (as part of an initiative to encourage science to be open to the public), however all data will be anonymous: no participants will be able to be identified from their data.

**Payment and further questions:** Payment should be made within 4 weeks (all participants will be paid at the end of the month). If you have any questions or concerns regarding your participation

in this study (including payment queries), please contact the lead researcher Marike Fordonnell at [msod20@bath.ac.uk](mailto:msod20@bath.ac.uk). Or you can contact the university ethics system at [data-digital-rec@bath.ac.uk](mailto:data-digital-rec@bath.ac.uk) citing ethical project number 0078-609. Thank you again for your participation!

**Termination message for those not eligible to participate**

**To take part in this study, participants need to be over 18 years old, and a student at the University of Bath. In addition, as this study is interested in early experiences of mindfulness practice, participants cannot have completed 4+ week mindfulness courses. Your answers indicate that you do not meet one or more of these criteria. If this is a mistake, please feel free to re-start the survey.**

**If you are interested in accessing more mindfulness resources, the resources below may be useful sources of information and guided practices:**

**[Insight Timer - #1 Free Meditation App for Sleep, Relax & More](#)**

**[Meditation and Sleep Made Simple - Headspace](#)**

**[Calm - The #1 App for Meditation and Sleep](#)**

**[Courses and workshops for better mental health \(bath.ac.uk\)](#)**