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To 'be' or not to 'be': The paradox of
engagement in mindfulness-based
interventions

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Thesis submitted for the degree of Doctor of Philosophy

University of Sussex

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Declaration

This thesis has been written in an ‘article format’. Chapters 3 to 6 are discrete articles written in the style of papers appropriate for submitting in peer-reviewed journals.

Chapters 1 and 2 present an overview and methodological considerations of the thesis. The final chapter presents a general discussion on the overall findings of this thesis.

Paper 1 has been written in the style of an article appropriate for publication

The author contributions are as follows: Moitree Banerjee was responsible for all aspects of data collection, analysis and writing of the manuscript. Kate Cavanagh and Clara Strauss were responsible for guidance and providing feedback on data analysis and corrections to the manuscript. Robin Banerjee provided feedback on the manuscript. Moitree Banerjee, Kate Cavanagh and Clara Strauss were collectively responsible for the development of the research.

This paper has been presented as a poster at the PsyPAG Annual Conference, Lancaster, 2013 and as an oral paper at the BABCP conference, Birmingham, 2014, Sussex Mindfulness Conference, Brighton, 2014 and the Mindfulness and Compassion Conference, San Francisco, 2015.

Conference Papers:

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The author contributions are as follows: Moitree Banerjee was responsible for conducting the interviews and initial coding of the data. This study was a part of a larger pilot study conducted at the Sussex Mindfulness Centre. Moitree Banerjee and Clara Strauss were involved in formation of the themes. Kate Cavanagh was responsible for overseeing the data analysis. The manuscript has been written by Moitree Banerjee and feedback has been provided by Kate Cavanagh and Clara Strauss. Cassie Hazell and Jenny Gu were involved in validating the codes. Moitree Banerjee, Kate Cavanagh and Clara Strauss were collectively responsible for the development of the research.

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Paper presented at Mindfulness and Compassion: The Art and Science of Contemplative Practice Annual Conference, San Francisco University.

Paper 4 has been written in article format appropriate for publication. This paper will be submitted for publication following the publication of Paper 3.

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This paper has been presented as an oral paper at the Mindfulness and Compassion Conference, Rome, 2016 and will be presented at the Sussex Mindfulness Centre Conference, Brighton, 2016.

Conference Paper:

Banerjee, M., Cavanagh, K., & Strauss, C. (May 2016) *Barriers to Mindfulness: The role of rumination and worry in predicting disengagement from an online mindfulness-based intervention*. Paper presented at International Conference on Mindfulness, Sapienza University of Rome.

I hereby declare that this thesis has not been, and will not be, submitted in whole or in part to

another University for the award of any other degree.

Signature:

Moitree Banerjee

30th September 2016

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Disclaimer

None of the authors report financial or personal relationships that could inappropriately influence (or bias) their decisions or work on this article.

UNIVERSITY OF SUSSEX

Moitree Banerjee

Thesis submitted for the degree of Doctor of Philosophy

To ‘be’ or not to ‘be’: The paradox of engagement in mindfulness-based interventions

Summary

Mindfulness-based interventions (MBIs) are evidenced to be effective for a range of physical and psychological health problems for the clinical and non-clinical population. However little is known about engagement in MBIs. In order to address this research gap, this thesis begins with a meta-analysis exploring the relative odds of engaging in an MBI intervention in comparison to other active interventions (Paper 1). Although the findings were inconclusive, as most papers included in the meta-analysis reported study dropout data only, a key issue identified in this paper was the lack of a consensual definition on engagement in MBIs. Papers 2 to 4 aim to develop a coherent definition of engagement in MBIs and identify the factors associated with it. Due to the paucity of research in engagement in MBIs this thesis starts with a bottom-up approach exploring qualitatively the experience of engaging in a self-help 8-week MBI (Paper 2). This paper identifies several key hindrances of engagement in MBIs. The most striking of these hindrances is habitual perseveration. This reflects a key contradiction as MBIs are theorised to reduce perseverative habits such as rumination and worry. Paper 3 explores this empirically and supports the paradox of engagement in MBIs that rumination and

worry are barriers of engagement in MBIs. In addition, two facets of engagement in MBIs, physical and psychological, are identified. In order to understand if rumination and worry are hindrances to engagement in any interventions, Paper 4 explores the model of engagement identified in Paper 3 in comparison to an active control condition. In conclusion, this thesis defines engagement in MBIs and identifies some factors associated with engagement. Implications for treatment and future research directions are discussed.

Abbreviations

ACC: Anterior Cingulate Cortex

ACT: Acceptance and Commitment Therapy

ADM: Antidepressant Medicines

AE: Aerobic Exercise

AGFI: adjusted goodness-of-fit index

CAMS: Cognitive and Affective Mindfulness Scale

CBASP: Cognitive Behavioural Analysis System of Psychotherapy

CBGT: Cognitive Behavioural Group Therapy

CBT: Cognitive Behavioural Therapy

CEST: Client Evaluation of Self and Treatment

CFI: comparative fit index

CI: Confidence Interval

CPE: Cognitive Psychological Education

C-REC: Cluster-based Research Ethics Committee

DA: Discourse Analysis

DBT: Dialectical Behavioural Therapy

DSM: Diagnostic and Statistical Manual of Mental Disorders

EEG: Electroencephalogram

FAQ: Frequently Asked Questions

FFMQ: Five Facet Mindfulness Questionnaire

FMI: Freiburg Mindfulness Inventory

GAD: Generalised Anxiety Disorder

GAD: Generalised Anxiety Disorder

GFI: goodness-of-fit index

GT: Grounded Theory

HEP: Health Enhancement Program

IAPT: Improving Access to Psychological Therapies

ICD: International Classification of Diseases and Related Health Problems

IPA: Interpretative Phenomenological Approach

KIMS: Kentucky Inventory of Mindfulness Skills

LCMO: Listening to Classica Music Online

LMO: Learning Mindfulness Online

M: Mean

MAAS: Mindful Attention Awareness Scale

MBCT: Mindfulness-based Cognitive Therapy

MB-EAT: Mindfulness-based Eating Awareness Training

MBI: Mindfulness-based Interventions

MBSH: Mindfulness-based Self-Help

MBSR: Mindfulness-based Stress Reduction

MD: Major Depression

MDD: Major Depressive Disorder

MMB: Mindful Mood Balance

NA: Narrative Analysis

NHS: National Health Service

NICE: National Institute for Health and Care Excellence

OR: Odds Ratio

PBAW: Positive Beliefs about Worry

PBCT: Person-based Cognitive Therapy

PBRs: Positive beliefs about rumination scale

PCT: Pharmacotherapy

PFC: Prefrontal Cortex

PLA: Placebo

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses

PSWQ: Penn State Worry Questionnaire

RCT: Randomised Controlled Trial

RMSEA: root mean square error approximation

RR: Risk Ratio

RRS: Ruminative Responses Subscale

SAD: Social Anxiety Disorder

SD: Standard Deviation

SE: Standard Error

SES: Service Engagement Scale

SME: Stress Management Education

SMQ: Southampton Mindfulness Questionnaire

SPSS: Statistical Package for the Social Sciences

TAU: Treatment as Usual

TER: Treatment Engagement Rating

Chapter 1: Overview

“Mindfulness is the miracle by which we master and restore ourselves. Consider, for example: a magician who cuts his body into many parts and places each part in a different region—hands in the south, arms in the east, legs in the north, and then by some miraculous power lets forth a cry which reassembles whole every part of his body. Mindfulness is like that—it is the miracle which can call back in a flash our dispersed mind and restore it to wholeness so that we can live each minute of life.”

(Hanh 1976, p. 14).

1.1 Introduction

1.1.1 Definition of Mindfulness

Mindfulness is often described as a key element of Buddhist traditions (Hanh, 1987). The term ‘mindfulness’ is derived from the Pali word ‘*sati*’ and ‘*sampajana*’, which could be interpreted as awareness, circumspection, discernment and remembrance (Batchelor, 1997; Shapiro, 2009). The definition of mindfulness within the psychological literature is broadly consistent with the traditional Buddhist conceptualisation (Malinowski, 2008). However, mindfulness in Buddhist scriptures refer to a practice or process and not a mental function (Grossman & Van Dam, 2011) while mindfulness in the psychology literature is often referred to as a process (mindful practice) as well as an outcome (mindful awareness) (Shapiro, 2009).

There are contrasts in the definition of mindfulness in the psychology literature. This distinction has led to the development of different measures of mindfulness that

will be discussed later (see section 1.1.3). Some mindfulness researchers have focussed only on the attentional aspect of mindfulness (e.g., Brown & Ryan, 2003). However, Kabat-Zinn (1994) defined mindfulness as “paying attention in a particular way: on purpose, in the present moment, and non-judgementally”, later revising the definition as “the awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding experience moment by moment” (Kabat-Zinn, 2003 p. 145). Bishop (2004) operationalised Kabat-Zinn’s (2003) definition through consensus of several researchers and clinicians. This definition conceptualized mindfulness as a two-construct model involving a “self-regulation of attention” and adopting a particular orientation toward one’s present moment experiences characterized by curiosity, openness and acceptance (Bishop, 2004; p. 232). Shapiro et al. (2006) added intention as a third component to this definition. Intention has been defined as a dynamic and evolving personal vision to shift along a continuum of self-regulation, from self-exploration leading to self-liberation (Shapiro et al., 2006). However, these models are not accepted by all third-wave approaches, as it is argued that there may be implicit theoretical assumptions that limit its applicability (Hayes & Shenk, 2004). Hayes and Shenk (2004) argue that Bishop’s (2004) model of mindfulness projects mindfulness as a psychological mode as well as a technological method; however, if mindfulness is a psychological mode, then techniques other than mindfulness meditation could aid achieving this mindful mode (see Hayes & Shenk, 2004 p. 250). Although there may not be a consensual comprehensive definition of mindfulness Kabat-Zinn’s (2003) definition is widely accepted (Hayes & Shenk, 2004; Bishop, 2004) as a preliminary definition that is expressed in a language that can be easily understood by researchers and clinicians involved in this field (Chiesa, 2012).

Hence, Kabat-Zinn's (2003) definition of mindfulness has been used throughout this thesis.

1.1.2 Mindfulness: A Trait or a State or both?

Although early Buddhist scriptures refer to mindfulness as a practice or process and not a trait, in Western psychology mindfulness was initially operationalized as a relatively stable mental trait (Grossman & Van Dam, 2011). However, mindfulness is now theorized both as a trait-like quality, with regard to one's mindful predisposition in daily life (e.g., Baer, Smith, Hopkins, Krietemeyer & Toney, 2006) as well as a state-like quality that is achieved through practising mindful meditation (e.g., Lau et al., 2006). Several studies have reported that practising mindfulness meditation or participating in mindfulness-based interventions (MBIs) can increase trait mindfulness (Eberth & Sedlmeier, 2012). Thus repetitive increase in state mindfulness through practise can increase trait mindfulness. This has been supported by neurobiological studies that have shown that repeated activation of the neural networks that represent state mindfulness during meditation lead to reorganisation in the neural networks which would promote increase in trait mindfulness (Garland et al., 2010). A recent study testing the trajectory from state to trait mindfulness supported these findings and reported that increase in state mindfulness over repeated meditation practice leads to increase in trait mindfulness (Kiken, Garland, Bluth, Palsson & Gaylord, 2015).

Trait mindfulness has been associated with several positive mental health attributes. For example, in a student population, trait mindfulness has been evidenced to be associated with higher openness to experience, emotional intelligence and self-compassion (Baer et al., 2006). The positive association of trait mindfulness and self-compassion and positive affect has also been noted in a trainee therapist sample

(Shapiro, Brown & Biegel, 2007). In a non-clinical novice meditator sample, trait mindfulness has been associated with increased working memory and sustained attention, relative to a comparison wait-list control condition (Chambers, Lo & Allen, 2008). Trait mindfulness is also associated with lower levels of maladaptive mental health attributes such as, worry, rumination, thought suppression, experiential avoidance, rumination, absent-mindedness, alexithymia and dissociation (Baer et al., 2006; Chambers, Lo & Allen, 2008; McKee et al., 2007; Feldman et al., 2007). A similar negative association of trait mindfulness and thought suppression and rumination has been reported in a clinical sample (Cardaciotto et al., 2008). In a treatment-seeking student population, trait mindfulness was reported to be associated with decrease in the frequency and perception of difficulty in the “letting-go” of negative thoughts (Frewen et al., 2008). Thus, research evidence a promising association of trait mindfulness with several adaptive mental health attributes. As noted previously, mindfulness can be conceptualised as a trait-like as well as a state-like quality, this thesis explores mindfulness as a trait-like quality.

1.1.3 Facets of Mindfulness and its Measurement

In the psychology literature, there are contrasting theoretical outlooks on whether mindfulness is a single-faceted or a multi-faceted attribute. Mindfulness has been theorized as a single-faceted construct that is mainly characterized by ‘person-centered attention’ (Chiesa, 2012). Within this notion mindfulness is a ‘general tendency to be attentive to and aware of present-moment experience in daily life’ (Baer et al., 2006 p. 28). Psychometric scales such as the Mindful Attention Awareness Scale (MAAS; Brown & Ryan 2003), Freiburg Mindfulness Inventory (FMI; Buchheld et al., 2001), Cognitive and Affective Mindfulness Scale (CAMS) Revised (Kumar et al., 2008) and the Southampton Mindfulness Questionnaire (SMQ; Chadwick et al, 2008) were

developed based on the single-faceted conceptualization of mindfulness. However, based on the original meaning of mindfulness in Buddhist scriptures and the modern definition of mindfulness, other researchers argue that mindfulness is a multi-faceted construct that extends beyond attention/awareness. The Kentucky Inventory of Mindfulness Skills (KIMS; Baer et al, 2004) included four facets - observing, describing, acting with awareness, and accepting without judgment. This was later revised into the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) which characterized mindfulness by non-reactivity, observing, acting with awareness, describing, and non-judging. There is ongoing consideration on the concept of mindfulness and its measurements. Grossman (2008) argues that these psychometric scales were developed with insufficient knowledge of the original concept and experience of mindfulness. Moreover, these psychometric scales of mindfulness often do not correlate with one another (e.g., Baer et al. 2006). Hence, it is crucial for mindfulness researchers to specify the conceptualization, definition and measures of mindfulness being used within their investigations.

1.1.3.1 Research Adopting Single and Multi-Faceted Approach of Mindfulness

Since the introduction of mindfulness in psychotherapy, two distinct lines of research have explored each approaches to mindfulness. Research based on the one-dimensional construct of mindfulness has revealed that MBIs have significant effects in increasing trait mindfulness, empathy and subjective well-being and reducing perceived stress and rumination (Shapiro, Brown, Thoresen & Plante, 2010; Atanes et al., 2015; Shapiro, Oman, Thoresen, Plante & Flinders, 2008). Another study reported that, when measured as a single-faceted construct, mindfulness was associated with less frequent avoidant coping strategies and higher use of approach coping in a sample of college students (Weinstein, Brown & Ryan. 2009). Research on single-faceted mindfulness

extends to the clinical population and reports similar effects. For example, studies have reported significant pre-post reduction in depressive and anxiety symptoms among participants diagnosed with general anxiety disorder (GAD; Evans et al., 2008; Roemer, Orsillo & Salters-Pedneault, 2008). Additionally, single-faceted mindfulness is associated with reduction in pre-post brooding among a sample of recurrently depressed individuals (Shahar et al., 2010).

Researchers have also conceptualised mindfulness as a multi-faceted construct. The most commonly used scale of multi-faceted mindfulness is the FFMQ. One study explored the dimensions of mindfulness and the psychometric properties of its respective measures using two large student samples (Baer et al., 2006). The results revealed that facets of mindfulness were differentially correlated in the expected direction with constructs such as, self-compassion, emotional intelligence, emotional regulation, thought suppression and experiential avoidance. This offers support for the multi-dimensional conceptualization of mindfulness. Hence in this thesis, mindfulness has been conceived as a multi-faceted construct.

Interestingly, although, multi-faceted mindfulness scales such as the FFMQ measures each of the five facets of mindfulness, several studies use these scales to derive a single total mindfulness score (for example, Carmody et al., 2009; McManus et al., 2012; Vøllestad et al., 2011). Recent studies using confirmatory factor analysis have shown support for an overarching construct of mindfulness when measured by the FFMQ (Gu et al., 2016). Scales such as FFMQ have reported satisfactory psychometric properties of the total score of mindfulness (see Bohlmeijer et al., 2011; Baer et al., 2006). Additionally, mindfulness is defined as “the awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the

unfolding experience moment by moment” (Kabat-Zinn, 2003 p. 145). Hence, it may be argued that mindfulness is the sum of all the facets rather than individual discrete facets.

When measured as a total score within a multi-faceted mindfulness scale, mindfulness has shown associations similar to the single-faceted mindfulness construct. For example, multi-faceted mindfulness is positively associated with increased mindfulness, positive state of mind and negatively associated with depression and anxiety in a cross-sectional study among a non-clinical sample (Branstrom, Duncan & Moskowitz, 2011). When measured as a multi-faceted construct, MBIs have shown significant improvement in psychological well-being in comparison to a relaxation training control condition in a randomised controlled trial (Josefsson, Lindwall & Broberg, 2012). When measured as multi-dimensional, in a clinical population of adults with a history of recurrent depression, MBIs resulted in reduction in depressive symptoms and decreased level of rumination and worry in a randomised controlled trial study (van Aalderen et al., 2012). In this thesis mindfulness is therefore considered as a unitary construct and, when measured, the total score from the FFMQ is used in analyses.

1.1.4 Mindfulness in Psychotherapy

“This [Buddhist psychology] is the psychology everybody will be studying twenty-five years from now” – (William James, early 1900’s; cited in Epstein, 1995, pp. 1-2).

Interest in Buddhist approaches has been evident in Western psychology since the turn of the century. However, the influence of Buddhist traditions on modern Western psychology grew in the 1970’s with techniques such as, Zen-based residential therapy, transcendental meditation and relaxation response (Germer, Siegel & Fulton, 2013). Mindfulness specifically was introduced by Jon Kabat-Zinn when he opened the Centre

for Mindfulness in 1979 and developed mindfulness-based stress reduction (MBSR) to treat chronic pain that could not be otherwise treated. The aim of MBSR is to develop a means for people with chronic pain to undertake responsibility of their well-being through cultivating their innate ability to attend to and sense ‘the interconnectedness of apparently separate aspects of experience’ of pain (Kabat-Zinn, 2003 p. 149). MBSR is an 8-week group intervention designed to cultivate of mindfulness or mindful awareness (Grossman, Niemann, Schmidt & Walach, 2004). The weekly sessions last for about 150 minutes, with one additional all-day session. Each session covers themes examined in the context of mindfulness and specific mindfulness exercises. These include mindfulness meditation practice, mindful awareness and mindfulness during stressful situations. The intervention also includes daily 45-min homework assignments mainly as meditation practice, mindful yoga and applying mindfulness to situations in everyday life, since according to this approach the development of mindfulness requires repeated practice (Kabat-Zinn, 1990). A meta-analysis on the health benefits of MBSR revealed a between-group Cohen’s d of approximately 0.5, revealing promising effects of MBSR for a range of mental health outcomes such as, depression and anxiety, in the clinical and non-clinical population (Grossman et al., 2004). These promising results have led to adoption and adaptation of mindfulness techniques for treating other mental health difficulties.

MBCT was originally developed as an intervention for relapse prevention for people with recurrent major depressive disorder (Teasdale et al., 2000). MBCT was originally developed as a relapse prevention tool. Depressive relapse often occurs when a person with a history of depression is unable to undertake suitable coping strategies at an early phase of developing relapse. Mindfulness training aims to help the person develop these strategies by creating awareness of thoughts and feelings. Additionally,

mindfulness training intends to help a person turn towards the difficulties rather than avoiding these, thereby increasing the chances of engaging with cognitive remedial actions (Teasdale, Segal & Williams, 1995). Mindfulness training is also intended to help individuals to decenter from the content of thoughts and thereby learn how to not attach meaning or truth to these thoughts and merely notice them as they come and go (Kabat-Zinn, Lipworth & Burney, 1985). This process should be directly antagonistic to maladaptive cognitive processes such as, rumination, that involves passively becoming absorbed by negative thoughts and emotional states (Deyo et al., 2009), which usually precede mental health problems such as depressive relapse (Teasdale, Segal & Williams, 1995). MBCT (Segal et al, 2002) is very similar to MBSR in terms of duration and structure but supplements mindfulness training with training of specific cognitive skills. Additionally, unlike MBSR, MBCT places more emphasis on short practices, such as, 3-minute breathing space, in order to synthesize mindful attitude. Moreover, psychoeducation about stress is replaced by monitoring and analysing dysfunctional cognitive thinking styles (Mace, 2007). Both MBSR and MBCT protocols unambiguously emphasize the requirement that mindfulness teachers need to have ongoing meditation practice (Baer, 2015), and should embody and enact mindfulness during the treatment course.

Many other interventions also include mindfulness concepts and training. For example, dialectical behaviour therapy (DBT) (Linehan, 1993), acceptance and commitment therapy (ACT) (Hayes, 1994), attentional control therapy (McMillan, Robertson, Brock, & Chorlton, 2002), mindfulness-based eating awareness training (MB-EAT) (Kristeller & Hallett, 1999), mindfulness-based relationship enhancement for couples (Carson, Carson, Gil & Baucom, 2004), intensive mindfulness-based retreats for addictive behaviour (Ostafin et al., 2006; Bowen et al., 2006) and person-

based cognitive therapy (PBCT) (Chadwick, 2006). These interventions incorporate shorter informal exercises rather than the long formal exercises used in MBSR and MBCT (Baer, 2015). DBT takes a didactic approach encompassing mainly the ‘what’ skills of observation, description or participation and the ‘how’ skills of being non-judgemental (Mace, 2007). Acceptance and commitment therapy (ACT; Hayes et al, 1999) incorporates behaviour-change processes as well as acceptance and mindfulness processes (Baer, 2015). Person-Based Cognitive Therapy (PBCT: Chadwick, 2006) incorporates cognitive behavioural therapy for psychosis with mindfulness practice and highlights the importance of acceptance of voice hearing (Dannahy et al., 2011).

1.1.5 Our Definition of Mindfulness-Based Intervention (MBIs)

Although several interventions have incorporated mindfulness techniques and approaches, MBSR and MBCT are considered as the two forms of psychological interventions that are predominantly based on mindfulness (Baer, 2015) and are often considered ‘gold-standard’ interventions. However, adaptations of these interventions have been explored in the literature and have their importance in clinical and public health contexts. Our definition of MBIs would constitute of MBSR and MBCT and any adaptations of these interventions that are primarily based on mindfulness meditation training.

1.1.6 Mindfulness Practices in MBIs

In the 8-weekly 150-minute classes in MBIs, mindfulness is cultivated through formal meditation practices and informal practices to integrate mindfulness principles into everyday life as a mechanism to cope with physical symptoms and difficult emotions (Kabat-Zinn, 1994). According to the protocol of MBSR (Kabat-Zinn 1990) and MBCT (Segal et al, 2002), the informal practices involve doing everyday activities

such as, eating and walking, with mindful awareness of the movements, sensations, cognitions and feelings that may be associated with these activities while the formal mindfulness practices include body scan, sitting meditation, mindful yoga and very brief 3-minute breathing practices. During body scan, participants are guided to focus their attention on their body parts sequentially. Sitting meditation involves anchoring to the sensation of breathing while observing external stimuli and internal physiological and psychological stimuli. Mindful yoga is practiced to cultivate awareness of movements and stretching (see Table 1.1 for an overview of the structure of an 8-week MBCT intervention). Group-based MBIs also include group discussions on the experience of practising mindfulness and the challenges of using mindfulness during stressful situations, and teachers embody and enact mindfulness during the sessions.

Experts in mindfulness have argued that in order to develop meta-cognitive insight into mindfulness, that is the ‘conscious cognitive or affective experience’ of mindfulness rather than the ‘feeling of knowing mindfulness, it is essential to engage with formal practices (Teasdale, 1999; p. 147). A study comparing the effects of formal and informal mindfulness meditation practice reported that only formal practice leads to increase in mindfulness, which in turn, increases well-being and reduces mental health symptoms among individuals with illness-related stress, chronic pain, anxiety and personal or employment-related stress (Carmody & Baer, 2008). Engaging in formal practice is also associated with reduced rumination, which in turn, is associated with symptom alleviation in participants in remission of depressive symptoms (Hawley et al., 2014). A recent study on university students revealed both formal and informal mindfulness practice resulted in increase in mindfulness and self-compassion, however, a comparison of the groups revealed that formal mindfulness practice exhibited significantly greater increases psychological inflexibility, decentering and self-

compassion, compared to the informal practice group (Hindman, Glass, Arnkoff & Maron, 2015). Additionally, another study reported a significant negative association between daily duration of formal home practice and the hazard of relapse to depression. Moreover, the participants who engaged in formal practice at least three days in a week were almost half as likely to relapse (Crane et al., 2014). Conversely, a review reported that the evidence to support the importance of formal home practice is inadequate (Vettese et al., 2009). According to this review, only about half of the studies (N = 11 out of 24) demonstrated support for the benefits of formal practice.

These disparities in the literature raise interesting research questions on the importance of formal practice in developing mindfulness skills. One argument could be that certain populations may be more or less responsive to mindfulness training and hence the importance of formal practice in cultivating mindfulness may vary across these population groups.

Table 1.1: Overview of an 8-week MBCT intervention

Session	Key Topics
Week 1	<p>The mental states of “autopilot” and “mindfulness”</p> <p>First-hand experience of mindfulness: the raisin exercise</p> <p>Mindfulness practice: body scan</p>
Week 2	<p>Relationship between thoughts and emotions</p> <p>Awareness of pleasant events</p> <p>Mindfulness practice: sitting meditation</p>
Week 3	<p>Mindfulness practice: 3-minute breathing space</p> <p>Mindfulness practice: mindful stretching and walking</p>

	Awareness of unpleasant events
Week 4	Automatic thoughts (autopilot) can lead to emotional distress Practice of meditation techniques learned previously
Week 5	Sitting meditation focusing on a difficult or stressful situation
Week 6	Thoughts are not facts Using the 3-minute breathing space in stressful situations
Week 7	Relationships between daily activities and depression Generate list of pleasure/mastery activities Identifying relapse triggers
Week 8	Course review Keeping a long-term meditation practice going

Extracted from Segal ZV, Williams JM, Teasdale JD. Mindfulness-based cognitive therapy for depression: a new approach to preventing relapse. New York: Guilford Press; 2002.

1.2. Effectiveness of Mindfulness-Based Interventions

1.2.1 Effectiveness of MBIs in the clinical population

There is a growing body of literature documenting the effectiveness of MBIs in the clinical population. MBSR was originally developed for chronic physical health conditions, (Kabat-Zinn, 1990). A meta-analysis exploring the evidence of MBSR on chronic conditions such as chronic pain, fibromyalgia and cancer reported large effect sizes of pre-post improvement ($d=0.53$) for a broad range of chronic disorders and problems (Grossman, Niemann, Schmidt & Walach, 2004). Another meta-analysis exploring the effect of MBSR on mental health of adults with a chronic medical disease (i.e. any condition that involves some enduring disability caused by reversible or irreversible pathological change), concluded that MBSR had medium effects ($d = 0.47$) in reducing anxiety and small effects in reducing in depression ($d = 0.26$) and

psychological distress ($d = 0.32$) (Bohlmeijer, Prenger, Taal & Cuijpers, 2010).

Additionally, there is evidence suggesting the beneficial effects of MBSR for the mental health of patients with chronic physical conditions such as cancer ($d = 0.48$) (Ledesma & Kumano, 2008). The variations in the effect size of reduction in symptom severity could be due to the varied effects of MBSR for the different health conditions. MBSR was developed for the treatment of chronic pain (Kabat-Zinn, 2003) and results show large effects in symptom reduction. However, when MBSR is used to treat mental health conditions such as depression, it results in low effects. Hence, the importance of developing distinct treatment models tailored to each mental health condition. One such example of treatment developed from similar mindfulness principles that are tailored for a distinct mental health condition (depression) is MBCT.

MBCT, on the other hand, was designed in order to prevent depressive relapse (Segal et al., 2002). A recent meta-analysis reported that participants with recurrent depression (in full or partial remission) receiving MBCT had a reduced risk of relapse within a 60-week follow-up period (hazard ratio = 0.69) in comparison to those who did not receive MBCT (Kuyken et al., 2016). Additionally, this reduced risk of relapse was also reflected when compared to active control conditions (hazard ratio = 0.79) at 60-week follow-up. This recent review, echoed an earlier meta-analysis also finding that MBCT in adjunct to usual care was significantly better than usual care alone for reducing major depression (MD) relapses in patients with three or more prior depressive episodes (Chiesa & Serretti, 2011). In addition to prevention of relapse, MBCT also increases the time until first relapse in comparison to treatment-as-usual (TAU) (Godfrin & Heeringen, 2010). The mechanisms underlying these promising effects were explored in a qualitative study on participants with a diagnosis of recurrent depression following MBCT (in full or partial remission) (Allen, Bromley, Kuyken & Sonnenberg,

2009). Participants reported to recognize early signs warning signs of relapse, take action that could substitute negative attentional focus and related objectively to depressive thoughts and feelings. These themes are consistent with the original aims of MBCT (see section 1.1.4).

Since the introduction of MBIs in psychotherapy, researchers have started to explore the beneficial effects of these interventions for other physical and mental health conditions. MBIs have been evidenced to be effective interventions in treating a range of physical (Veehof, Trompetter, Bohlmeijer, & Schreurs, 2016; Yang, LiuZhang, & Liu, 2015) and psychological health (Spijkerman, Pots, & Bohlmeijer, 2016; Strauss, Cavanagh, Oliver, & Pettman, 2014) problems. A meta-analysis of studies on anxiety and mood disorder patients revealed a MBIs were associated with effect sizes (Hedges's g) of 0.97 and 0.95 for improving anxiety and mood symptoms, respectively (Hoffmann, Sawyer, Witt & Oh, 2010). However, the results in this meta-analysis were later criticized for being largely based on uncontrolled and non-randomized studies (Nykliček, van Son, & Pouwer, 2010) which might have inflated the effect sizes. This criticism well-founded by the findings of another meta-analysis that revealed much smaller effect of MBSR on depression (Cohen's $d = 0.26$) and psychological distress (Cohen's $d = 0.32$) and medium effect (Cohen's $d = 0.47$) on anxiety symptoms. However, these effect sizes may be conservative values as the meta-analysis grouped together both inactive waitlist and active control conditions (Nykliček, van Son, & Pouwer, 2010).

Despite this variation in the magnitude of reported effects, there is promising evidence supporting the effectiveness of MBIs in improving a range of mental health problems. For example, a recent meta-analysis on MBIs reported a large effect (Hedges $g = -0.73$) in reducing depression symptom severity (Strauss, Cavanagh, Olive & Pettman,

2014). These effects are replicated in anxiety disorders. A randomised controlled trial (RCT) comparing MBSR with a waitlist control condition for participants with heterogeneous anxiety disorders reported significant differences in anxiety outcomes and that mindfulness fully mediated changes in acute anxiety symptoms, and partially mediated changes in worry and trait anxiety (Vollestad, Sivertsen & Nielsen, 2011). MBCT is evidenced in reducing anxiety symptoms in patients with bipolar disorder in remission and in patients with some anxiety disorders (Chiesa & Serretti, 2011). MBIs are also moderately effective interventions (Hedge's $g = 0.52$) for psychosis with greater effects on negative symptoms compared to positive ones.

However, some of these studies can be criticised for not comparing MBIs with active control conditions, not obtaining follow-up data and not measuring therapists' training and experience (Khoury et al., 2013). Studies comparing MBIs with inactive control conditions such as, treatment as usual (TAU), are not able to draw strong conclusions on the effect of MBIs as the between-group differences could be attributed to non-specific factors or placebo effects of participating in a group-based intervention. Since teaching mindfulness requires extensive grounding in mindfulness practice (Kabat-Zinn, 2003), it is crucial for research studies to quantify teachers' experience. One of the most common criticisms of MBI studies is measuring psychological variables only through self-report measures. Self-report measures may be affected by social desirability effects or other response biases in the reporting of symptoms (Vollestad, Sivertsen & Nielsen, 2011). Research has begun on objective biological indicators, such as cortisol levels, of improvement in MBIs (Matousek, Dobkin, & Pruessner, 2010). Another major criticism of previous research on effectiveness of MBIs is using non-active control conditions. These comparisons do not account for effects may be due to non-specific factors, such as receiving attention, being part of a credible treatment program,

universality or group-related factors (Vollestad, Sivertsen & Nielsen, 2011; Strauss, Cavanagh, Olive & Pettman, 2014). This has initiated research into comparable active controls for MBIs (MacCoon et al., 2012). A recent RCT comparing MBCT with Health Enhancement Program (HEP) revealed greater mean percent reduction in depression and significantly higher rate of treatment responders in the MBCT condition (Eisendrath et al., 2016). Another RCT comparing MBCT with Cognitive Behavioural Analysis System of Psychotherapy (CBASP) reported significant reduction of suicidal ideation when assessed through clinician rating in the MBCT and CBASP group, but not in the TAU group while controlling for changes in depression (Forkmann, Brakemeier, Teismann, Schramm & Michalak, 2016). However, the study reported no effects on self-reported suicidal ideation. Although research on the effectiveness of MBIs is promising, more research comparing MBIs with active control conditions are required to understand the comparative magnitude of these positive effects.

1.2.1.1 Inconsistencies in the literature

Despite the promising results from research on MBIs, there several inconsistencies in the findings that urge more rigorous research. For example, meta-analyses have found MBCT with usual care was significantly better than usual care alone for reducing major depression (MD) relapses in patients with three or more prior depressive episodes (Chiesa & Serretti, 2011; Kuyken et al., 2016). However, a recent large, well designed randomized dismantling trial of 274 participants currently remitted from MDD comparing MBCT with cognitive psychological education (CPE) reported no significant effect between groups on risk of relapse to MDD over 12 months' follow-up (Williams et al., 2014). One explanation could be that the positive outcomes of MBCT are a result of psychoeducation, positive effects of the groups and therapists. However, this study also reported no significant between groups difference in risk of

relapse to MDD over 12 months' follow-up when compared with a treatment as usual control (TAU) condition. This study raises significant questions about the effectiveness of MBCT. However, this study did reveal that MBCT had a significant effect on reducing risk of relapse over 60 weeks in comparison to both CPE and TAU for participants who had a history childhood trauma. Additionally, a recent meta-analysis that included the dismantling trial reported that MBCT was more effective than antidepressants at reduce risk of relapse (Kuyken et al., 2016). Hence results from an individual study should interpreted with caution.

Although MBIs have been found to be an effective intervention in comparison to waitlist control conditions, a meta-analysis revealed that these effects of MBIs did not differ from traditional cognitive behavioural therapies (CBT) or behavioural therapies (Hedge's $g = -.07$) or pharmacological treatments (Hedge's $g = .13$) (Khoury et al., 2013). MBIs and CBT have been compared in several other studies reporting comparable effects in reducing symptom severity, improving mood, functionality and quality of life (Arch et al., 2013; Koszycki, Benger, Shlik & Bradwejn, 2007). Similarly, group CBT and MBSR have been reported to have similar effects in significantly reducing social anxiety symptoms (Goldin et al., 2016).

There is some evidence suggesting that MBIs outperformed CBT among participants with moderate to severe depressive symptoms and among those with average anxiety sensitivity at 3-month follow up (Arch & Ayers, 2013). Moreover, an RCT reported that although the effects of CBT and MBIs in reducing depression scores among participants with a diagnosis of major depressive disorder (MDD) was comparable, however, MBIs had a unique role in reducing post-treatment rumination (Manicavasagar, Perich & Parker, 2010). Another RCT reported that MBIs were more effective than anti-depressant medication in preventing relapse (Kuyken et al., 2008).

Hence, to summarise these evidence suggests that MBIs are at least as effective as other active interventions such as CBT and may lead to better psychological health in the long term.

1.2.2 Effectiveness of MBIs in the non-clinical population

The effectiveness of MBIs has also been explored in the non-clinical population. Recent meta-analyses have reported that MBSR is moderately effective in reducing stress, depression, anxiety and distress and in enhancing the quality of life of healthy individuals (Khoury, Sharma, Rush & Fournier, 2015; Chiesa & Seretti, 2009). Another review concluded that MBIs enhanced ability to manage difficult cognitive and emotional experiences, improve well-being and increased psychological functioning in a non-clinical population (Virgili, 2013). A longitudinal study reported that MBSR enhanced self-reported mindfulness, distress tolerance and resilience and was also an effective preventative method to allow more adaptive responses to future stress (Nila, Holt, Ditzen & Aguilar-Raab, 2016). MBCT, on the other hand, has been reported as an effective intervention in helping non-clinical student samples to deal with their anxiety and depressive feelings before, during and after stressful circumstances and reducing negative automatic thoughts and dysfunctional attitudes (Kaviani, Javaheri & Hatami, 2011). Additionally, like MBSR, MBCT increases self-reported mindfulness, reduces negative affect (Collard Avny & Boniwell, 2009) and improves positive affect by reducing the use of disengagement coping styles (Cousin & Crane, 2015).

The benefits of MBIs for specific professional groups have also been explored, for example clinicians and healthcare professionals (Irving, Dobkin & Park, 2009; Khoury et al., 2009). A systematic review of MBSR on healthcare professionals reported that MBSR is associated with improvements in burnout, stress, anxiety and depression (Lamothe, Rondeau, Malboeuf-Hurtubise, Duval & Sultan, 2015). A recent longitudinal

study reported similar findings of the effect of MBSR in increasing mindfulness and meaningfulness and reducing stress and burnout (Dobkin, Bernardi & Bagnis, 2016). Moreover, the beneficial effects of clinicians participating in MBIs are also reflected on the patients these clinicians work with. For example, when clinicians who participated in an MBSR intervention experienced less depersonalization, their patients reported being better understood (Dobkin, et al., 2016). However, one of the hurdles of engagement in MBIs among the healthcare professionals is time commitment (Turner, 2013), often leading to disengagement from longer formal practices. A recent qualitative study reported that healthcare professionals participating in an MBCT intervention associated mindfulness with being able to decenter from strong emotions and feel more grounded, although, some equated this with avoidance (Zoysa, Ruths, Walsh & Hutton, 2014).

Due to hurdles of time commitment, researchers have started exploring the impact of briefer adaptations of MBIs in the non-clinical population. The intensity of MBIs may be appropriate for the clinical population for whom MBIs were originally developed (Kabat-Zinn, 1990; Segal, 2002). However, the non-clinical population could benefit from briefer versions of these interventions. Virgilli (2013), in his review, concludes that for working adults, briefer interventions developed for the workplace are no less effective than full interventions which were developed with a clinical purpose. These briefer adaptations of MBIs have been discussed later (see section 1.3).

1.2.2.1 Limitations of the evidence

There are some limitations of the evidence supporting the effectiveness of MBIs in the non-clinical population. For example, most of the studies compared mindfulness with a waitlist control condition which does not account for placebo or non-specific effects of mindfulness training (Chiesa, Calati, Serretti, 2011). Additionally, some

studies (e.g. Nila, et al., 2016) excluded participants with aversive opinion about mindfulness practice, thereby, artificially enhancing engagement and effectiveness scores. Moreover, participant demographics of most studies were homogenous making the results less generalizable (e. g. Shapiro et al., 2010). In addition, studies on the non-clinical population used a standard protocol-based format of MBI although these versions were developed for the clinical population. Future studies could adapt these intensive MBIs for the non-clinical populations. However, based on the current evidence, it can be fairly concluded that MBIs may be of some benefit to psychological health in the non-clinical population.

1.2.3 Other Parameters of Effectiveness of MBIs

Since the evidence base for MBIs include good quality meta-analyses, systematic reviews and RCTs published in good quality peer-reviewed journals, it can be argued that there is substantial evidence of its effectiveness (NICE, 2006). Consequently, MBCT has been recommended by the NICE (2009) guidelines for treatment of recurrent depression (with three or more episodes). However, there are several other parameters that contribute to the measurement of effectiveness such as, practice-based evidence, neurophysiological evidence and cost-effectiveness engagement.

1.2.3.1 Practice-based Evidence

Most of the evidence of MBIs described in the previous sections are based on RCTs. Although RCTs are crucial in evidencing the effectiveness of MBIs, the study settings may be different from the actual practice-based setting in several ways. In order to achieve sufficient power for the statistical analyses, RCTs usually employ rigorous participant retention strategies. These retention efforts often include pre-class interviews, discussion of difficulties that may arise during the treatment by therapists and including additional support such as scheduling telephone calls with participants

(see Williams et al., 2014). In addition to enhancing intervention engagement, these factors may increase satisfaction from the intervention, motivation to continue engaging in the intervention and thereby inflate effectiveness results. Moreover, an evaluation of the implementation process of MBCT in the UK revealed that several factors need to be considered in order to achieve the desired beneficial effects in practice-based settings. These include the development of strategic plans for implementing MBIs such as, greater support for trainee mindfulness therapists, better understanding of what mindfulness is and how it improves mental health conditions (Crane & Kuyken, 2012). Additionally, the study reported concerns such as a) lack of sufficient knowledge of MBIs among majority of professionals (60%), b) lack of space for group activities (62%), c) lack of organisational structures necessary to facilitate mindfulness sessions (72%). Thus, it is crucial to investigate the evidence of MBIs in the practice settings. A study on heterogeneous group of psychiatric adult outpatients indicated a significant pre-post improvement in mood, mindfulness skills and a significant reduction in severity and total number of perceived life stressors (Green & Bieling, 2012). This study reported a pre-post Cohen's *d* effect size of 0.50, which is comparable to the RCT studies (Nyklíček, van Son, & Pouwer, 2010) and is a promising evidence. Another study on psychiatric outpatients with residual depressive symptoms following a depressive episode revealed a significant reduction in depressive symptoms was found at the end of MBCT, and further reduction at one-month follow-up (Kingston et al., 2007). These evidence lend support to the effectiveness of MBIs in practice-based settings.

1.2.3.2 Neurophysiological Evidence

The effectiveness of MBIs can be further evidenced by more objective measures such as, changes in the neurophysiology of an individual. The positive outcomes of MBIs in the clinical population are reported in an RCT of participants with a history of suicidal depression. The results showed significant deterioration of pre-frontal activity (that signifies positive affective style) in the treatment-as-usual control condition, while no such patterns were noted in the MBCT condition (Barnhofer et al., 2007). Another study reported that coordination of chaotic activities of the heart and the brain increased during MBSR training (Gao et al., 2016). Asymmetries in the alpha bands in electroencephalogram (EEG) in a resting state are often used as a predictor global response dispositions of affective style by considering the interactions of situation-specific emotional demands and capabilities to regulate emotions in challenging situations (Keune, Bostanov, Hautzinger & Kotchoubey, 2011). A recent study reported positive effects in the alpha symmetry through increased mindfulness after an MBCT intervention (Keun et al., 2011). Other studies have revealed that participation in MBSR is associated with changes in gray matter concentration in brain regions involved in learning and memory processes, emotion regulation, self-referential processing, and perspective taking (Holzel et al., 2011). Moreover, evidence suggests that MBIs alter intrinsic functional connectivity in ways that may reflect a more consistent attentional focus, enhanced sensory processing, and reflective awareness of sensory experience (Kilpatrick et al., 2011). A systematic review and meta-analysis on neurobiological changes and clinical benefits related to mindfulness practice revealed that mindfulness practice activates the prefrontal cortex (PFC) (responsible for cognitive behaviour and decision making) and the anterior cingulate cortex (ACC) (responsible for emotion

processing, learning and memory) (Chiesa & Serretti, 2010). These results indicate promising outcomes of MBIs when measured by neurophysiological parameters.

1.2.3.3 Cost effectiveness

Another parameter of assessing the effectiveness of an intervention is through the economic context (NICE, 2006), although the study of the cost-effectiveness of MBIs is in its infancy. Cost-effectiveness is usually calculated incorporating the costs such as therapists' salary band, time spent by therapist in running MBI classes, patient costs and other service costs which result in unit cost schema and balanced against any potential savings such as, reduced GP visits, hospital admissions (see Kuyken et al., 2015). Cost-effectiveness would constitute of net-benefit with effectiveness measured in terms of the primary outcome measure (see Kuyken et al., 2015). A recent RCT examined the cost of MBCT per participant in comparison to anti-depressant medication (Kuyken et al., 2015). Results revealed that group MBCT cost £112 per participant and total health and social care cost for each participant did not differ significantly between the MBCT and the maintenance antidepressants group (mean difference = £124, $p=0.80$). Another cost effectiveness study reported that although MBCT participants had higher mental health costs compared to enhanced usual care participants, MBCT participants had lower hospital costs (Ravensteijn et al., 2013). In summary, both studies concluded that although MBIs may cost higher than treatment-as-usual, however, MBIs were either equally or more effective than treatment-as-usual.

1.2.4 How do MBIs work? - Mechanisms of Change

MBIs were originally developed based on distinct theoretical framework of the mechanism of change. The theoretical underpinning of MBIs is that mindfulness skills lead to the development of awareness and non-judgmental acceptance of inner and outer experiences. This awareness and acceptance results in positive mental health outcomes

(see Kabat-Zinn, 1990; Segal, 2002). Mindfulness aims to cultivate adaptive mechanisms such as experiential self-reference (Watkins & Teasdale, 2004; Watkins, 2004) compared to maladaptive techniques such as self-referential thinking. Mental health problems such as, depression and anxiety are characterized by self-referential perseverative thinking styles such as, rumination and worry (Kertz et al. 2015). Rumination (Nolen-Hoeksema 1991) and worry (Borkovec et al. 1998) are kinds of maladaptive repetitive negative thinking styles. Theoretically, developing mindfulness skills can alter the habitual maladaptive ruminative and worrying thoughts and decenter from the content of thoughts (Wells, 2005). Additionally, mindfulness enhances present-oriented consciousness rather than past and future-oriented consciousness in rumination and worry respectively (Brown, Ryan & Creswell, 2007).

These theoretical conceptualisations of the mechanism of MBIs have initiated research on mechanism of change in this intervention. Research on mechanism of change suggests that MBIs bring positive health outcomes through increasing mindfulness and reducing rumination and worry (Gu, Strauss, Bond & Cavanagh, 2015). Thus MBIs improve mental health through decreasing perseverative thinking styles, such as rumination and worry, and by changing the type of attention focussed on the self (Marchand, 2013). This re-perception of the self (Shapiro, Carlson, Astin & Freedman, 2005) helps in de-centering from one's thoughts and emotions, thereby cultivating the non-judgmental moment-by-moment awareness of mindfulness (Dobkin, 2008). A recent RCT revealed that effect of MBSR on anxiety was completely mediated by the decentering process of mindfulness (Hoge et al., 2015).

According to Garland, Gaylord and Park (2009) (see Fig. 1.1) for an individual with mindfulness skills, the appraisal of an event as a threat or harm, can trigger adaptive response of decentering to the process of consciousness rather than the content of

thoughts. The decentering or ‘being’ mode enhances awareness and attentional flexibility. This meta-cognitive awareness, in turn, helps in the positive reappraisal of the threat. Consequently, this reappraisal leads to positive emotions such as trust and compassion. These positive emotions reduce stress and impacts the following appraisal process.

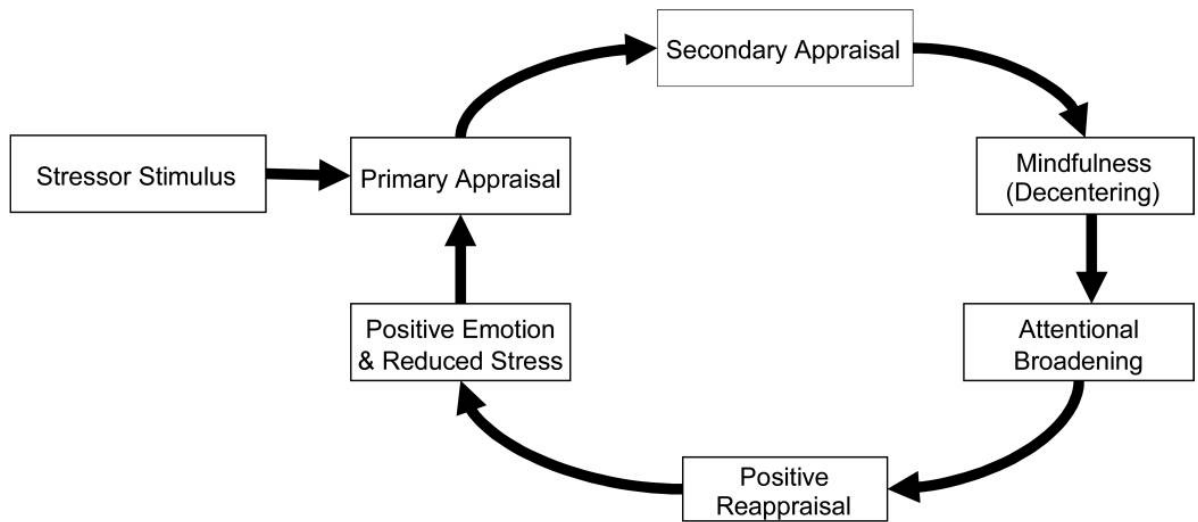


Fig. 1.1: The Mindful Coping Model *Extracted from Garland, Gaylord and Park, 2009*

Mindfulness practice is also associated with improved emotional self-regulation and reduced emotional reactivity (Brown, Goodman & Inzlicht, 2013; Taylor et al., 2011; Goldin & Gross, 2010). A recent study comparing an open monitoring mindfulness exercise to distraction and attentive exercise revealed that enhanced initial emotional response to negative stimuli, indicating increased emotional exposure and successive repetitions of mindfulness reduced and ultimately removed the affective response amplification, suggesting extinction of habitual emotional reactions (Uusberg, Uusberga, Talpsep & Paaverd, 2016).

There is also evidence suggesting that MBIs work by increasing mindfulness and compassion. A meta-analysis reported that pre-post improvements in symptom reduction

for participants with psychosis was strongly moderated by mindfulness, acceptance, and compassion (Khouri, Lecomte, Gaudiano & Paquin, 2013). Another meta-analysis revealed that mindfulness, compassion and meta-awareness mediated the positive effects of MBCT on participants with recurrent major depressive disorder (MDD) (van der Velden et al., 2015). Thus evidence suggests that increased mindfulness, greater decentering, reduced perseveration, reduced emotional reactivity and improved emotional regulation and compassion may be the underlying mechanisms of MBIs effects on psychological well-being.

1.2.5 Conclusions

In summary, considerable research has been examined the effectiveness of MBIs in bringing positive health outcomes. The effects are reflected in both subjective and objective data. Hence, based on the evidence it may be argued that engaging in MBIs may lead to positive health benefits.

1.3. Adapted Mindfulness-Based Interventions (MBIs)

The promising evidence supporting the effectiveness of MBIs has resulted in proliferation of research investigating the effectiveness of adapted forms of MBIs that reduce administration costs, efforts and time-demands. For instance, MBIs have been adapted to be delivered through telephone (Reilly-Spong, Reibel, Pearson, Koppa, & Gross, 2015), online (Spijkerman et al., 2016); as a 4-week intervention (Keng, Phang & Oei, 2015; Jain et al., 2007) and as self-help (Cavanagh et al, 2014; Taylor, Strauss, Cavanagh & Jones, 2014). These low-intensity interventions improve dissemination in several ways such as a) reducing service costs, waiting lists, and distance to access care (Wang Simon & Kessler, 2003), b) reducing challenges of coordinating 8-week, two-hour

sessions (Boggs et al., 2014), and c) reduces challenges due to shortage of trained mindfulness therapists (Kabat-Zinn et al., 2007).

1.3.1 Online MBIs

In order to reduce cost and increase access to mindfulness, researchers have explored the beneficial effects of online MBIs. There are several variations of online MBIs such as, virtual classrooms (e.g. Hudlicka, 2013) which have group time and structure similar to standard MBIs, while other online versions are entirely self-guided (e.g. Krusche, Cyhlarova, King & Williams, 2012). Studies have revealed that participation in online MBIs can significantly reduce perceived stress upon completion and follow-up, with pre-post effect size (Cohen's $d = 1.57$) comparable to class-based mindfulness programmes (for example, Cohen's $d = 1.02$ in Carmody, Baer, Lykins & Olendzki, 2009) (Krusche et al., 2012). A recent meta-analysis on online MBIs revealed a moderate effect size ($g=0.51$) on stress and small but significant beneficial impact on depression ($g=0.29$), anxiety ($g=0.22$), well-being ($g=0.23$) and mindfulness ($g=0.32$) (Spijkerman, Pots & Bohlmeijer, 2016). The effect size in this meta-analysis is less than the pre-post effect sizes above, as these are derived from RCTs and hence are controlled effects. However, these findings had limitations pertaining to limited RCTs included in the studies and lack of active control conditions. A recent RCT compared online MBCT with and active online pain management psychoeducation. Results revealed that only participants in the online MBI group enhanced ability to manage stress and emotion, increased reduction in present pain and increased ability to enjoy pleasant events (Dowd et al., 2015). Hence, the findings suggest promising results of online interventions.

1.3.2 Brief MBIs

Several studies have started investigating the effectiveness of brief MBIs in order to disseminate the beneficial effects of MBIs while reducing the time demands. A 4-week MBI program on psychological health among medical students and whether the effects were mediated by changes in mindfulness (Keng, Phang & Oei, 2015). Results showed that the intervention improved depressive symptoms, anxiety, general psychiatric symptoms, perceived stress, subjective happiness and satisfaction with life compared to the control group. Moreover, low baseline trait mindfulness predicted greater improvements on depressive and anxiety symptoms. Another RCT comparing a 4-week mindfulness meditation intervention to a somatic relaxation training reported that the mindfulness group showed significant reductions in distractive ($d = 0.25$; $p < .04$) and ruminative thoughts and behaviours ($d = 0.57$; $p < .04$) in comparison to the control condition (Jain et al., 2007). Brief MBIs have also shown promising results in significantly improving burnout symptoms, relaxation and life satisfaction among nurses and nurse aides (Mackenzie, Poulin & Seidman-Carlson, 2006). Brief mindfulness meditation is reported to improve both mental state attribution and empathic concern (Tan, Lo & Macrae, 2014). The brief mindfulness interventions were congruent with the underpinning philosophy of MBIs and included mindfulness exercises such as, shorter group sessions with a didactic section and experiential exercises and shorter homework assignments. Evidence suggests that there is no significant correlation between effect size and number of MBSR in-class hours in the clinical as well as the non-clinical population (Carmody & Baer, 2009). However, a limitation of this review was the range of programs included in the review ranged from 4-weeks to 10-weeks. MBIs have been adopted to briefer (2-week) (see Cavanagh et al., 2013) versions and future studies could explore the immediate and long-term effects of

such interventions. Thus, briefer MBI programs may be efficacious in reducing psychological symptoms. In this context, it is noteworthy that time commitment is often accounted as a barrier to engagement (Wyatt et al., 2014). Hence, brief interventions may be beneficial as these are effective and reduces burden of the participants. However, as argued earlier further research is required to draw definite conclusions of the immediate and long-term effects of brief MBIs.

1.3.3 Mindfulness-based Self-Help (MBSH) interventions

Shortage of trained MBI therapists and the challenge of co-ordinating and scheduling the classes contribute to the challenges of dissemination of MBI groups (Boggs et al., 2014; Crane & Kuyken, 2012), thus initiating research investigating the effectiveness of mindfulness-based self-help (MBSH) interventions. An online MBSH intervention for reducing residual depressive symptoms reported reduction in depressive severity, rumination and increase in mindfulness (Dimidjian et al., 2014). A meta-analysis of self-help mindfulness and acceptance based therapies reported that significant benefits in mindfulness/acceptance, depression and anxiety compared to control conditions (Cavanagh, Strauss, Forder & Jones, 2014).

1.3.4 Brief MBSH interventions

Qualitative studies exploring participants' experiences of group MBIs have revealed challenges of time commitment as a major hindrance of engagement in the MBIs (Wyatt et al., 2014), prompting research into brief MBSH interventions. An RCT of a brief web-based MBI revealed trends with medium effects in intention to treat (ITT) analysis, however, these results were not statistically significant conceivably due to the reported group-differences in baseline measures (Glück & Maercker, 2011). Brief MBSH interventions have also been shown to be effective in leading to higher

mindfulness scores in comparison to control conditions (Hedge's $g = 0.49$) and reducing anxiety (Hedge's $g = -0.34$) and depression symptoms (Hedge's $g = -0.37$) (Cavanagh et al., 2013). These effect sizes are comparable to those (between-group effect size Cohen's $d = 0.47$ on anxiety symptoms) reported in a meta-analysis of traditional face-to-face MBIs (Nyklíček, van Son, & Pouwer, 2010). More recent studies have revealed brief MBSH interventions also prevent stress related working memory impairments (Banks, Welhaf & Srour, 2015). Hence, there is some evidence suggesting that brief MBSH interventions bring positive mental health outcomes that may be comparable to class-based MBIs.

1.4. Engagement in Psychotherapy

Based on the literature, it can be fairly concluded that 8-week MBIs and its variations can be effective interventions in bringing positive mental health outcomes, when effectiveness is measured through changes in mental health attributes. Another factor that contributes to effectiveness in the psychotherapy literature is engagement. Engagement is crucial as dropouts from treatment result in reduced service cost-efficiency, lowered client and staff morale, disruption of therapy groups and denial of the service to others who could have used it (McMurran, Huband & Overton, 2010). Moreover, effectiveness of an intervention is only credible if participants are able to engage with the intervention. Engagement with psychotherapy is associated with positive treatment outcomes (LeBeau, Davies, Culver, & Craske, 2013, while disengagement limits effectiveness (Oei et al., 1997) and may reduce psychological wellbeing (Fredrickson & Joiner, 2002). The focus of this thesis is to examine engagement in MBIs, however prior to exploring engagement in specific interventions, such as, MBIs, it is vital to first discern the literature pertaining to engagement in psychotherapy in general.

1.4.1 Definition of engagement in psychotherapy

A major concern in the literature of engagement in psychotherapies is the lack of a consensual definition of engagement (Drieschner et al., 2004; Ammerman et al., 2006). The most common definition of engagement in psychotherapy is dropout or premature discontinuation from the intervention (e.g. Swift & Greenberg, 2012). Premature discontinuation is defined withdrawal from the intervention “prior to recovering from the problems (symptoms, functional impairment, distress, etc.)” that led starting the intervention (Swift & Greenberg, 2012 p. 547). In some studies, (such as MBCT studies) recovery could be defined as relapse prevention. This definition includes discontinuation prior to reaching therapeutic goals as well as dropping out before completing the full course of the intervention. Premature discontinuations affect participants by resulting in poor health outcomes (VanDeMark et al., 2010; Lampropoulos, 2010; O’Brien, Fahmy & Singh, 2009), other group members by interrupting therapy groups (Deyo, & Inui, 1980), as well as for service providers by lowering staff morale (Mensing, Diamond, Kaminer & Wintersteen, 2006; Deyo & Inui, 1980) and developing a sense of uncertainty among staff members (Piselli, Halgin, & MacEwan, 2011). Additionally, premature discontinuation reduces cost-effectiveness of mental health services (O’Brien et al., 2009). A recent meta-analysis revealed dropout rates of 19.7% across all psychotherapies (Swift & Greenberg, 2012) indicating 1 in every 5 participants drop out from psychological interventions. This rate is much higher in real world settings with dropout rate ranging to up to 58% (IAPT Annual report, 2015), indicating more than half the participants may drop out from the interventions. This figure characterizes a varied range of rates, definitions and measures of dropout but nevertheless highlights the concerns and importance of investigating engagement in psychotherapy in general. Interestingly, this meta-analysis pointed out

that when engagement was measured through therapist judgment, this average rate almost doubled (37.6%), indicating that there are attributes of engagement that are excluded from simple engagement measures such as dropout rates.

Engagement in psychotherapy has been defined as active participation in the intervention (Tetley, Jinks, Huband & Howells, 2011). Active participation included attendance and completion of the intervention, sharing ‘inner world by disclosing their thoughts, feelings, problems, and history’ and engaging in between-session tasks such as homework (Tetley, Jinks, Huband & Howells, 2011 p. 928). A recent review of seventy-nine studies summarising how engagement in psychotherapeutic interventions has been defined, concluded that engagement is a four-fold construct including attendance, involvement, homework compliance and therapeutic relationship (Holdsworth, Bowen, Brown & Howat, 2014; see Fig. 1.2). The definition by Holdsworth et al. (2014), thus, incorporates all forms of efforts made to participate in the intervention.

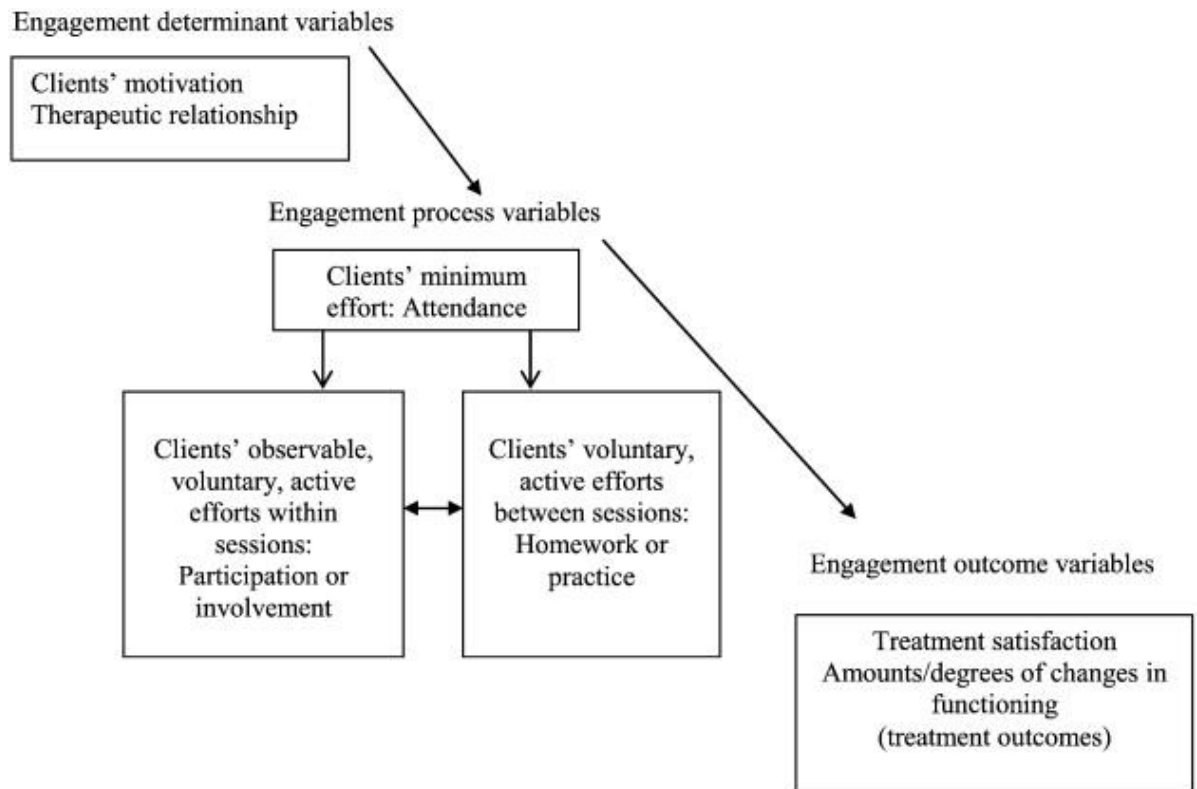


Fig. 1.2: *Extracted from Holdsworth et al., 2014* Model of engagement in psychotherapy

1.4.2 Measures of engagement in psychotherapy

Although dropout is the most commonly used measure of engagement, there are several variations in how dropout is measured. Some dropout measures pertain to the dose-effect relationship (Lambert, 2007) and measure dropout as attending less than specified number of sessions (Wierzbicki & Pekarik, 1993). Dropout is also measured through failure to attend scheduled intervention appointments without rescheduling future sessions (Swift & Greenberg, 2012). In the psychotherapy literature, dropout is also typically measured through therapist judgment, where the therapist makes a decision on whether or not a participant will be considered as a dropout (Swift & Greenberg, 2012). Moreover, often intervention dropout is confounded as study dropout, indicating participants who fail to provide post-intervention data (e.g. Ost, 2008). However, engagement refers to more than mere dropout rates. Pertaining to the definition by Holdsworth et al. (2014), dropout only measures the attendance aspect of

engagement. Other scales that measure attendance are The Treatment Engagement Rating (TER) scale (Drieschner & Boomsma, 2008) which measures participation, defined as attendance and punctuality.

Involvement, the second facet of engagement, is measured through proxies such as motivation, intention, commitment and belief in outcomes (Holdsworth et al., 2014; Tetley et al., 2011). Psychometric scales such as the treatment motivation questionnaire (Ryan, Plant & O'Malley, 1995), client evaluation of self and treatment (CEST; Simpson, 2001) and client satisfaction questionnaire (Attkisson & Zwick, 1982) measure some of these attributes of engagement. Although using these proxies of engagement has been criticized in the literature for conflating the concept of engagement with factors that may cause or lead to therapeutic engagement (Drieschner et al., 2004; Tetley et al., 2011), it is agreed that it is difficult to measure active participation in interventions through self-report scales without these proxies (Tetley et al., 2011).

Homework compliance is often measured by the amount of effort and time spent on homework (Westra & Dozois, 2006) or completing the homework (Graff et al., 2009). Most therapies involve some work to generalise learning between therapy sessions (e.g. CBT). This measure has been criticized for not considering the quality of homework (Holdsworth et al., 2014). Homework compliance is an important measure of engagement as it includes between-session engagement that is considered as an attribute of 'active participant' (Tetley et al., 2011). However, only few studies have used homework completion as a measure of engagement (Graff et al., 2009; Westra & Dozois, 2006) conceivably due to other measures being more significant measures of engagement (e.g. Baydar et al., 2003).

Therapeutic relationship, the final facet of engagement, is more commonly explored in the literature. Several psychometric scales such as, the client evaluation of self and treatment (CEST; Simpson, 2001), the working alliance inventory (Hatcher & Gillaspy, 2006; Horvath & Greenberg, 1986, 1989) and the satisfaction with therapy and therapist scale (Oei & Shuttlewood, 1999) measures therapeutic relationships.

Engagement in self-help therapies are usually measured through self-report scales (Christensen, Griffiths & Farrer, 2009). A recent meta-analysis on internet-based self-help interventions pointed out a two-fold measurement of engagement – quantitative and qualitative (Simco, McCusker & Sewitch, 2014). Quantity of adherence referred to mean percentage of the intervention completed by participants while quality of adherence referred to exercises per week, plans to continue usage, log ins per week. However, other facets of engagement, such as involvement, were not measured. Engagement in self-help based interventions are also measured as the proportion of participants who use the intervention as it is intended to be used (Kelders, Kok, Ossebaard & Van Gemert-Pijnen, 2012) and treatment progression and registered exercises (Alfonsson, Olsson, & Hursti, 2016).

1.4.3 Factors associated with engagement in psychotherapy

Within the engagement in psychotherapy literature, factors associated with dropout has been most commonly investigated and dropout rate is the most common definition of engagement (e.g. Swift & Greenberg, 2012). Higher dropout rates are associated with several factors such as characteristics of participants, intervention characteristics and outcomes and therapist attributes (Swift & Greenberg, 2012). Participant characteristics include increased severity of symptoms (Gallagher, Delgado & Barlow, 2012), avoidant coping styles (Kim, Zane & Blozis, 2012) and other factors such as lower motivation (Frei & Peters, 2012), lower readiness to change (Boswell et

al., 2012) and treatment preference (Kwan, Dimidjian & Rizvi, 2010; Elkin et al., 1999). Treatment characteristics include longer treatment duration (Cooper & Conklin, 2015), outcomes of treatment (Scott, King, McGinn, & Hosseini, 2011) and group dynamics (Illing et al., 2011; Kirchmann et al., 2009). Therapists' increased professional self-doubt (Nissen-Lie, Monsen, Ulleberg, & Rønnestad, 2013) and other characteristics such as therapists' optimism are associated with dropout from interventions (Beck, Friedlander & Escudero, 2006). Literature on factors associated with other forms of engagement such as, involvement, is inadequate highlighting a concerning gap in the psychotherapy literature.

Engagement in self-help interventions have been a major concern as pure self-help therapies tend to have higher attrition rates than supported interventions (Eysenbach, 2005). Unsurprisingly, several studies have investigated factors associated with self-help based intervention. A recent systematic review of adherence to web-based interventions revealed that intervention characteristics and persuasive technology elements such as, human-computer interactions and computer-mediated communication explain a substantial variation in adherence (Kelders, Kok, Ossebaard & Van Gemert-Pijnen, 2012). A systematic review of internet interventions for anxiety and depression reported disease severity, treatment length and chronicity as predictors of adherence (Christensen, Griffiths & Farrer, 2009). These factors are similar to the factors predicting engagement in face-to-face psychotherapies (e.g. Gallagher, Delgado & Barlow, 2012; Cooper & Conklin, 2015). A recent RCT reported that dropout was predicted by treatment credibility and motivation level for internet-based cognitive behavioural relaxation program (Alfonsson, Olsson, & Hursti, 2016). These varied predictors of engagement may be due to the variations treatments or may be a consequence the lack of a formal definition of engagement in psychotherapy.

1.5. Engagement in MBIs

Given the concerns of engagement in psychotherapy in general and how engagement can limit effectiveness of interventions (Oei et al., 1997), the focus of the current thesis is to define engagement and examine factors associated with engagement in MBIs.

1.5.1 Definition of engagement in MBIs

Engagement in MBIs is typically defined according to the protocol (Kabat-Zinn 1990; Segal et al, 2002) in terms of session attendance only (for example, Crane & Williams, 2010; Williams et al, 2014; Vollestad, Sivertsen & Nielsen, 2011). For 8-session MBIs, attending less than four out of eight sessions is classed as disengagement. Another meta-analysis on online MBIs found that studies varied in their definition of engagement ranging from 100% of the sessions completed to ≥ 5 sessions completed (Spijkerman, Pots, & Bohlmeijer, 2016). An alternative measure of engagement in MBIs is homework completion. A review on participants' engagement homework in MBIs revealed that out of the 24 studies that evaluated the association of homework completion and measures of clinical functioning only over half (13 studies) reported benefits of homework, while few studies revealed a negative association between practice and outcomes (e.g. Kristeller & Hallett, 1999; Vettese et al., 2009). However, as argued in the psychotherapy literature (Holdsworth et al, 2014; Tetley et al., 2011), attendance and homework are only two aspects of engagement. This is especially true for MBIs as engagement in mindfulness requires both formal practices as well as psychological participation (Kabat-Zinn 2003), that cannot be measured by attendance rates only. This highlights the paucity of studies investigating engagement in MBIs.

The definition of engagement in mindfulness-based self-help (MBSH) interventions is more nuanced. A recent meta-analysis reported common engagement metrics of self-help based MBIs as the number of meditation practices reported, time spend engaged in meditation practice and number reading the self-help book and completing exercises (Cavanagh et al., 2014). Although these definitions are more detailed compared to engagement in face-to-face MBIs, they are still restricted to physical attributes of engagement.

1.5.2 Engagement in MBIs – quantitative analysis

A recent meta-analysis reported a median of 15.5% drop out from MBIs ranging from 8% to as high as 37% among people diagnosed with a current episode of an anxiety or depressive disorders (Strauss, Cavanagh, Oliver, & Pettman, 2014). Another meta-analysis of MBIs on the non-clinical population reported a dropout rate of 16.99%, ranging from 3% to as high as 34.9% (Khoury et al., 2015). Hence, although the mean attrition rates from MBIs are similar to other psychotherapies (19.7%; Swift & Greenberg, 2012), in some MBI studies more than one in three people tend to dropout from the intervention. Dropout from online based MBIs, defined as completing all online sessions, ranged from 8% to as high as 60.5% (Spijkerman, Pots, & Bohlmeijer, 2016). This is similar to the mean dropout rate of 50% in other web-based psychotherapeutic interventions (Kelders et al., 2012). Hence, across all these studies, engagement in MBIs has been measured in terms of attendance and practice rather than involvement. Moreover, there are no reviews that have summarised the rate of engagement in MBIs and the relative risk of dropping out of MBIs in comparison to other psychotherapies.

To the best of our knowledge only one quantitative study has explored factors associated with engagement in MBIs. This randomised controlled trial reported a

dropout rate of 30.3% (Crane & Williams, 2010). The factors that predicted dropout from MBIs were brooding (a form of rumination) and effectiveness of change. Higher levels of depressive rumination and cognitive reactivity were also associated with dropout from the intervention. Interestingly, MBIs result in positive health outcomes by lowering rumination (Gu et al., 2015). The finding that rumination is a barrier to engagement in MBIs is theoretically meaningful as rumination and mindful awareness of inner and outer experience are conflicting mental processes, consequently it may be difficult for habitual ruminators to adapt the de-centered mindful state, although paradoxically it might be most beneficial to them.

1.5.3 Engagement in MBIs – qualitative analysis

Several qualitative studies have explored the challenges of engaging in MBIs. A recent meta-synthesis of fifteen qualitative studies reported that the common struggles of participating in face-to-face MBIs identified in the meta-synthesis are physical limitation and finding time to practice, grasping the novel concepts of mindfulness, lack of motivation to practice due to low mood and becoming distressed as a result of emerging negative thoughts (Wyatt et al., 2014; see Fig. 1.3). Moreover, detaching observation from the content of thoughts to the awareness of thoughts is often described as one of the most ‘uncomfortable experiences’ (Wyatt et al., 2014, p. 223). A grounded theory on mindfulness practice reported that one of the main reason participants disengaged was the urge to “do” rather than to “be” (Langdon et al. 2011).

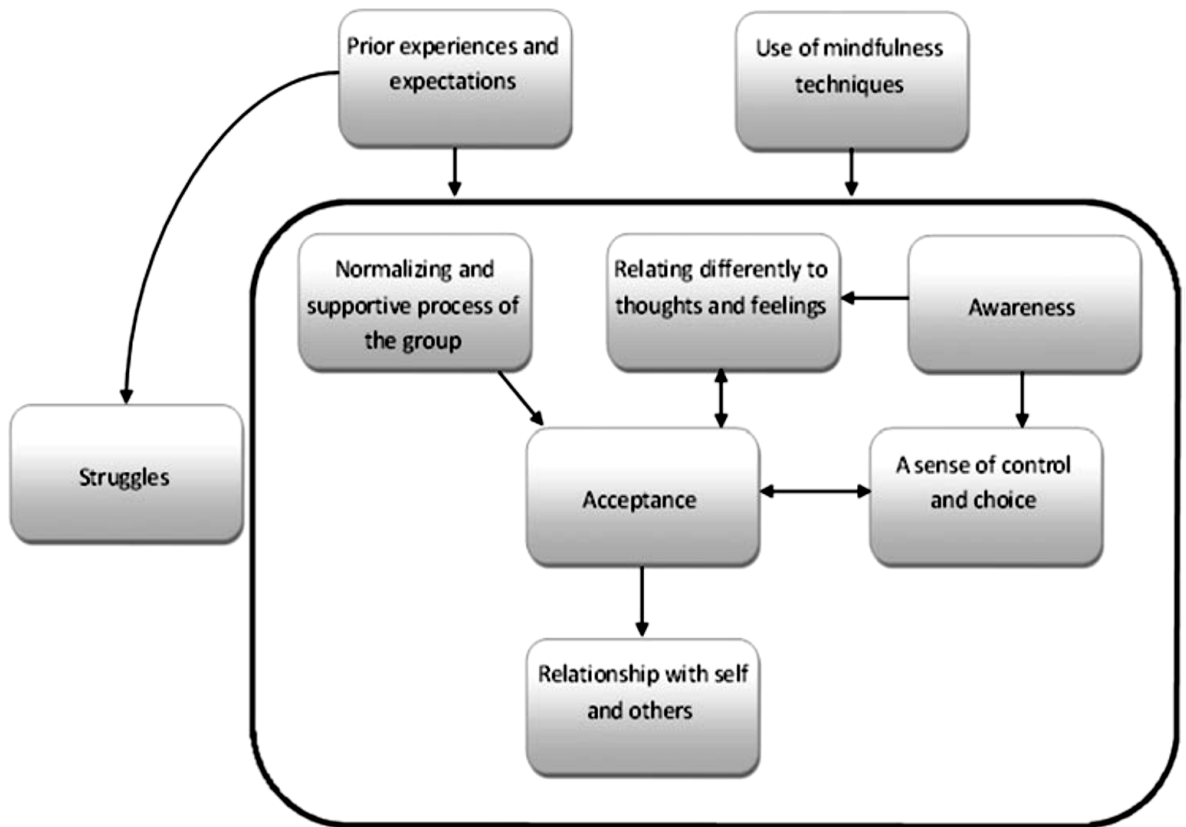


Fig. 1.3: *Extracted from Wyatt et al., 2014* Synthesis of participants' experiences of mindfulness-based interventions.

Therefore, a strong emerging theme from quantitative and qualitative literature is habitual perseverative thinking styles, such as rumination, may be associated with disengagement from MBIs. It is vital to investigate whether barriers such as rumination and worry, are known to implicate in the maintenance of, respectively, depression and generalized anxiety disorder (Kertz et al. 2015).

1.5.4 Investigating factors associated with engagement in MBIs through mindfulness-based self-help (MBSH) interventions

In order to effectively investigate factors associated with engagement in MBIs, it may be beneficial to consider MBSH, for several reasons. First, engaging in self-help interventions is more challenging than face-to-face intervention (Eysenbach, 2005). Hence the engagement rate is likely to be more conservative compared to face-to-face

MBIs, providing greater exposure to disengagement. Second, engagement in psychotherapy is often magnified by non-specific factors such as group dynamics (Marziali, Munroe-Blum, & McClearly, 1997) and relationship with the therapists (Barber et al., 2008). Participants of group psychotherapy often report being able to effectively engage with intervention by engaging with the other participants and receiving mutual support and affiliation (Marziali, Munroe-Blum, & McClearly, 1997). This is reflected in the MBI literature where the '*normalising and supportive process of the group*' has been identified as a major theme of the experience of participating in an MBI in a recent meta-synthesis of qualitative studies (Wyatt et al., 2014). Effective relationship with the therapist may also inflate engagement in psychotherapy (Barber et al., 2008; Connors et al., 1997). Since therapeutic relationship is limited in self-help interventions, restricting to MBSH may aid the effective investigation of the challenges of remaining engaged with mindfulness practices. Hence, due to the lack of support from group or therapist, self-help interventions can aid dismantling analysis of engagement that can explore engagement factors specific to mindfulness practice. Additionally, since there is a growing research and clinical interest in MBSH, knowledge in relation to factors of engagement in MBSH is important in its own right.

1.6. Factors associated with engagement in MBIs – The theory

As highlighted in section 1.5., it has emerged from previous research that perseverative thinking styles such as rumination and worry may be factors associated with disengagement from MBIs. Since rumination and worry are known to maintain depression and anxiety respectively (Kertz et al., 2015), it is important to understand the theoretical underpinnings of such perseverative thinking styles.

1.6.1 Rumination

Rumination is defined as the process of thinking perseveratively about one's feelings and problems and correlates with maladaptive cognitive styles, including negative inferential or attributional styles, dysfunctional attitudes, hopelessness, pessimism and self-criticism (Nolen-Hoeksema, Wisco & Lyubomirsky, 2008; Nolen-Hoeksema et al., 1994; Nolen-Hoeksema, Parker, & Larson, 1999). The response style theory (Nolen-Hoeksema, 1991) states that rumination increases distress and perpetuates depression through several mechanisms. For instance, rumination increases the effect of depressive mood on thinking. Thus, making people more likely to comprehend their current situations by using negative thoughts that are activated by the depressive mood (Nolen-Hoeksema, Wisco & Lyubomirsky, 2008). Hence, the process of rumination could be antagonistic to the mindful 'being mode'.

1.6.2. Worry

Similar to rumination, worry is also a perseverative thinking style characterised by a chain of thoughts and events that are relatively uncontrollable and laden with negative affect (Borkovec et al., 1983). Worrying is often perceived as a problem-solving technique, however, due to the uncertainties of outcomes, worrying often leads to more negative outcomes (Borkovec et al., 1983). Moreover, focusing attention to inner events during worrying leads to disruption in the ability to meet with current environmental demands (Levey & Martin, 1982). Thus, similar to depression. Worrying is conflicting to the mindful awareness of present moments.

1.6.3. Theoretical model of the thesis

The process of being mindful consists of paying mindful attention, decentering and acceptance (Brown, Ryan, & Creswell, 2007; Baer, 2003; Shapiro, Carlson, Austin, & Freedman, 2006; Segal et al., 2002). Mindful attention refers to paying sustained

attention to external events and internal experiences (Kabat-Zinn, 1990; Brown & Ryan, 2003). Decentering denotes shifting the conscious processing more to the awareness of mental events and less to the content of these (Orzech, Shapiro, Brown and McKay, 2009). Acceptance involves enduring or approaching unwanted memories or events rather than avoiding these (Orzech, Shapiro, Brown and McKay, 2009).

The strategies involved in rumination and worry are similar in content and orientation in a non-clinical sample (Watkins, Moulds & Mackintosh, 2005). Both rumination and worry are repetitive processes that are orientated towards the past and future respectively (Watkins, Moulds & Mackintosh, 2005). This is contradicting to the decentering process of mindfulness. A grounded theory on mindfulness practice reported that one of the main reason participants disengaged was the urge to “do” rather than to “be” (Langdon et al. 2011). Hence, ruminating or worrying may lead to disengagement from the process of engaging with mindfulness meditation. Figure 1.4 represents the theoretical model of probable factors associated with disengagement from mindfulness techniques.

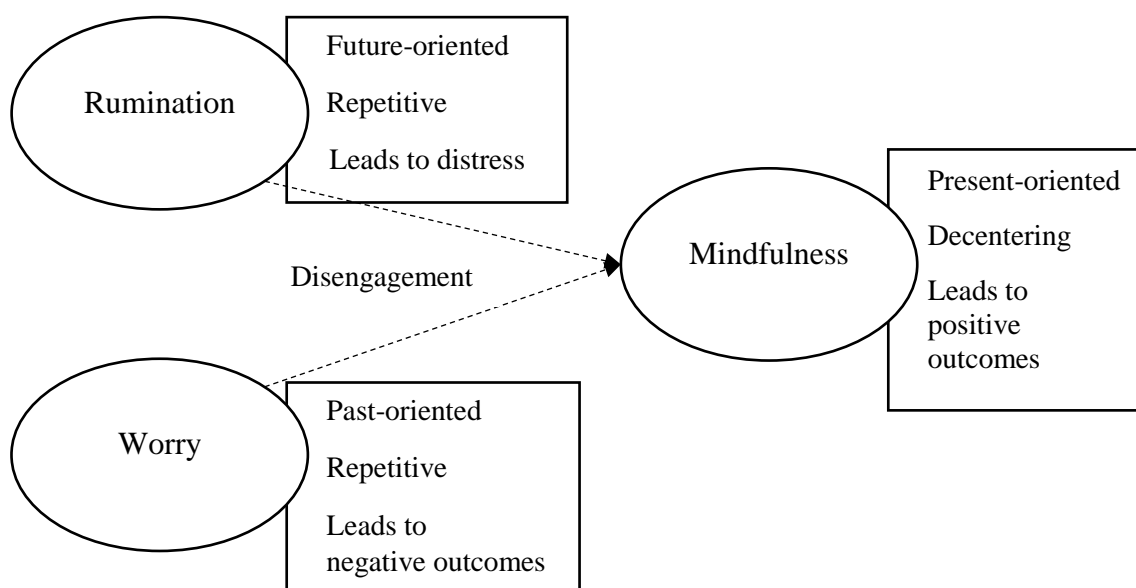


Fig. 1.3: The theoretical model representing some factors that could be associated with disengagement from mindfulness techniques.

1.7. Our definition of engagement in MBIs

1.7.1 Why define engagement in MBIs

One of the challenges of investigating engagement in MBIs is the lack of a proper definition of MBIs. As discussed earlier, the definition of engagement of MBIs is often restricted to only physical aspects such as attendance and amount of practice (Kabat-Zinn 1990; Segal et al, 2002; Cavanagh et al., 2014; Spijkerman et al., 2016; Vettese et al., 2009). However, engagement in psychotherapy can be defined more comprehensively, as physical engagement, psychological engagement that includes attendance, involvement, commitment, belief and therapeutic relationship (Holdsworth et al., 2014; Tetley et al., 2011). The construct of ‘involvement’ is particularly pertinent to MBIs as participating in MBIs is often described as involving “integrating mindfulness into life” (Langdon et al., 2011, p. 276). Moreover, the process of becoming more mindful appears to require “psychological participation” (Kabat-Zinn, 2003, p. 151) and involves not only performing discrete behaviour (e.g. formal

mindfulness practice) but also developing a radically different ‘being’ mode that can be entered at any time (Langdon et al., 2011). Hence, in order to investigate all aspects of engagement in MBIs, it is crucial to operationalize engagement drawing on this previous work.

1.7.2 Our definition of engagement in MBIs

We propose a definition of engagement in MBIs that involves *physical* engagement (session attendance and engagement in recommended between-session mindfulness practices) and *psychological* engagement. Psychological engagement we propose consists of five factors: (1) *motivation* to put time aside to participate in the MBI course; (2) *intention* to maintain a personal formal mindfulness practice during and after the MBI course; (3) *commitment* to bringing mindfulness into daily life; (4) the *belief* that practicing mindfulness will be beneficial to one’s mental health or wellbeing; and (5) the *therapeutic relationship* between the person and the MBI group and teacher. These five factors have established associations with treatment outcomes or treatment completion in the broader literature and so are good candidates for psychological engagement in MBIs: (1) motivation to participate in treatment is related to psychosocial functioning during treatment and to treatment progress (Simpson & Joe, 2004); (2) intention is associated with treatment completion (Zemore & Ajzen, 2014); (3) commitment or readiness is related to engagement in therapy (George et al., 1998); (4) belief in treatment effectiveness is associated with treatment retention (Kressel et al., 2000); and (5) the therapeutic relationship predicts attendance and participation in treatment (Lecomte et al., 2012).

1.7.3 Our measure of engagement in MBIs

Although several psychometric scales measure engagement in psychotherapy (see 2.3.3), these could not be used for the current research for several reasons. First none of the available scales measure the full range of facets of engagement. Second, the scales are limited due to the limited information available on the reliability and validity indices (Tetley et al., 2011). Finally, many of the available psychometric scales were designed for a particular population or treatment method (Tetley et al., 2014). Hence for the purpose of this thesis a self-report measure was developed to measure of both physical and psychological facets of engagement in MBIs. Physical engagement was measured by the product of the number of days of mindfulness practice and number of times mindfulness was practiced in each day. Psychological engagement, on the other hand, was measured on a five-point scale ranging from 1 (not at all) to 5 (completely) on items such as, how motivated participants were to set time aside to use the mindfulness intervention (motivation); how likely the participants were to engage with mindfulness after the intervention(intent); how often participants brought mindfulness principles into their lives (commitment); and how effective participants believed mindfulness was in helping to deal with stressful situations (belief). Therapeutic relationship was excluded from the measurement as this research restricted to pure self-help interventions only.

1.8. Conclusions

Research and clinical interest in MBIs have increased in the past few decades. Several systematic reviews and meta-analyses have evidence the effectiveness of MBIs treating a range of psychological health problems. Research on brief and/or MBSH interventions have shown promising preliminary results. However, it has been established how engagement in MBIs is an under-researched and important area within the literature.

Moreover, the paradox people likely to benefit most from MBIs tend to disengage is a concerning revelation. Hence the aims of this thesis are as follows:

- (i) Investigate the literature on engagement in MBIs and identify the relative risk of dropout
- (ii) Qualitatively investigate the experience of engaging in MBSH interventions
- (iii) Identify factors associated with engagement in MBSH interventions.

Chapter 2: Methodology

“An expert is one who knows more and more about less and less until he knows absolutely everything about nothing.”

— Nicholas Murray Butler

“That there is no such thing as the scientific method, one might easily discover by asking several scientists to define it. One would find, I am sure, that no two of them would exactly agree. Indeed, no two scientists work and think in just the same ways.”

— Joel H. Hildebrand

2.1 Introduction

The process of research is often considered analogous to solving mysteries – starting with a puzzle and ending in resolution (Barker, Pistrang & Elliott, 2015). However, scientific research may not always conclude with resolution, any usually ends with further research questions, thus taking science forward (see Fig. 2.1). Hence, research begins with forming ideas and identifying the research questions. These ideas may be complex and often clear philosophical paradigms of the ontology are required to determine the appropriate epistemological and methodological approaches. The epistemological and methodological perspectives of this thesis are discussed below. Once the ideas are formed, information is gathered, analysed and interpreted leading to conclusions that can be compared to the original ideas, often leading to generation of new ideas (Barker, Pistrang & Elliott, 2015).

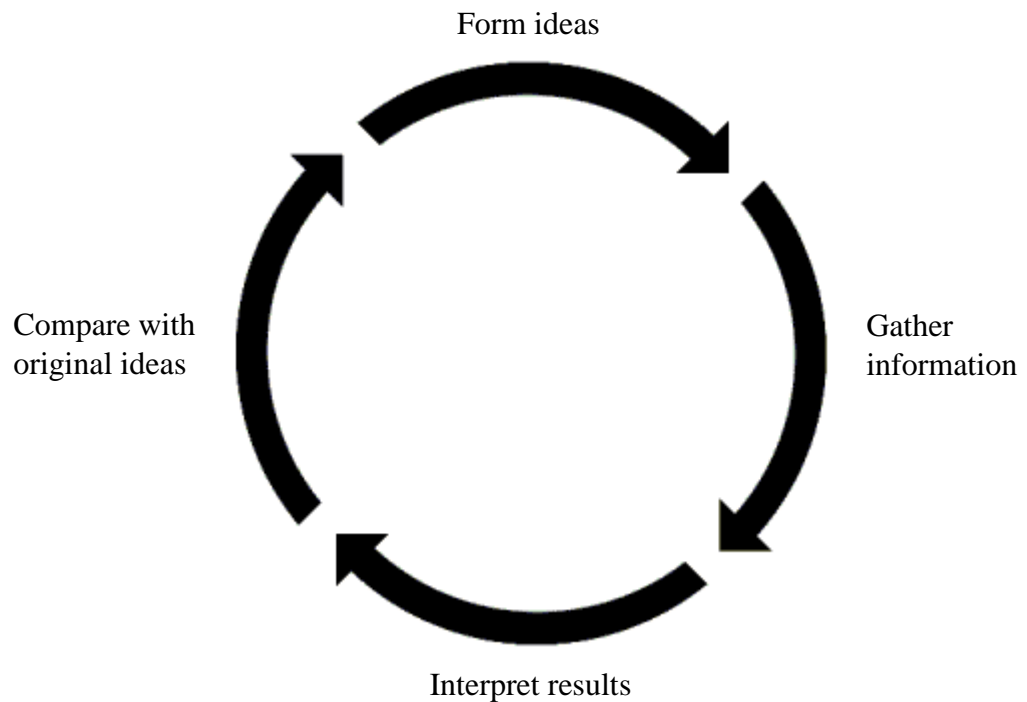


Fig 2.1. *Extracted from Barker, Pistrang and Elliott, 2016* The research cycle

Once the research question(s) is determined, the next step of any research is often defining the ontological paradigm the research will be based on and thereby determining the epistemological and methodological approaches. There are a range of contrasting ontological paradigms adopted in psychological research, from realism to constructivism (Marks & Yardley, 2004). The ontological position of realism is that reality exists and is objective (Sobh & Perry, 2006). Realism commonly uses quantitative methodologies (Johnson & Onwuegbuzie, 2004). Constructivism, conversely, proposes that reality is created by social interactions and several versions of subjective reality may exist (Raskin, 2002). Constructivism usually employs qualitative methodologies (Johnson & Onwuegbuzie, 2004). Research based on only one ontological approach may limit knowledge and insights of reality (Marks & Yardley, 2004). Hence research in complex sciences, such as, clinical psychology often encompasses a range of ontological paradigms in order to maximise validity of the

findings (Marks & Yardley, 2004). This has resulted in the rise of mixed methods research. Mixed methods research is defined as “the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study” (Johnson & Onwuegbuzie, 2004 p. 17). There are several purposes of using mixed methods in research, a) the triangulation of findings across multiple methods, which strengthens the cumulative conclusions of this work, b) complementarity – that is the elaboration, enhancement and clarification of results from one method with that of another (Greene et al., 1989), c) initiation through discovering paradoxes in the findings, d) development of method through information from findings of previous methods, and e) expansion across a range of research by using different methods (Johnson & Onwuegbuzie, 2004). However, using mixed methodologies within single research studies can be challenging due to key differences in the priorities of research methodologies underpinned by these different ontological traditions. For example, it is crucial to collect data from large sample for quantitative research in order to strengthen reliability, while qualitative research requires intensity or purposive sampling to boost information-richness. Finally, quantitative research requires elimination of inconsistent outliers from the data, while qualitative research might tend to focus on such variabilities (Marks & Yardley, 2004).

Research within this thesis incorporates different ontological perspectives in separate studies. Hence, although the overarching research question of this thesis is answered using “mixed methods” some studies employ only quantitative investigation while others include only qualitative examination. The mixed methods approach adopted in this thesis embodies the purposes of mixed methods research and allows triangulation of data from various sources. Additionally, experiments in this thesis are informed by the results of previous findings within this thesis. Finally, by using mixed

methods in separate research studies, this thesis overcomes some of the weaknesses of using mixed methods in a single study. These are, a) receiving less attention due to the limited practical results, b) incorporating a pragmatic approach that fails to provide structural answers to research questions, and c) failing to provide concrete answers often limit practical applications – which is crucial, especially in clinical research.

2.2 Journey of the current thesis

The methodological journey of the current thesis is represented in Fig. 2.2.

2.2.1 Secondary Data Analysis – Paper 1

“I don't want to write that first sentence until all the important connections in the novel are known to me”

– John Irving

It is common practice to start research from analysing what is already known. Hence, once the research question is determined, the first step of answering the question is starting from what is already known in the theoretical and empirical literature, by the process of systematic review. Secondary data is used in order to identify and analyse relationships among variables existing in the literature. Secondary data encompasses a wide range of empirical forms – from systematic reviews to surveys and can include quantitative as well as qualitative data (Smith, 2008). The current thesis employed such commonly used quantitative secondary data analysis – systematic review and meta-analysis which summarises and statistically combine outcomes data from relevant previous studies (Paper 1).

Systematic reviews are reviews that are based on clearly formulated question, identifies appropriate research studies, evaluates the quality of these studies, reviews the data and uses explicit methodological processes (Khan et al., 2003). The use of

systematic reviews has grown in the psychotherapy literature. A systematic review is a strong methodological tool as it summarises the data from a number of studies, thereby, increasing the strength of the conclusions (Khan et al., 2003). Systematic reviews are generally used to determine effectiveness and cost-effectiveness of treatments and also to ascertain future research directions (Khan et al., 2003). A key attribute of a good-quality systematic review is that it should be replicable and another research team should be able to achieve same set of data on repeating the methodology. (Moher et al., 2009).

Another form of secondary data analysis used in this thesis is meta-analysis. Meta-analysis is a method of analysing the data of a systematic review quantitatively. The main purposes of a meta-analysis are to a) increase power by including multiple studies with varied sample sizes, b) develop precision based on more information, c) increase variability in the participant demographics, thereby improving generalizability, and, d) resolve contradicting findings by using statistical analysis (Higgins & Green, 2011). Meta-analysis is a popular scientific technique of survey research where research articles are examined instead of participants (Lipsey & Wilson, 2001). The process of conducting meta-analysis follows the research cycle (Fig. 2.1) and begins with formulation of the research question and continues with data gathering, but unlike primary data collection, the data gathered for meta-analysis is derived from already published studies. Inclusion and exclusion criteria are developed based on the research question. The most common inclusion criterion is the availability of sufficient information in the published research reports to conduct the study. This is followed by critical appraisal and selection of studies based on the study qualities. Based on the research question, a suitable effect size measurement statistic is employed to conduct the statistical analyses – this is followed by interpretation on the results (Higgins &

Green, 2011; Cheung, 2015). The meta-analysis conducted in Paper 1 aimed to determine answers to fundamental questions such as, the rate of engagement in mindfulness-based interventions (MBIs), the commonly used definitions of engagement in MBIs and also to examine any factors related to engagement in MBIs already existing in the literature.

One of the most important strengths of secondary data analyses such as, meta-analysis is the being able to access large scale data to draw robust conclusions (Smith & Smith, 2008). Meta-analysis is also a useful tool of summarizing research findings and is an effective and organized method of researching large number of studies. (Lipsey & Wilson, 2001). However, a limitation of secondary data analysis is these techniques are usually intensive and require expertise in order to conduct a comprehensive analysis (Smith & Smith, 2008). A persistent limitation of meta-analysis is the inclusion of a mix of studies - this variation in studies may often lead to difficulties in constructing a distribution of effect sizes (Lipsey & Wilson, 2001). In order to overcome this limitation, a strict inclusion criterion was decided *a priori* before conducting the meta-analysis in this thesis (Paper 1).

2.2.2 Inductive Approach – Paper 2

“... scientific knowledge is only possible by demonstration from premises scientifically known: instead, he claims, there is another form of knowledge possible for the first premises, and this provides the starting points for demonstrations.”

– Aristotle, Posterior Analytics, Book II, Chapter 19 (Circa 330 B.C.)

The systematic review (Paper 1) revealed that the definition of engagement in MBIs is typically limited to session attendance and in addition, RCTs tend to report only study engagement. Additionally, an interesting finding was that participants in

MBI studies dropped out due to dissatisfaction with the intervention. Results from the systematic review in Paper 1 also highlighted the gap in understanding of the factors associated with engagement in MBIs. Given the lack of research in the area of engagement in MBIs, it was difficult to design empirical studies that used a confirmatory approach. A common methodological tactic in such instances is inductive approach to identify patterns and relationships among the variables under observation. Inductive research analysis is the process of coding the data without trying to fit it into a pre-existing theoretical framework (Braun & Clark, 2006). A range of qualitative research methodologies can be used for inductive analysis such as, grounded theory (GT; Glaser, 1992; Strauss & Corbin, 1998), narrative analysis (NA; Riessman, 1993), discourse analysis (DA; Burman & Parker, 1993) interpretative phenomenological analysis (IPA; Smith, Flowers, & Osborn, 1997), and thematic analysis (Braun & Clark, 2006). Each of these techniques have unique aims and generates specific results. For instance, grounded theory is a methodology used in order to understand human processes and to construct theory (Saldaña, 2011). Narrative analysis is a research genre that include a variety of approaches and aims to transform data to story formats (Saldaña, 2011). Discourse analysis is concerned with language and its role in psychological lives (Willig, 2013). IPA is the study of the nature and meaning of things (Saldaña, 2011). Thematic analysis, on the other hand, is a “method for identifying, analysing and reporting patterns within data” (Braun & Clark, 2006 p. 6). Since the research question was to identify patterns or associations of variables with engagement in MBIs, thematic analysis was deemed appropriate for this paper. Thematic analysis is used as a method for identifying, analysing and reporting themes and/or patterns within large datasets (Braun & Clark, 2006). Thematic analysis is a flexible analytical method that is essentially independent of theory or epistemology (Braun and Clark, 2006;

Boyatzis, 1998). Hence this qualitative approach fits with our research design as well as the epistemological stance of the thesis. Other reasons for the use of thematic analysis includes the advantages of thematic analysis, as noted by Braun & Clark (2006), over other qualitative analysis methodologies. First, thematic analysis is a method rather than a methodology. This means that thematic analysis only stipulates analytical processes for development of themes and is not based on a theoretically informed framework. This provides flexibility for data collection and analysis which is not offered by other qualitative methodologies. Second, although other approaches like grounded theory recognises patterns within the data, these techniques are complicated to conduct. Moreover, these techniques are often used without adequate knowledge, rigour and theoretical commitments of a pure grounded theory approach (Holloway & Todres, 2003). This often means that researchers use an adapted version of these complicated qualitative techniques. In contrast, thematic analysis is simple consisting of clear procedure of extraction, analysis and validation of the data. Additionally, thematic analysis is not a complex qualitative analysis and is recommended for researchers with limited experience of qualitative analysis (see Braun & Clark, 2006). Since the principle investigator of this thesis had limited experience of qualitative analysis, using this approach was suitable.

An advantage of thematic analysis is that it can be used as both an inductive as well as a deductive technique. In order to answer the research question in Paper 2, it was important to follow an inductive approach. Hence Braun and Clark's (2006) recommended steps were followed in the study. Thematic analysis involves a six-stage procedure: a) familiarisation with the data, b) generating initial codes, c) searching for themes, d) reviewing themes, e) defining and naming themes, and f) producing the report (Braun & Clark, 2006). A theme is any aspect of the data that is important in

relation to the research question. A common hurdle in conducting a thematic analysis is understanding what constitutes a theme. Joffe (2012, p. 209) defined themes as “specific pattern of meaning found in the data”. A theme is usually a pattern noticed in several instances of the data, however, more frequent instances would not indicate importance of a theme. A theme is deemed important if it detects a pattern that is crucial in relation to the research question (Braun & Clark, 2006). The thematic analysis conducted in Paper 2 aimed to identify patterns of hindrances and facilitators of engagement in MBIs.

A common limitation of using thematic analysis is a poorly defined analytic methodology (Braun & Clark, 2006). Hence it is often easy to conduct a poor quality thematic analysis. In order to overcome this limitation, Braun and Clark’s (2006) step-by-step guidance was followed in the analysis.

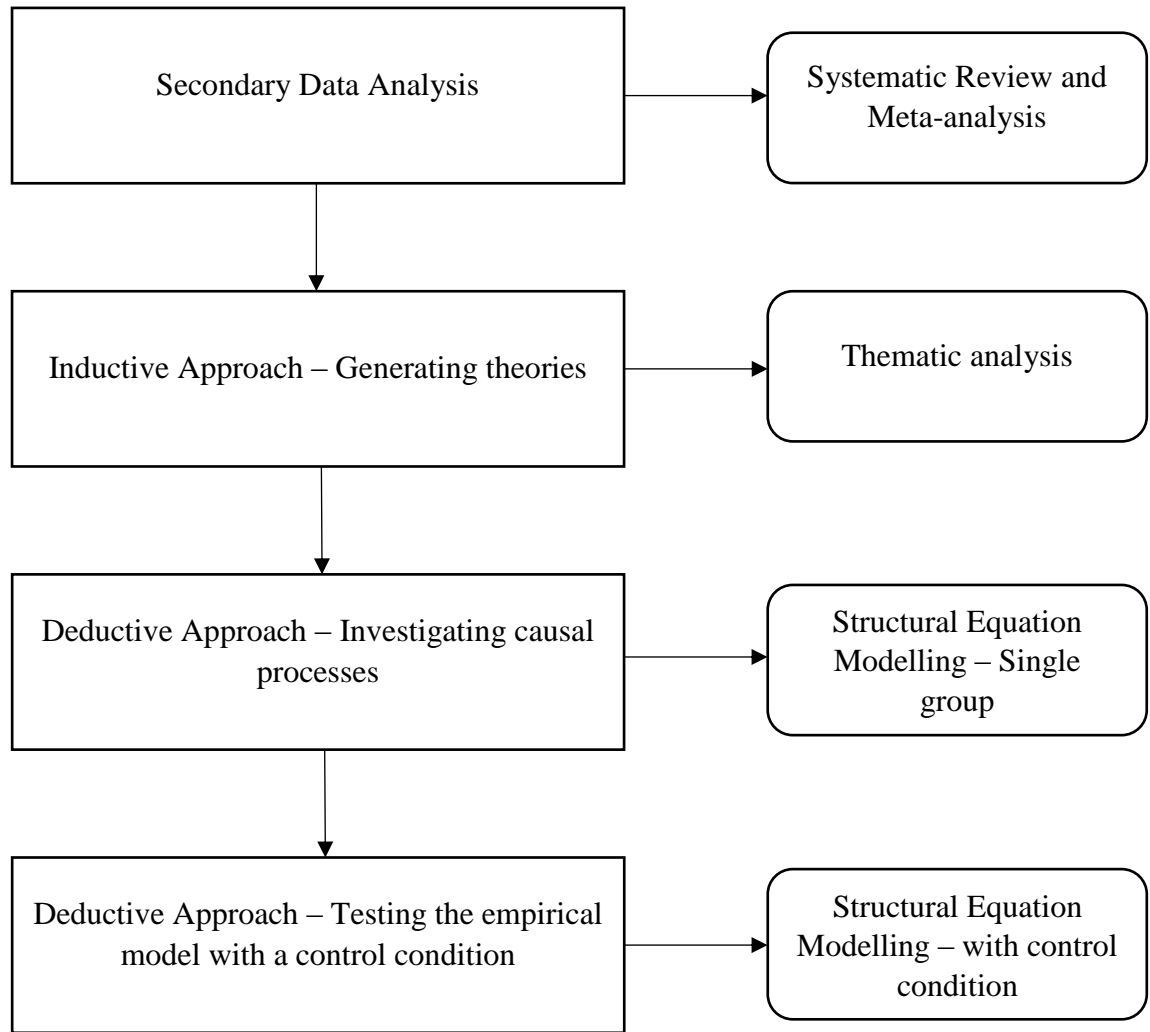


Fig 2.2. Diagrammatical representation of the journey of methodological approached used in the thesis

2.2.3 Deductive Approach – Paper 3 and 4

Having identified emerging patterns through an inductive approach, the next step of research is often deductive, confirmatory methodology of investigation. Contrary to induction, deduction is the mechanism of moving from the theory to a testable prediction or hypothesis (Barker, Pistrang & Elliott, 2015). The final papers (Paper 3 and 4) of this thesis aimed to determine further answers to the research question through

a confirmatory approach based on the theory generated by the inductive qualitative approach in Paper 2.

As noted by Lawson (2015), a confirmatory or hypothetico-deductive method is essentially a method of testing hypotheses or theories and includes sequential processes such as a) developing hypotheses, b) deciding the hypothesis that will be tested, c) predict solutions of the hypotheses, d) experimentally test these predictions and, e) confirming hypotheses if the predictions are true, or alternatively, disconfirming them. It is essential to hypothetico-deductive approach, especially in clinical psychology, in order to make strong conclusions that could influence future research and/or public health. Thus, in order to make robust conclusions based on the theoretical framework developed in Paper 2, it was essential to use a hypothetico-deductive approach.

The methodology selected for these deductive investigations was quantitative survey research, which was statistically analysed using structural equation modelling (SEM). SEM was selected as an appropriate analysis technique due to several reasons. First, SEM uses a hypothesis-testing (confirmatory) approach that can also analyse a structural causal theory and generate results on multiple variables (Bentler, 1988). Second, SEM provides explicit estimates of error variance parameters unlike other multivariate procedures. Finally, no alternative statistical tools allow graphical specification of multivariate models (Cheung, 2015).

Once the model is specified, based on the theoretical knowledge, SEM conducts a goodness-of-fit test between the hypothesized model and the sample data (Byrne, 2013). In this step, fundamentally the researcher applies the structure of the hypothesized structure on the sample data and examines whether or how well the sample data fits the

restricted theoretical model. The difference between the structural model and the sample data is the residual. This has been represented by Byrne (2013) as:

$$\text{Data} = \text{Model} + \text{Residual}$$

Despite the strengths, there are some limitation of SEM. First, like all statistical models, structural models are only approximation of the reality (Tomarken & Waller, 2005). Additionally, often residual terms and covariance terms play an important role in generating an acceptable fit of the model. In order to overcome this limitation a path-by-path analysis was carried out in Paper 4 in order to determine the significance of the difference in the paths of the experimental and control conditions.

2.3 Other methodological decisions

Throughout the process of developing this thesis several important methodological decisions were made. Some of these methodological choices are discussed below.

2.3.1 Risk Ratio

The most significant methodological decision in Paper 1 was selecting the statistical tool to measure effect sizes. The primary question in Paper 1 was to examine the average engagement rate of participants in MBI interventions and to compare these engagement rates with other active treatments. Since engagement is usually measured in terms of dropout, the independent variable was dichotomous. The most commonly used effect sizes measure group contrasts in dichotomous data are risk ratio (RR) and odds ratio (OR). The choice of effect size depends on the aim or the research question and the dependent variable. The RR is the ratio of the risk of an event in the two groups. For example, RR of 2 would mean that the risk of an even in the experimental condition is twice the risk of the event in the control condition. On the other hand, OR is the ratio of

the odds of an event. Both RR and OR are extensively used in clinical research, however, there are some disadvantages of OR. The most frequently noted disadvantage of OR is these are difficult to interpret (Davies, Crombie, & Tavakoli, 1998) and are commonly misinterpreted as relative risks (Schechtman, 2002; Newcombe, 2006). Conversely, RR are easier to interpret. For instance, a RR of 3 for the experimental condition would indicate that the events in this condition is twice more likely than the control condition. Additionally, a recognized problem of OR is that the size of the effect is often exaggerated in comparison to the relative risk (Schechtman, 2002; Newcombe, R. G. 2006; Deeks et al., 1998; Sackett, Deeks, & Altman, 1996). Due to these disadvantages of OR, RR was used in the meta-analysis. RRs are calculated using the following formula:

$$RR = \frac{\text{Event in experimental condition/ Total participants in experimental condition}}{\text{Event in control condition/ Total participants in control condition}}$$

One of the common disadvantages of RR is that it cannot be used for case-control studies (Simon, 2001). However, this is not valid for the current research. Another disadvantage in interpreting RR is that the value of the RR can be the same for different situations in the clinical context. An example of this, reported by Schechtman (2002), is a RR of 0.167 could be an outcome if a) the risk of experimental and control groups are 0.3 and 0.05 respectively, or b) the risk of the experimental and control groups are 0.84 and 0.14 respectively. To avoid this disadvantage, the data from each studies are graphically examined and represented in the paper.

2.3.2 Type of mindfulness intervention

One of the most important methodological decision in this thesis was to focus on examining engagement factors related to mindfulness-based self-help interventions for

the empirical papers. There are several practical and methodological reasons for this decision. First, this decision was pragmatic – self-help mindfulness based interventions are a specific interest of the Sussex Mindfulness Centre, where this program of research was located, and of particular interest to the PhD research supervisors (see Cavanagh et al., 2014; Cavanagh et al., 2013). Self-help MBIs are becoming increasingly popular (e.g. *Finding peace in a frantic world* is an Amazon best seller, Headspace mobile phone application has had over 6 million downloads worldwide). Hence, these methods were chosen to complement supervisor expertise and this contemporary implementation trend. Second, group-based interventions may have several non-specific variable factors that can contribute towards engagement such as, group dynamics (Marziali, Munroe-Blum, & McClearly, 1997) and relationship with the teacher (Barber et al., 2008). However, these factors may vary based on individual predispositions and preferences and may not be relevant to all forms of delivering MBIs. Hence, in order for the results of this thesis to be applicable to all forms of MBIs, only self-help interventions were investigated. Additionally, factors such as group dynamics and relationship with the therapist could artificially inflate engagement levels (Barber et al., 2008). For instance, qualitative studies on MBIs that report the ‘*normalising and supportive process of the group*’ as a theme of participating in an MBI (Wyatt et al., 2014). This could explain why engaging in self-help interventions are considered more challenging (Eysenbach, 2005). Hence engagement in self-help MBIs would be more conservative increasing chances of disengagement, thereby, aiding the examination of the factors related to MBIs. Moreover, by removing these factors that may inflate engagement, self-help therapies could be used for dismantling analysis reporting the factors associated with engaging in mindfulness practice.

Paper 2 investigated factors of engagement in relation to an 8-week self-help MBI, whilst the focus of Papers 3 and 4 was on brief self-help MBIs. This methodological decision was governed by theoretical as well as practical reasons. Since, the aim of the thesis was to investigate the factors that were associated with MBIs in general including mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT) as well as adaptations of these approaches and briefer novel interventions. These MBIs may differ in terms of objective, target participants and techniques (Baer, 2003). The only common element in these interventions is the intention of mindfulness training. It was hypothesised that such as rumination and worry could impede mindfulness training whatever the duration of engagement. Moreover, participant burden afflicts every psychology experiment. Hence in order to reduce participant burden but enable effective investigation of the factors of engagement, brief mindfulness practices were used.

2.3.3 Developing psychological engagement scale

Investigating physical and psychological engagement in MBIs is a conception that is novel to this thesis. Unsurprisingly, measurement scales for this variable proved challenging. However, measuring psychological engagement or involvement in psychotherapy is not a novel concept (see Holdsworth et al., 2014). Hence, several measurement scales have been developed to measure psychological engagement. For instance, the Service Engagement Scale (SES; Tait, Birchwood, & Trower, 2002), the Treatment Engagement Rating (TER; Drieschner & Boomsma, 2008) and the Client Evaluation of Self and Treatment (CEST, Joe et al., 2002). Both SES (Tait et al., 2002) and TER (Drieschner & Boomsma, 2008) are only applicable for engagement in community mental health services and forensic settings respectively. These scales are constructed to be used by the therapists to account their perception of the participants'

engagement level. Hence, these could not be used for the current self-report study. CEST (Joe et al., 2002), on the other hand, was developed specifically for drug-abuse treatment programs and measures engagement in terms of participation, treatment satisfaction and counselling rapport. Items on the participation subscale include items such as, “*You are willing to talk about your feelings during counselling*” and hence were more applicable to face-to-face interventions.

A common practice in the absence of a measurement scale suitable for the research question is to develop a new measurement scale. For instance, Nelson and Borkovec (1989) used participants' self-rated engagement level as a measure of engagement. Systematic reviews in the field of therapeutic engagement have pointed out that psychological engagement or involvement is usually measured through proxies such as, motivation, intent, belief and commitment (Holdsworth et al., 2014, Tetley et al., 2011). Since no suitable engagement scale could be identified, these proxies were used to develop a psychological engagement measure of MBIs. The items were [*over the past two weeks*], *how motivated were you to set time aside to use the mindfulness online course?* (motivation); *how likely do you think you are to engage in mindfulness?* (intent); *how effective do you think mindfulness is in helping to deal with stressful situations?* (belief); *how often did you bring mindfulness principles into your life each day?* (commitment); *how engaged overall have you been with the mindfulness online course?* and *how satisfied are you with mindfulness online course?*

The primary disadvantage of developing new measures is the lack of understanding of the reliability of the scale prior administering the scale. Moreover, an important limitation in the psychological engagement scale is the lack of psychometric analysis conducted in developing the scale (section 2.3.4. highlights future recommendations for developing a psychological engagement scale for MBIs).

However, since the proxies used to measure engagement were closely associated with the concept psychological engagement and were derived from reviews on the literature of engagement in psychotherapy, our scale appeared to be suitable for the current studies. Administration of this scale in the first study revealed a very high reliability score ($\alpha = 0.82$). This indicated that the items in this scale were measuring the same construct. Additionally, the high correlation of the psychological engagement and increase in trait mindfulness supported the validity of the scale.

2.3.4 Recommendations for development of psychological engagement scale for MBI

Due to unforeseen circumstances, the psychological engagement scale could not be developed through rigorous psychometric processes. It has been recommended that the process of generating a questionnaire must be inductive (Gillham, 2007). Gillham (2007) suggests that this process begins with first developing the broad aims of the questionnaire, followed by generating specific research questions. It is often suggested that literature reviews on the topic could be used to start generating these questions (Fayers & Machin, 2000). The process of generating initial ideas on sample questions has two main stages – focus group discussions followed by semi-structured interview (Gillham, 2007). In order to conduct these interviews, it is also essential to determine the sample that is representative of the population of interest (Gillham, 2007).

Qualitative analysis, such as content analysis, can then be conducted on the interviews in order to generate preliminary items (Gillham, 2007). This process could be followed by quantitative analysis, such as factor analysis, to finalise the items to be used in the questionnaire (Gillham, 2007). This could be followed by validity and reliability checks for the questionnaire. It is recommended that future research follows a more methodical procedure for developing a psychological engagement questionnaire.

2.4 Conclusions

“... scientific methodology is seen for what it truly is – a way of preventing me from deceiving myself in regard to my creatively forms hunched which have developed out of the relationship between me and my material.”

– Carl Rogers (1955, p. 275)

In conclusion, this thesis attempted to use multiple approaches to answer the research questions outlined in chapter 1. In order to use an expansive, inclusive and pluralistic form of research (Johnson & Onwuegbuzie, 2004), mixed methods was used to answer the research questions. This approach may be criticised as it may sometimes, result in inconclusive solutions, especially in case of contradictory results (Johnson & Onwuegbuzie, 2004). Hence studies in this thesis used distinct methodological approaches suitable to draw firm conclusions. Every step in the development of this thesis was a part of the research cycle (see Fig. 2.1). Since flexibility of ideas and methodologies is a prerequisite of a good quality research (Barker, Pistrang & Elliott, 2015), the methodological decisions were made after considering several alternatives. However, the common themes in making these methodological decisions were based on research question of the particular study and the overall aim of the thesis or the ‘bigger picture’. Some of these methodological decisions may have been improved with hindsight (see limitations sections in the individual study papers), however, as aptly put by Rogers in the earlier quotation, the research attitude must be preventing one from deceiving oneself from drawing conclusion that is not backed with empirical findings.

Chapter 3: Engagement in Mindfulness-based Interventions: A Systematic Review and Meta-analysis

Abstract

Background: Mindfulness based interventions (MBIs) have developed status as effective and popular interventions in mental health care, but engaging in mindfulness may be challenging. Limited research has explored participant engagement and retention in MBIs.

Aims: The present meta-analysis examined the mean dropout rate, risk ratio of dropout from MBIs and factors associated with this.

Method: Randomized control trials (RCTs) comparing MBIs with active intervention control condition for adults with a DSM or ICD diagnosis of a mental health disorder were included. Mean dropout rates and risk ratio were computed and effect of moderators was explored. Reasons of dropout were explored.

Results: 10 RCTs with a total of 857 participants were included. The weighted mean dropout rate from the MBI arm of the studies was 22.24%. Dropout risk was slightly lower in MBI arm of the study compared to other active interventions (Risk Ratio = 0.96); however, the comparison between these conditions was not statistically significant. Dissatisfaction from the intervention was the most frequently reported reason for dropping out of MBIs. Dropout rates from MBSR groups were higher than MBCT groups and dropout rates of participants with active mental health condition were higher than those in remission. However, none of these differences were significant and must be interpreted with caution.

Conclusion: These findings suggest over one in every five participants are likely to drop out of MBI arms of RCTs. A small number of available studies stress the need of more studies comparing MBIs with active intervention conditions. Suggestions are made on ways to improve engagement in MBIs in research studies and in the outpatient setting.

Keywords: Engagement, Dropout, Attrition, Meta-analysis, MBCT, MBSR.

3.1 Introduction

Mindfulness is a process of bringing intentional and non-judgmental attention to experiences in the present moment (Kabat-Zinn, 1990). Mindfulness training has been integrated into psychotherapeutic approaches, in particular, through mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT), with both interventions consisting of two to three-hour group classes typically delivered over 8 weeks. Other interventions, such as, dialectical behaviour therapy (DBT) (Linehan, 1993), acceptance and commitment therapy (ACT) (Hayes, 1994), attentional control therapy (McMillan, Robertson, Brock, & Chorlton, 2002), mindfulness-based eating awareness training (MB-EAT) (Kristeller & Hallett, 1999) and person-based cognitive therapy (PBCT) (Chadwick, 2006) have incorporated mindfulness techniques however, MBSR and MBCT are considered as the two forms of psychological interventions that are predominantly based on mindfulness and adopts similar length of mindfulness exercises (Baer, 2003). Hence, only MBSR and MBCT have been included in MBIs in this paper (see section 1.1.4 for detailed rationale). In the last twenty years such mindfulness based interventions (MBIs) have been the focus of substantial research attention.

There is evidence from meta-analyses of randomised controlled trials that MBIs can be effective at improving mental health and wellbeing in mental health in clinical (Hofmann et al. 2010), and non-clinical (Khouri, Sharma, Rush, & Fournier, 2015) populations. The strongest evidence is for MBCT, where a recent meta-analysis found that MBCT, in comparison to anti-depressant medication, can reduce the risk of relapse for people who are currently well with a history of multiple episodes of depression (Kuyken et al., 2016).

However, in addition to the potential clinical benefits of an intervention for those who complete it, a critical factor for real world implementation is engagement in the intervention. Disengagement from an intervention or 'dropout' is regarded as an expression of dissatisfaction with care and it also, unsurprisingly, reduces overall intervention efficacy (Deyo & Inui, 1980; Davis, Hooke & Page, 2006). A recent meta-analysis of dropout from psychotherapies including cognitive-behavioural, integrative, psychodynamic psychotherapy, solution-focused therapy and supportive/client-centered therapy reported an average dropout rate of 20%, which indicates one in every five participants dropped out from psychotherapy prematurely (Swift & Greenberg, 2012). However, this dropout rate varied substantially depending on the intervention settings (university-based clinics, experienced the highest average rates of dropout of 30.4%). The dropout rate from outpatient hospital practice was around 23% while that from research settings was the lowest (17%). High dropout rates from psychological interventions have resulted in the growing research attention towards treatment engagement.

Disengagement is often a result of patients believing that they are either not improving or improving more slowly than they expected (Davis et al, 2006). Dropout from psychological interventions can result in service costs, denial of the service to others who could have used it, reduced staff morale and interruption of therapy groups (Pekarik, 1985). Reduced staff morale and interruption of therapy groups might, in turn, affect the efficacy of the therapy for even those who complete it. Dropout is hence recognized as an important barrier in delivering psychotherapy effectively (Wierzbicki & Pekarik, 1993). Thus a key method of improving intervention outcomes may be to focus on increasing engagement.

Several reviews have been conducted aiming to understand the factors associated with disengagement from psychotherapy. One early review found that demographic factors

such as younger age, lower socio-economic status and greater symptom severity correlated with higher treatment dropout (Deyo & Inui, 1980). However, other meta-analyses have reported no such relations (Pekarik, 1985; Wierzbicki & Pekarick, 1993). Dropout has also been associated with longer duration of therapy, and discrepancies in participants' expectations and actual therapy content is associated with increased dropout risk (Pekarik, 1985). A further systematic review reported dropout to be associated with experiential factors such as, previous experience of the intervention and poor therapeutic alliance resulting in higher dropout rates (McMurran, Huband & Overton, 2010). Experience of the therapist has also been reported as a factor associated with engagement in treatment (Delk & Johnson, 1975). These factors may thus be broadly classified as participant-related, therapy-related and therapist-related factors. However, despite increased interest in MBIs in recent years, relatively little is known about how these factors may influence engagement with these particular interventions.

Engaging with MBIs may be particularly challenging for people experiencing mental health problems. There are three main reasons why people experiencing mental health problems might find it difficult to engage with MBIs. First, people with mental health problems such as depression or anxiety are likely to experience negative thoughts and feelings (Teachman, Joorman, Steinman & Gotlib, 2012). Mindfulness practice, which encourages noticing of current experiences, may be difficult to tolerate in this context. Second, becoming preoccupied with negative thoughts and feelings is characteristic of depression and anxiety, for example in the form of rumination, worry and catastrophizing (Hong, 2007; McLaughlin & Nolen-Hoeksema, 2011). Such repetitive thinking styles are in conflict with the "being mode" of mindfulness, and there may be a risk of being drawn into rumination, worry or catastrophizing during periods of silent mindfulness practice. Third, motivational and cognitive challenges associated with mental health problems

(Joorman & D'Avanzato, 2010) may hinder participation in lengthy, daily mindfulness practices.

Despite these potential threats to engagement, research investigating dropout from MBIs for people with mental health problems is in its infancy. A randomised control trial (RCT) of participants with at least one episode of major depressive disorder (MDD) reported a 30% dropout from MBCT (Crane & Williams, 2010). Completers were significantly younger and less likely to be on antidepressants than those who dropped out. The study also found that individuals with high levels of brooding and cognitive reactivity found it more difficult to engage with the intervention. Each of these factors may be important to develop an understanding of engagement and dropout from MBIs.

In spite of the relevance to clinical practice, to date no published meta-analysis investigates the extent of engagement in MBIs of people with mental health problems. There is also paucity of research on the factors associated with dropout and the risk of dropout from MBIs in comparison to other interventions. The aim of the present study was to explore dropout rates from MBIs in research studies, and to compare these with other therapies by examining the risk ratio of dropout from MBIs compared to active control conditions. It is predicted that being a group approach, the dropout rate from MBIs is likely to be lower than individual interventions, as has been seen in previous research (Hans & Hiller, 2013). In order to address reported difficulties on studying dropout due to methodological variations in MBIs, the focus of this meta-analysis will be RCTs of mindfulness-based stress reduction therapies (MBSR) and mindfulness-based cognitive behavioural therapies (MBCT). Although other interventions include elements of mindfulness practice and principles, MBCT and MBSR are predominantly based on the principles and practice of mindfulness and have an analogous method of delivery (Baer, 2003). Hence only these two interventions were explored in the current meta-analysis and

will be referred to as mindfulness-based interventions (MBIs). Moderation effects of participant-related, therapy-related and therapist-related characteristics were also planned.

3.2 Method

The study was conducted following the PRISMA statement, which provides a detailed guidance of preferred reporting style for meta-analyses (Moher, Liberati, Tetzlaff and Altman, 2009).

3.2.1 Literature Search

Electronic databases (Scopus, PsycINFO and Web of Science) were searched to find study titles and abstracts published on or before March 2014, using keywords ‘mindfulness-based stress reduction’ or ‘MBSR’ OR ‘mindfulness-based cognitive therapy’ or ‘MBCT’. Clinical trials registers and other sources of potentially unpublished studies were not explored in order to be confident in the rigor of reported engagement data and so this study focused solely on studies published in peer-reviewed journals.

3.2.2 Inclusion criteria

The following *a priori* criteria were set for including studies in the current meta-analysis.

Type of studies: Randomized controlled trials of MBSR or MBCT with an active intervention control condition published in peer-reviewed journals. Active intervention condition was defined as any psychosocial intervention that required therapeutic engagement beyond usual care.

Type of participants: Adult participants diagnosed with an axis I disorder according to the *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (DSM-IV) or the *Diagnostic and Statistical Manual of Mental Disorders*, 3rd edition revised (DSM-III-R)

or the *International Classification of Diseases and Related Health Problems*, 10th edition (ICD-10) classification system. Studies with participants experiencing active disorders and disorders in full or partial remission were included as this is particularly relevant to MBCT.

Type of data: Studies included were required to have sufficient information on patient flow to enable calculation of dropout from both arms of the study. If this was not available in the published paper the corresponding author was emailed. Dropout refers to intervention drop-out (i.e. participants who failed to attend at least 50% of intervention sessions; Teasdale et al., 2004). However, where this was not available study drop out was used as a proxy for intervention drop out¹. Study drop out refers to the number of participants failing to complete post-intervention assessment. On extracting the eligible studies, it was observed that none of the studies reported information on dropout from the intervention, hence only study dropout could be used for the analyses.

3.2.3 Data Extraction

A data extraction sheet was created to code dropout details (including total number of participants in each study arm and number of dropouts from each arm), group characteristics (including interventions and comparison conditions), participant-related characteristics (age mean, gender percentage, educational level, socio-economic status, marital status, ethnicity, duration of disorder, number of prior episodes, co-morbidity and medication history) intervention-related characteristics (including, number of week of therapy, length of each class, homework hours and group size), therapist-related characteristics (experience of practicing mindfulness and experience of teaching

¹ This may include participants who engaged in the intervention but failed to complete the post-intervention assessment. Conversely, participants who failed to complete the intervention (i.e. attending <50% of sessions) but who did complete post-intervention assessments would not be counted as dropping out. Study drop out therefore only provides an approximation for intervention drop-out but is used in cases where intervention drop-out data is not available.

mindfulness) and primary study outcomes (effect size). Any reported data on reasons for dropout were also extracted.

3.2.4 Methodological quality of studies

The methodological quality of the studies was assessed by the first author using the Jadad criteria (Jadad et al, 1996): a) the study was described as randomized, b) the randomization procedure was described and appropriate, i.e., study participants were randomly allocated independent of the investigators by methods “allowing each participant to have the same chance of receiving each intervention” (Jadad et al., 1996, p. 9), c) blind outcome assessments were reported (blindness of participants and therapists, as required by the original Jadad criteria, are not possible), d) number and reasons of withdrawals and dropouts were provided for each group. One point was assigned for each of the four fulfilled criteria, constituting a maximum Jadad score of 4 points.

3.2.5 Statistical Analysis

Meta-analysis was planned on the selected studies comparing dropout rate from MBIs and active treatment control conditions.

Due to the lack of information on dropout from intervention in the studies, dropout refers to participants who failed to provide post-intervention data. This includes participants who refused the intervention, did not follow intervention protocols or were not available to provide post-intervention assessment data.

The proportion of participants dropping out of the MBI conditions and the proportion of participants dropping out of the control conditions were subjected to a risk ratio (RR) meta-analysis, using a Mantel–Haenszel random effects model, weighted by sample size, with a 95% confidence interval. Results were calculated using the software package Review Manager 5 (Cochrane, 2008). RRs were calculated using the following formula:

$$RR = \frac{\text{MBI dropout}}{\text{MBI total}}.$$

Control dropout/ Control total

Hence RR of 0.5 would indicate participants in the MBI arm of the study are half as likely to drop out from the study compared to the active control condition.

The inverse variance random-effects model was followed for all analyses as they take heterogeneity among studies into account (Higgins, 2008). In order to account for the difference in the sample size of each of the studies, risk ratios were attributed weights. Since smaller sample sizes yield less accurate estimates of the effects found in the population compared to larger sample sizes, they were attributed a smaller weight. Study heterogeneity was assessed by using the Higgins I^2 tests. Significance levels of $p < .05$ were set *a priori* to assume the presence of heterogeneity. An I^2 value of 0% indicates no heterogeneity, while 25%, 50% and 75% denote low, moderate, and high heterogeneity respectively.

3.2.6 Moderation Analysis

Proportion of dropout was the primary effect size used for the within group meta-regression analysis. Similar to risk ratios, proportions were also weighted for the sample size in order to achieve closer estimates of the population. The mean proportion of dropout was calculated. Restricted maximum likelihood methods were used to explain the variation in the studies. The association of the sample variables with the proportion of dropout was examined. In the case of small sample sizes, variables with missing values would not be included in the meta-regression analysis. The sample variables included demographic characteristics (age and gender); diagnostic characteristics (current mental health condition, diagnosis) and intervention characteristics (intervention type and study effect size) and therapist characteristics. SPSS was used to run Wilson's macros for meta-F analysis for categorical study variables and meta-regression for continuous study variables (Lipsey & Wilson, 2001).

3.3 Results

The full flow of information from identifying the study to including the study in the current meta-analysis is reported in Fig. 3.1 (N refers to the number of studies, n to the number of participants).

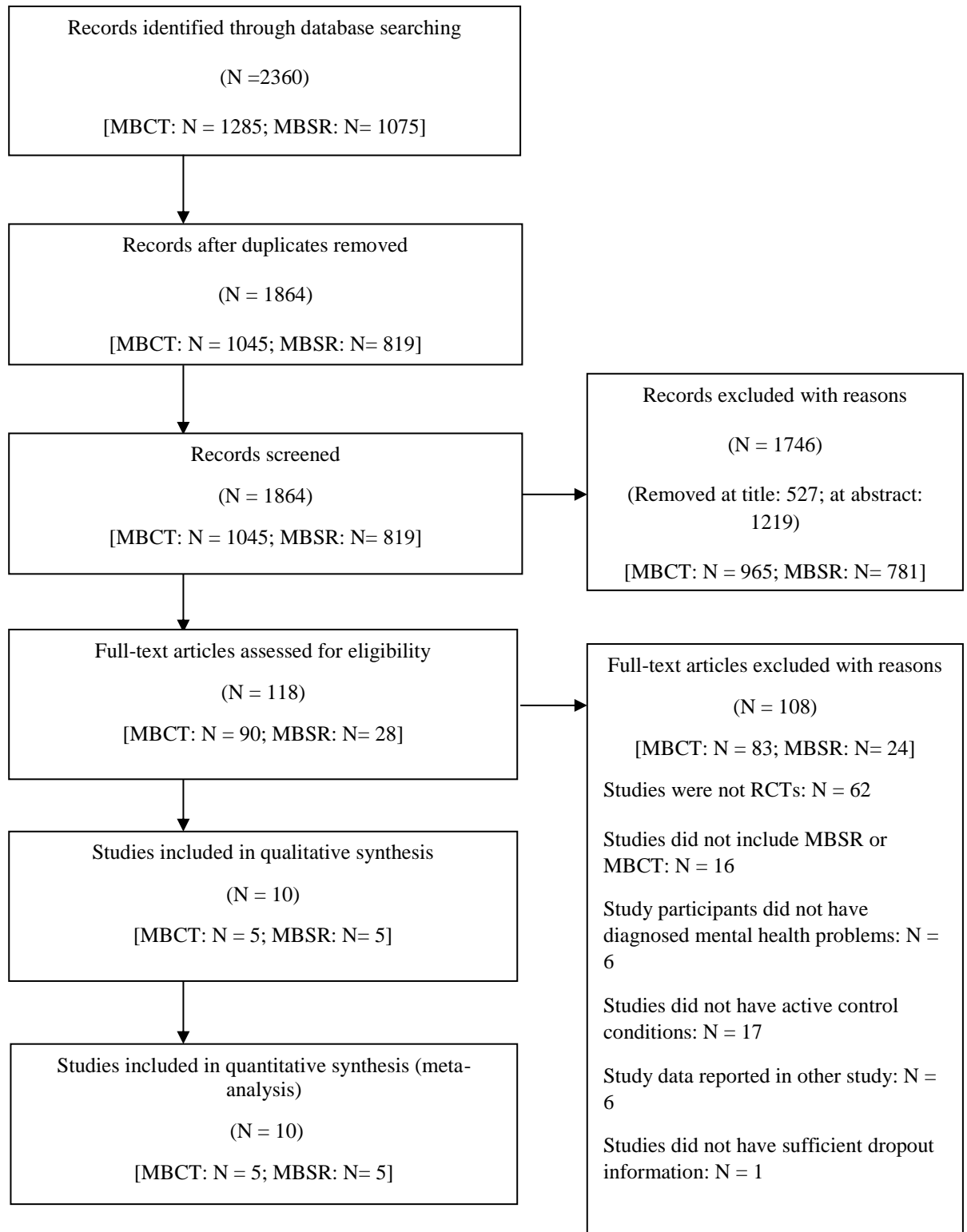


Fig. 3.1 Flow diagram of information from identification of study to its inclusion

3.3.1 Characteristics of the studies

The 10 eligible studies are summarised in Table 3.1. The total number of participants in the studies was 857, with the mean of mean study ages being 41.26 years (ranging from 21 to 49 years), 58.13% participants were women. Five studies (Arch et al, 2013; Gross et al, 2011; Hoge et al, 2013; Jazaieri et al, 2012 and Koszycki, Bengner, Shlik & Bradwejn, 2007) compared MBSR to an active control condition, the rest examined MBCT. Some papers from the same study were published as multiple papers investigating specific aspects of the intervention (Jazaieri et al, 2012 *same study as* Goldin, Ziv, Jazaieri & Gross, 2012 and Goldin, Ziv, Jazaieri, Hahn & Gross, 2013; Manicavasagar, Parker & Perich, 2011 *same study as* Manicavasagar, Parker & Perich, 2012, Perich, Manicavasagar, Mitchell & Ball, 2011 and Perich, Manicavasagar, Mitchell, Ball & Hadzi-Pavlovic, 2013; Kuyken et al, 2008 *same study as* Kuyken et al, 2010). In order to avoid duplication, one paper was from each study for the meta-analysis. The paper was selected on the basis of dropout information available and primary outcome of the paper.

Only some papers reported information on intervention drop-out from both study arms (defined here as failing to attend at least 50% of intervention sessions) (see section 3.3.3) and information on intervention dropout was not available from authors of the other papers. In all cases, as outlined in the Methods section, study drop-out was used as a proxy for intervention drop-out.

The methodological quality of the studies was assessed using the Jadad criteria which ranged from 2 to 4 (median=4).

Table 3.1 Characteristics of studies comparing MBIs with active controls.

Study	Intervention	Control	Participants	Gender (% Female)	Age (Mean)	Effect Size (<i>Cohen's d</i>)	MBI class hours	Number of Weeks	JADAD score
Arch et al, (2013)	Adapted MBSR	CBGT	One or more DSM-IV anxiety disorders	21.43	46.48	-0.05	1.50	10	4
Bieling et al, (2012)	MBCT	a: PLA+clin b: ADM	Recurrent MDD (2 or more previous episodes), currently in remission for at least the last 5 months	50	44.8	-0.48	2.00	8	4
Gross et al, (2011)	MBSR	Pharmacothera py (PCT)	Chronic primary insomnia	75	47 (median)	0.25	2.50	8	4

Hoge et al, (2013)	MBSR	Stress Management Education (SME)	Generalised Disorder (GAD)	Anxiety	48	41	-0.37	2.00	8	4
Jazaieri et al, (2012)	MBSR	AE	Social anxiety disorder (SAD)		61	32.8	-0.25	2.50	8	4
Koszycki et al, (2007)	MBSR	CBGT	SAD		62	38.9	0.85	2.50	8	2
Kuyken et al, (2008)	MBCT	ADM	Recurrent Depression (3 or more episodes), currently on ADM		77	48.95	1.07	2.00	8	4

Manicavas agar et al, (2011)	MBCT	CBGT	Current episode of MDD	37	47	-0.16	2.50	8	4
Piet et al, (2010)	MBCT	CBGT	SAD	79	21.6	0.20	2.00	8	3
Williams et al, (2014)	MBCT	Cognitive Psychological Education (CPE)	MDD (3 or more previous episodes), currently in remission	71	43.9	-.11	2.00	8	4

Note: MBCT: Mindfulness-based cognitive therapy; MBSR: Mindfulness-based Stress Reduction Therapy; CBGT: Cognitive Behavioural Group Therapy; AE: Aerobic Exercise; Med: Medication; PLA+clin: Placebo + clinical management; MDD: Major depressive disorder. Studies marked with * followed the *Diagnostic and Statistical Manual of Mental Disorders*, 3rd edition revised (DSM-III-R) classification.

3.3.2 Effect Size: Risk Ratio

The comparison of the MBI condition to the active control condition revealed a RR of 0.96 (95% CI [0.68, 1.35], $z=0.26$, $p=.80$) (Fig. 3.2) in favour of the MBIs. This result is not statistically significant and there was substantial variation in the interventions used in the control conditions. To reduce this variation, MBIs were compared to CBGT, which is also a group based therapy delivered weekly. Only four studies compared MBIs ($n=70$) with CBGT ($n=78$). Results revealed a similar dropout risk ratio of 0.90 (95% CI [0.481, 1.70], $z=0.31$, $p=.75$) was found in favour of MBI. This result indicates participants are slightly more likely to dropout from CBGT than MBIs; however, this was not statistically significant.

There was substantial variation in the interventions in the control arms of the studies. To reduce this variation, a sensitivity analysis was conducted whereby only studies comparing MBIs to group cognitive behaviour therapy (CBT) – a group-based therapy delivered weekly – were included in the analysis. Only four studies compared MBIs ($n=70$) with group CBT ($n=78$).

Results revealed a similar dropout risk ratio of 0.90 (95% CI [0.481, 1.70], $z=0.31$, $p=.75$) was found in favour of MBI. This result indicates participants are slightly more likely to dropout from group CBT than MBIs; however, this was not statistically significant.

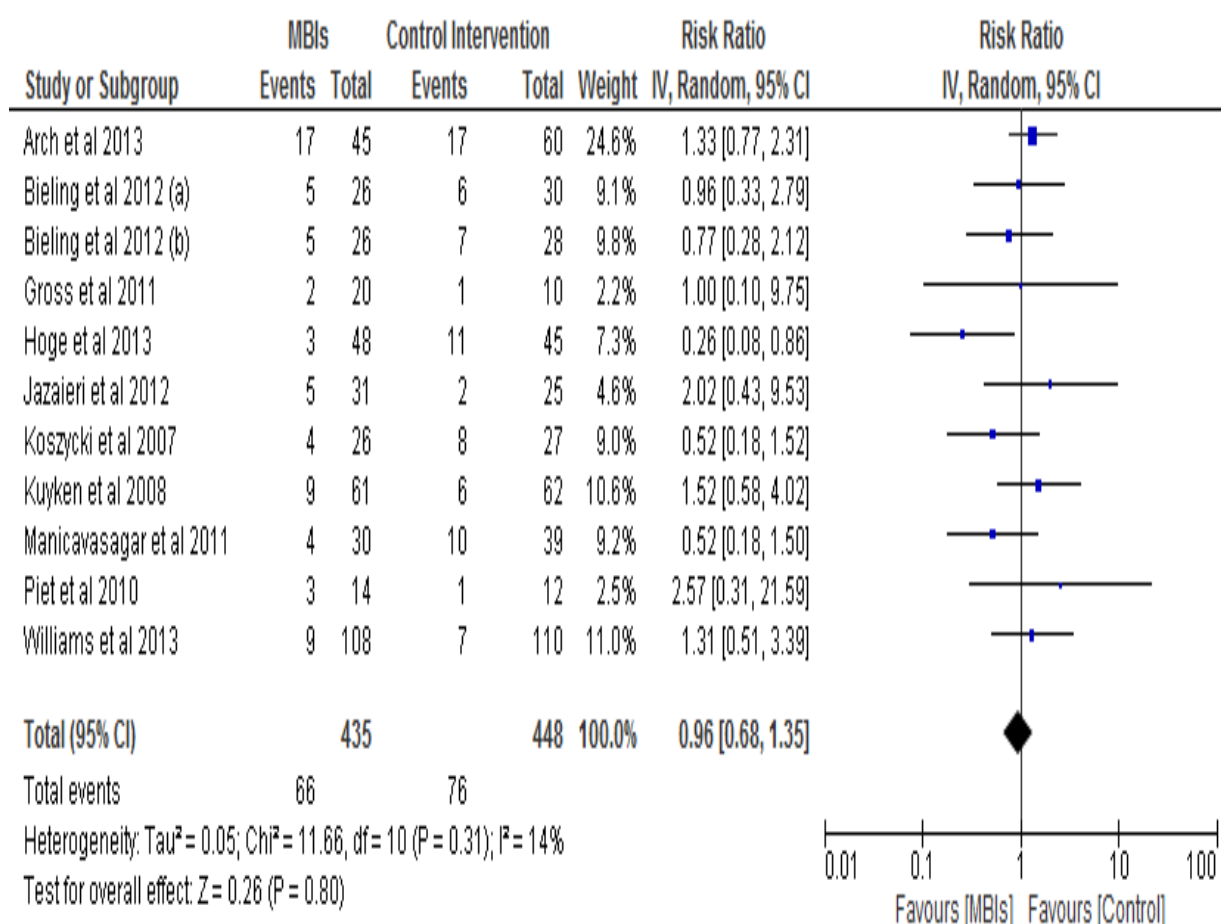


Fig. 3.2. Comparison of risk of dropout between MBI and control conditions.

Note: From left, the first column shows studies included (names of author and year of publication). The next columns specify the number of dropouts (events) and total number of study participants (Total). The column marked “Weight” indicates the weight designated to each individual studies, considering the sample size of the study. The next column named for Risk Ratios (RRs) indicates the relative risk of dropout from MBIs and controls, along with the confidence interval. A RR of less than 1 is in favour of MBIs meaning dropout from MBIs was less. The size of the squares on the lines shows the sample size of the study. The overall results are recorded in the bottom row.

3.3.3 Description of dropout: Systematic Review

For a better understanding of why participants might drop out of MBIs, reported reasons for dropout were coded. Papers lacked a standardized reporting format describing the reasons of dropout. Three papers (Bieling et al, 2012; Gross et al, 2011; Hoge et al,

2013) did not provide any reasons of dropout. Two papers (Manicavasagar et al, 2011; Williams et al, 2014) only described the demographic characteristics of the all the participants who dropped out. One paper (Arch et al, 2013) described dropout in two categories, i.e., “participant moved out” and “unable to make contact or did not respond to attempted contact”. Only three studies (Jazaieri et al, 2012; Koszycki et al, 2007; Piet, Hougaard, Hecksher & Rosenberg, 2010) reported a full range of reasons for dropout (MBI: n=14, group CBT: n=7, Aerobic Exercise; AE: n=2).

In these three studies drop out from MBIs were primarily for intervention-related reasons. Dissatisfaction with the intervention constituted 67% of dropouts from MBIs (n=8) while time commitment constituted 33% of dropouts (n=4). Contrastingly, the most common reason for not attending group CBT sessions was time commitment constituting 89% of total dropouts (n=8) and only 11% (n=1) dropped out due to dissatisfaction with the intervention itself. Of the two participants who dropped out from the AE condition, 1 participant had a schedule clash and 1 participant was too anxious to attend the gym. Numbers in each cell are too low to warrant statistical analysis of reasons for dropping out between MBIs and control conditions and the small number of participants in each cell mean that these findings should be interpreted with caution. However, they point towards intervention-related reasons being given as reasons by some participants for dropping out of MBIs.

3.3.4 Moderation analyses

Proportion of dropout was the primary effect size used for the meta-regression analysis. The pooled mean proportion of dropout was 0.22 (95% CI [0.001 to 0.44], $p=0.05$). There is no evidence of heterogeneity among the studies ($Q=1.11$, $p = 0.99$), although the Q statistic is liable to false negatives where there are only a small number of studies, as in the current study.

Due to the small number of studies only the variables that were reported by all the studies were analysed.

The variables selected for examining moderating effects of MBI class characteristics on MBI drop out were: number of weeks of the intervention ($\beta = -.13$; $p=.62$), length of each class (hours) ($\beta = -.03$; $p=.97$), homework hours ($\beta = -.09$; $p=.62$) and group size ($\beta = .06$; $p=.45$). None of these variables had significant associations with MBI dropout.

Table 3.2 shows the moderating effect of demographic characteristics (age and gender); diagnostic characteristics (current mental health condition, diagnosis) and intervention characteristics (intervention type and study effect size) on MBI drop out. These were analysed using Wilson's meta-F (for categorical variables) and meta-regression (for continuous variables). None of these moderation analyses were statistically significant (dropout from MBSR =29% and MBCT =14%; drop out if experiencing a current mental health condition=29% and for participants in remission=14%).

Only three papers reported data on therapist experience of practising mindfulness and teaching MBIs. Hence no analysis was done on the potential moderating effects of therapist- related characteristics.

Table 3.2: Results from meta-analyses

Group	Mean RR	SE	−95% CI	+95% CI
MBSR	0.77	0.80	0.66	2.83
MBCT	1.04	1.03	0.71	3.14
In Remission	1.05	0.80	0.66	2.83
Active Diagnosis	0.75	1.03	0.71	3.14
Depression	0.94	0.96	0.70	3.05
Anxiety	0.88	0.88	0.72	3.07
Control: Medication	1.56	0.64	1.01	4.05
Control: Psycho-social				
Intervention	1.03	1.02	0.56	2.58

Note: Mean RR: Mean Risk Ratio; SE: Standard Error; CI: Confidence Interval

3.4 Discussion

The overall mean study dropout from MBI arms of RCTs was 22.24% which means that over one in every five people with a mental health problem drops out of the MBI arm within an RCT. This rate of dropout is similar to study dropout rates reported in individual therapy arms within RCTs (e.g. mean dropout of 16.1% for 26 RCTs of CBT, 15.4% for 13 RCTs on ACT and 27.1% for 13 RCTs on DBT) (Ost, 2008).

The risk ratio of dropout from MBIs was not significantly different from the active intervention control conditions (RR = 0.96; 95% CI [0.68, 1.35], $z=0.26$, $p=.80$). This may be due to the small number of studies comparing MBIs with active controls lowered the power of the test. Additionally, the ten studies included a variety of control interventions with strikingly different approaches with diverse definitions of dropout. Thus methodologically it is difficult to draw strong conclusions as some comparison therapies did not involve being a part of groups (e.g. clinical management), while some did (CBGT).

To address the issue of diversity in types of active interventions, a sensitivity analysis compared the dropout odds from MBIs and group CBT. Only four studies compared MBIs to group CBT. The analysis showed no significant differences between drop out from the MBI arm of trials (24.35%) and group CBT comparison arms (26.08%).

Results suggest that MBIs may be difficult to engage with for some people experiencing mental health problems as more than one in five participants dropped out from the MBI arm in the RCTs included in this study. There was some indication that drop out from MBIs may be attributable in some cases to intervention-related reasons. Only three studies ($n = 135$) reported reasons for drop out ($n = 23$). The most common reason for dropping out from MBIs was dissatisfaction with the intervention (67% of the total number of people in the MBI arm of these studies). This result is consistent with previous studies reporting the two common reasons for dropping out of MBCT were difficulty in understanding the rationale and expectations of meditation and time commitment (Langdon, Jones, Hutton & Holtum, 2011). A recent review suggested that participants could be provided information on what to expect and strategies to respond if disconcerting emotions arise during the intervention (Dobkin, Irving & Amar, 2012). Findings such as these emphasize the need for further research in this area to better

understand participants' potential dissatisfaction with MBIs. If dissatisfaction/difficulty with the intervention itself is a key reason for dropping out it is important to understand the nature of this dissatisfaction/difficulty in more detail (perhaps through further qualitative studies). This may help to refine MBIs to help to reduce dropout and to focus the intervention more appropriately.

The moderation analyses revealed no significant differences between the groups compared. This may be due to the study being underpowered for moderation analyses. Future studies could examine the moderating effects of the tested variables with more RCTs studies on MBIs. The moderation analyses in the current paper was limited by the variables tested and reported in the studies included in the analyses. Although research on the factors that may moderate engagement in MBIs is in its infancy, however, there are some studies that highlight the possible moderators of engagement. Brooding (a form of rumination) and higher levels of depressive rumination have been associated with dropout from face-to-face MBCT groups (Crane & Williams, 2010). A perseverative thinking style that is similar to rumination (Watkins et al., 2005) could moderate engagement in MBIs. Qualitative analyses on the experience of participating in MBIs have reported that detaching observation from the content of thoughts to the awareness of thoughts is often described as one of the most 'uncomfortable experiences' (Wyatt et al., 2014, p. 223). Moreover, a grounded theory on mindfulness practice reported that one of the main reason participants disengaged was the urge to "do" rather than to "be" (Langdon et al. 2011). These results indicate that perseverative thinking styles could moderate disengagement from MBIs.

An important research gap noted in this meta-analysis was the paucity of studies reporting intervention dropout. In order to overcome this limitation in the literature, study dropouts were used as proxy measures. However, it must be noted that study dropout may

be a construct that is completely independent of intervention dropout. For instance, participants may engage completely in the intervention but not provide post-intervention data or vice versa. Hence it is not possible to draw conclusions on engagement in MBIs from study dropout data. Thus, in order to develop the science of engagement in MBIs, it is important to explicitly report data on intervention and study dropout separately.

3.4.1 Limitations

The studies reported in the current meta-analysis had several limitations. The studies did not report therapy dropout and so in this meta-analysis study dropout (failure to provide post-intervention data) was used as a proxy for therapy dropout. Moreover, reasons for dropout were reported in very few studies.

The current study reports dropout rate from RCTs only to allow a direct comparison in drop out between MBIs and active intervention control conditions. However, drop out may be lower in RCTs than in routine clinical practice. A recent RCT (Crane & Williams, 2010) for example reported when a participant failed to attend one MBCT session, therapists made attempts to make contact with them by telephone, email or even letters in order to retain them. Materials were also sent by post to help them engage in the therapy at home. These dedicated retention efforts, typical in RCTs, may not be possible within routine clinical setting. Hence, the dropout rate from MBIs in an outpatient setting may be expected to be higher, and in line with this, dropout of up to 42% has been reported from outpatient MBCT groups (Green & Bieling, 2012).

The search strategy included only peer reviewed papers. This was done as a way of ensuring rigor of trial reporting, however it may have led to publication bias as studies with poorer outcomes (and higher rates of drop out) may be less likely to publish findings (Turner, 2013). Additionally, the Jadad ratings were not verified by a second rater. Moreover, studies with less than three Jadad points were included in the review, which is

not recommended (Simon, 2006), however given the relatively small number of studies in the current study it was decided not to reduce this further by removing lower quality studies.

3.4.2 Clinical and research implications

This meta-analysis found rates of drop out from the MBI arm of RCT studies (using this as a proxy for intervention drop out) that was not dissimilar to drop out rates from other psychotherapies. However, rates of drop out were high with more than one in five participants dropping out from the MBI arm of trials. Clinical services could therefore focus efforts on supporting people to remain engaged in MBIs. The data available however, offered limited insight into moderators of engagement and this should be explored in future research.

Additionally, this meta-analysis identified several gaps in reporting dropout information in RCTs. First, we suggest a consistent report of therapy dropout along with sufficient information about reasons of dropping out. The methods used for optimizing retention could also be described. This would allow more meaningful comparisons of RCT dropouts with drop out in routine clinical practice.

3.4.3 Future directions

As reflected in current literature and is common practice in RCTs, the use of mailed or telephone reminder may be considered in the outpatient setting to reduce dropout (Deyo & Inui, 1980; Hans & Hiller, 2013). Future research may be conducted to compare the costs and effectiveness of these methods with the service and personal costs associated with dropout. Engagement in MBIs should be studied in more detail to reduce dropout from MBIs in clinical settings. Researchers should be encouraged to report therapy dropout (typically defined as attending at least four sessions in MBCT and MBSR, (Segal, Williams & Teasdale, 2002) in addition to study dropout to be able to identify the

replicability of the therapy in an outpatient setting. Patient level meta-analysis looking at moderators of dropout is also suggested in order gain more insight into the potential reasons for dropout. Moreover, suitable studies must be conducted to examine the psychological engagement or involvement in MBIs. Lastly, as recommended by previous researchers (Fjorback, Arendt, Ombol, Fink & Walach, 2011; Williams, Teasdale, Segal & Soulsby, 2000) more studies should compare MBIs with other group interventions to help draw firmer conclusions on the nature of engagement in MBIs specifically.

3.5 Conclusion

To our knowledge this is the first meta-analysis on dropout from MBIs in active control-arm RCTs for people experiencing mental health problems and it reveals that in spite of the extensive retention efforts, over one in five participants drop out from MBI arms within RCTs. An important reason for dropping appeared to be dissatisfaction with the intervention. Further research is needed to gain a greater understanding of the predictors of drop out from MBIs. If we can better understand the reasons why people experiencing mental health problems drop out from MBIs, we can refine the interventions to improve engagement.

Disclosure Statement

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Chapter 4: “Learning mindfulness is like learning to swim”: A qualitative study with NHS Staff Exploring the Facilitators and Barriers to Engaging in a Self-help Mindfulness-Based Cognitive Therapy

Abstract

In order to increase the cost-efficiency, availability and ease of accessing and delivering mindfulness-based interventions (MBIs), clinical and research interest in mindfulness-based self-help (MBSH) interventions has increased in recent years. Several studies have shown promising results of effectiveness of MBSH. However, like all self-help psychotherapies, drop-out rates and disengagement from MBSH is high. The current study aims to explore the facilitators and barriers of engaging in a MBSH interventions. Semi-structured interviews with members of NHS staff who took part in an MBSH intervention ($n = 16$) were conducted. A thematic analysis approach was used to derive central themes around engagement from the interviews. Analyses resulted in four overarching themes characterising facilitation and hindrance to engagement in MBSH. These are: “Attitude towards Engagement”, “Intervention Characteristics”, “Process of Change” and “Perceived Consequences”. Long practices, emerging negative thoughts and becoming self-critical were identified as the key hindrances, while need for stress reduction techniques, shorter practices and increased sense of agency over thoughts were identified as the key facilitators. Clinical and research implications are discussed.

Keywords: *Engagement, Self-help, Mindfulness, Thematic Analysis*

4.1 Introduction

Mindfulness is a process of purposefully cultivating non-judgemental attention to experiences in the present moment (Kabat-Zinn, 2003). Mindfulness-based interventions (MBIs) aim to improve psychological health by enhancing trait mindfulness (Quaglia, Braun, Freeman, McDaniel & Brown, 2016). Mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT) are the two most widely available and well-researched MBIs (Khoury et al., 2013). There is evidence from randomised controlled trials (RCTs) suggesting that MBIs can be effective at reducing risk of depressive relapse in recurrent depression in full or partial remission (Kuyken et al., 2016), lowers depressive severity in currently depressed individuals at post intervention in comparison to control conditions (Strauss, Cavanagh, Oliver & Pettman, 2014), reducing anxiety symptoms in patients with bipolar disorder in remission and in patients with some anxiety disorders (Chiesa & Serretti, 2011) and reducing stress and increasing psychological well-being in the clinical population (Hofmann et al. 2010). MBIs can also be effective interventions for the non-clinical population and reduces pre-post stress, anxiety, depression, distress, and improves quality of life (Khoury, Sharma, Rush, & Fournier, 2015). Additionally, MBIs are associated with improvements in burnout, stress, anxiety and depression symptoms among healthcare professionals (Lamothe, Rondeau, Malboeuf-Hurtubise, Duval & Sultan, 2016).

Despite this evidence for the effectiveness of MBIs, engaging in MBIs can prove challenging. A recent meta-analysis reported a median of 15.5% of drop out from MBIs ranging from 8% in one study to as high as 37% in another among people diagnosed with a current episode of an anxiety or depressive disorders (Strauss, Cavanagh, Oliver, & Pettman, 2014). Another meta-analysis of MBIs in non-clinical populations reported a dropout rate of 16.99%, ranging from 3% in one study to as high as 34.9% in another

(Khouri et al., 2015). MBIs are intensive interventions typically requiring daily formal mindfulness practice as well as cultivating mindfulness in daily life activities (Kabat-Zinn, 2003). Unsurprisingly, making time for daily mindfulness practice is commonly reported as a challenging (Wyatt, Harper & Weatherhead, 2014). Increasing awareness of thoughts whilst not engaging with their content is often described as one of the most ‘uncomfortable experiences’ (Wyatt et al., 2014, p. 223). The mind has a strong habitual tendency to wander to the content of thoughts and the “*detached observation*” (Kabat-Zinn 1982, p. 34) of a constantly changing field is difficult to attain (Chambers, Gullone & Allen, 2009). Direct engagement with negative thoughts during mindfulness practice can lead to an escalation of distress and a cycle of negative reinforcement (Bishop, 2002). In addition, qualitative analyses on the experience of participating in MBIs have reported participants can have difficulty in engaging in a mindfulness practice due to physical discomfort, self-doubt, a feeling of being trapped in the long practices and feeling exhausted or disoriented (Lomas, Cartwright, Edginton, & Ridge, 2014; Dobkin, Irving & Amar, 2012).

In addition to barriers of engaging in MBIs, challenges of disseminating the 8-week face-to-face interventions may limit the reach of MBIs. Challenges of disseminating MBIs include lack of trained mindfulness teachers, cost of community groups (Boggs et al., 2014; Crane & Kuyken, 2013), reticence to engage in group interventions and logistical challenges to fit courses in with work demands (Wyatt et al., 2014). Consequently, in order to increase the cost-efficiency, availability and ease of accessing and delivering MBIs, research interest in mindfulness-based self-help (MBSH) interventions is growing. Self-help approaches might be more efficient in terms of costs and use of resource and are also acceptable ‘minimal interventions’ for participants and therapists (Bower & Gilbody, 2005 p.11). Consequently, interest in MBSH has

proliferated in the recent years and a variety of MBSH resources are now available such as, self-help books, audio guides, online programmes and mindfulness smart phone apps (Cavanagh et al., 2014).

There is growing evidence of the effectiveness in MBSH interventions. A recent meta-analysis of 15 randomised controlled trials (RCTs) showed that self-help mindfulness/acceptance-based interventions resulted in significantly greater mindfulness/acceptance skills and fewer depressive and anxiety symptoms than control conditions at post-intervention (Cavanagh et al., 2014). Another quasi-experimental comparison study investigating the effect of web-based MBCT reported significant reductions in depressive severity and rumination and increased mindfulness in recurrently depressed participants in comparison to usual depression care (Dimidjian et al., 2014). In a non-clinical population, Cavanagh et al (2013) reported reduced perceived stress and anxiety/depression symptoms after a two-week MBSH program. Taylor et al. (2014) conducted an RCT using the MBSH book “Mindfulness: A practical guide to finding peace in a frantic world” (Williams & Penman 2011). The results revealed significant improvements in anxiety, depression and stress scores in a student sample in comparison to the wait-list control condition. Hence MBSH appears to be associated with benefits to mental health and wellbeing in both clinical and non-clinical populations.

However, a common challenge in self-help based psychological approaches is engagement, and rates of attrition from pure self-help interventions tend to be higher than supported interventions (Eysenbach 2005). A review reported the average dropout rates in self-help interventions is 31% (Melville et al., 2010). This is similar to average dropout rate from MBSH interventions (37%) reported in a recent meta-analysis (Cavanagh et al., 2014). However, these meta-analyses defined dropout as the percentage of participants completing post-intervention measures. It must be noted that engagement may or may not

be related to completion of post-treatment measures. It may be possible for participants to engage in an intervention but not complete post-treatment measures, or vice-versa. In nine studies that reported number of participants meeting the study defined engagement criteria more than half (52%) disengaged from the self-help interventions (Cavanagh et al., 2014). This may be higher than measurement completion rates because completing post-treatment measures demands less involvement compared to engaging in an intervention (Holdsworth et al., 2014).

Despite the high rates of disengagement from MBSH, we know surprisingly little about reasons for engagement and disengagement and theory is poorly developed in the area. Therefore, a qualitative approach to understanding reasons for engagement and disengagement in MBSH is warranted to contribute to theory development. Qualitative studies on the experience of participating in face-to-face MBIs (i.e. not self-help) have explored the issues of engaging with the intervention. A recent meta-synthesis of 15 qualitative studies examined the experience of participating in guided mindfulness interventions for individuals with mental health difficulties (Wyatt et al., 2014). The main ‘*struggles*’ identified include, practical limitations such as finding time, difficulty grasping the core concepts of mindfulness, being overwhelmed by new concepts, low mood and feeling distressed as a result of practising mindfulness meditation due to increased awareness on difficult memories and feelings. However, it is unclear if these themes would apply to MBSH. One of the key differences in MBSH and face-to-face MBIs is the group process. The meta-synthesis reported that a major theme of the experience of participating in face-to-face MBIs was the ‘*normalising and supportive process of the group*’ as one of the eight major analytic themes (Wyatt et al., 2014). Hence, across the 15 studies involving a total of 170 participants, the positive effect of the group was noted as one of the major contributors of the experience of engaging in

MBIs. Another meta-ethnography of the experience of participating in face-to-face MBIs by individuals with physical and mental health problems identified an important role for '*the group process*' (Malpass et al., 2012). This synthesis pointed out that the group context had a normalising effect, reducing the sense of stigma felt by participants and overcoming the experience of isolation. It might be argued that the group context played a pivotal positive role in MBIs by enhancing a sense of 'fellowship, camaraderie and connection' (Mackenzie et al., 2007, p. 64). The psychological processes therefore involved in engaging with MBSH, without a group context, may be different to that of face-to-face group-based MBIs and this needs to be directly examined. This is particularly important given the substantially higher rates of disengagement with MBSH in comparison to face-to-face MBIs.

A recent thematic analysis of the experience of a group-based face-to-face MBCT examined the factors that assisted and/or hindered engagement for patients with chronic pain (Moore & Martin, 2015). They identified '*belief in the programme*', '*perception of control*', '*struggles*' and '*acceptance of the presence of pain*' as the key factors contributing to engagement. Participants with positive perception of effects of from the MBCT programme were most motivated to continue mindfulness practice. A feeling of being empowered and to be able to take control of one's own behaviour and response facilitated engagement. The key struggles that the participants faced were inflated expectation that they would achieve pain control and time pressures. Lastly, accepting the pain without resistance facilitated engagement in the MBCT program. However, to the best of our knowledge, no studies have explored the facilitators and barriers of engagement to an MBSH intervention has not been previously explored.

With the growing research and clinical interest in the accessible forms of MBSH, examining the facilitators and barriers of engagement is crucial in order to maximise

engagement and thereby maximising opportunities to benefit. Our aim in this study was to identify facilitators and barriers to engagement in a non-guided MBSH intervention from participants' narrative of the experience using thematic analysis. The overarching research question of the current study is 'what are the factors that facilitate and hinder the process of engaging in a non-guided MBSH intervention'. To the best of our knowledge, no qualitative study so far has focused on the factors of engagement in MBSH interventions.

4.2 Methods

4.2.1 Participants

A total of 16 participants were interviewed in the study. The participants were a part of an uncontrolled feasibility study (n=31) investigating the effectiveness and acceptability of MBSH for NHS staff. Staff members had to be in a clinical role in the participating mental health NHS trust in order to be included in the study.

NHS staff members were selected for this study due to several reasons. First, time commitment is known to be one of the significant barriers of engagement in MBIs (Wyatt, Harper & Weatherhead, 2014). Research suggests that working within the NHS results in decreased ability to commit time for stress management techniques, (Shapiro, Shapiro & Schwartz, 2000). Hence, data obtained from an NHS staff sample would help to identify barriers of engagement in a conservative setting. Moreover, research suggests that NHS staff experience high levels of minor psychiatric disorder (Wall et al., 1997). Hence the findings from the current study could be generalised beyond the non-clinical population.

Participants were eligible to be interviewed once they had completed the MBSH intervention and completed the post-assessment quantitative measures. All participants

of the feasibility study were given the opportunity to be interviewed, however, only 16 participants (52%) agreed or were available to be interviewed. The participants age ranged from 24 to 60 with a mean of 43.81 years (s.d. = 10.29) and 15 (93.8%) were female. All the participants were White-British.

4.2.2 Interventions

Participants were free to select either an online or book-based MBSH course:

Mindfulness-based self-help (MBSH) book: The book “Mindfulness: A practical guide to finding peace in a frantic world” (Williams & Penman, 2011) was the MBSH used in this study. The book is based on the 8-week face-to-face MBCT course and teaches mindfulness practices and principles through text and a CD. Readers were advised to read one intervention chapter per week for the eight weeks of the course. A recent RCT showed that this using this book had large effect sizes on measures of stress, anxiety and depression in the student population in comparison to an inactive control condition (Taylor et al., 2014). Out of the participants interviewed, nine had opted for the book-based intervention.

MBSH online program: The ‘BeMindful’ (www.bemindful.com) website was used as the online version of the MBSH program. This course incorporates MBCT and MBSR elements and consists of 8 interactive 30-minute online sessions in addition to introductory and course-end videos. The class sequence is based on the MBCT course. A feasibility study reported that perceived stress, anxiety and depression reduced significantly at course completion and decreased further at 1-month follow-up, with effect sizes similar to face-to-face MBIs (Krusche, Cyhlarova & Williams, 2013). Of the participants interviewed, seven participants had opted for the online intervention.

4.2.3 Procedure

The study was advertised to staff from the mental health NHS trust via advertisements posted on the trust intranet, posters displayed around workplaces, fliers distributed at Trust events and emails. Written and oral information was provided to all participants. Participants had to complete the pre and post intervention questionnaire as a part of the feasibility study. Informed consent, including consent to record interviews, was obtained from all participants before the study commenced.

On receiving informed consent, participants were asked to contact the research team indicating their preference of the form of mindfulness-based self-help (MBSH) program - an MBSH book or access to an MBSH online program. After completing the 8-week intervention, participants who agreed to take part in the qualitative study were contacted to schedule the telephone interview. Telephone interviews were conducted within 2 weeks of completion of the intervention. Ethical approval was obtained from the NHS Trust research and development department and the University Research Ethics Committee (C-REC).

4.2.4 Measures

Sixteen one-to-one telephone interviews were conducted within two weeks of completion of the MBSH intervention. Interviews were based on the Change Interview (Elliot, Slatick & Urman, 2001), and reflective listening techniques (Stiles, 1993) were used in order to respond sensitively to experiences that emerged during the interviews. The Change Interview is a relatively unstructured interview designed to explore participants' experience of interventions. The questions are open-ended and are encourages participants to elaborate their experience of intervention in their own words. Some sample questions in the Change Interview protocol included, "what kinds of things about the

course have been hindering, unhelpful, negative or disappointing for you?”, “what things in your current life situation have helped you make use of the course?”, “what personal weaknesses do you think have made it harder for you to use course?”.

The interviewer had no involvement in organising and conducting the intervention. There was no contact between the interviewer and the participants prior to the interviews being conducted. The interviewer was acquainted to the MBSH book but not to the online intervention. Limitations of this prior knowledge are discussed below. The interviews lasted between 27 and 54 min (mean 34 min). All interviews were audio-recorded and transcribed verbatim by the first author. All written transcriptions were checked against the audio recording to ascertain accuracy by the first author. Identities of all participants were removed from transcripts to ensure anonymity.

4.2.5 Data Analyses

Transcripts were analysed using thematic analysis, which is a process of systematically working with the data, giving equal attention to each data item and identifying interesting aspects that form repeated patterns across the data set (Braun & Clarke, 2006). Inductive coding (Boyatzis, 1998) was used to code the data by the first author, followed by consultation with the third author. Inductive coding (Boyatzis, 1998) is where the researcher approaches the data with a bottom-up approach, without a preconceived theoretically derived coding framework. The interviews were re-read, literature referenced and the third author was consulted before the codes were interpreted. The coding process consisted of six phases recommended in the good practice guideline and the researcher moved between these phases (Braun & Clark, 2006). The phases were familiarisation with transcripts, forming initial codes, searching for themes, reviewing themes, defining and naming themes and producing reports. Brief memos elaborating relationship of the codes were prepared to organize the codes in a theme. Once the initial coding was

completed, the codes were examined for common patterns and dissimilarities across the codes. Transcripts were separately analysed and emerging themes were marked. This was followed by merging or differentiation of themes that emerged into over-arching themes. Although the themes may have been influenced by the primary research questions, no pre-existing theories or coding frames were used.

Three credibility and reliability checks were conducted. First, the first and third authors conducted a consensus review and appraisal of themes from each transcript. Second, two independent assessors with limited knowledge of the research question were allocated 40 sample quotations from the transcripts to allocate to a list of themes. The number of sample quotations used to conduct reliability checks were determined by previous qualitative analyses studies in the mindfulness literature. For example, Moore and Martin (2015) used 40 sample quotations, van Aalderen et al (2014) used 30 sample quotations and Chadwick et al (2011) used 40 sample quotations. Since the independent allocation of themes resulted in a high Kappa value (0.88), no further changes were made to the themes. Third, the over-arching themes were reviewed by the second author along with some sample quotations from the interviews. During each of these three stages, where there was disagreement, consensus was reached through discussion among the raters. No significant omissions were suggested.

4.3 Results

Four over-arching themes of facilitation and hindrance to engagement were identified, namely, “Attitude towards Engagement”, “Intervention Characteristics”, “Process of Change” and “Perceived Consequences”. The themes and sub-themes are described, followed by a narrative account of the themes in Table 4.1. Themes emerged through engagement in the book-based and web-based mindfulness self-help interventions were

analogous and no significant dissimilarities were noted between the intervention types and so these are presented together.

Table 4.1 Over-arching themes, themes and sample quotes

Over-arching Themes	Themes	Sub-themes	Sample Quotes
Attitude towards engagement	<i>Motivation to reduce stress:</i>		“I am always keen to learn how to manage stress better”. [Facilitator]
	<i>Prior knowledge:</i>		“I had heard about mindfulness from colleagues, so always wanted to try it out”. [Facilitator]
	<i>Positive predisposition:</i>		“I feel I was already mindful before the course started, so the practice didn’t feel strange, you know”. [Facilitator]
Intervention characteristics	<i>Rationale:</i>	<i>Belief in the rationale of mindfulness:</i>	“The justification given about how this [mindfulness] works, kept me motivated to keep carrying on [practice]”. [Facilitator]
		<i>Lack of rationale:</i>	“Maybe a better explanation of why this [thinking about my problems]

			<p>was not helpful would help,</p> <p>because unless I think about my problem how can I solve it!"</p> <p>[Barrier]</p>
	<p><i>Types of Practice:</i></p>	<p><i>Length of practices:</i></p>	<p>"Some of those [practices] were so long, I used to fall asleep".</p> <p>[Barrier]</p> <p>"I have noticed I am able to do the brief practice like 3-minute breathing even when I am in a lot of stress". [Facilitator]</p>
		<p><i>Intensity of the intervention:</i></p>	<p>"The course was too intense for me ... there was too much to do so I gave up". [Barrier]</p>
<p>Change Process</p>	<p><i>Becoming more mindful:</i></p>	<p><i>Decentering:</i></p>	<p>"I understood my mind is only a part of me ... so I can take a step back and read my own mind".</p> <p>[Facilitator]</p>

		<i>Present moment focus:</i>	“It [sitting mindfulness meditation] helped me find and anchor to the present moment ... I realised the current situation is not as stressful as I felt”. [Facilitator]
		<i>Habitual perseveration:</i>	“It was hard to stop myself from thinking about my to-do list, so I wanted to give up”. [Barrier]
Perceived Consequences	<i>Perceived effects of mindfulness on mental health and wellbeing:</i>	<i>Improved wellbeing:</i>	I have noticed I am calmer now when there is stress”. [Facilitator]
		<i>Emerging negative thoughts:</i>	“The thoughts you want to shut down comes to you easily during meditation. I once had to stop meditating because I didn’t want to think about it, it made me sad”. [Barrier]

	<i>Change in self-compassion:</i>	<i>Increased self-compassion:</i>	“I think it is good to practice [mindfulness] because it helps you accept your flaws and it’s O.K [to have flaws]”. [Facilitator]
		<i>Becoming self-critical:</i>	“I felt I wasn’t motivated [to practice meditation] because I was being harsh and critical of myself all the time. I felt, this is not difficult why can’t I get it”. [Barrier]
	<i>Increased sense of agency over thoughts:</i>		My mind always kept thinking ... but now I can notice [my thoughts] and respond. I feel I have more control over my mind now”. [Facilitator]

4.3.1 Attitude towards engagement

This overarching theme describes participants’ intentions of engagement before the intervention started. It also considers their perception of whether mindfulness is easy or difficult to engage with based on their personal dispositions. Three themes were identified under this overarching theme.

Motivation to reduce stress

Participants described their prior interest and positive attitude towards engaging in the intervention in order to manage stress better. This theme facilitated engagement as it seemed participants were already considering engaging with the intervention before it had started. For example,

“My job is so stressful; I felt I needed to learn it (mindfulness) so I could reduce my stress” (Sarah).

“So I thought (by learning mindfulness) I’ll get to learn strategies to manage stress at work and also in life” (Victoria).

Prior knowledge

Participants’ comments reflected that positive feedback and promising research findings had an impact in facilitating engagement in the intervention. Awareness of the effectiveness of mindfulness appeared in almost all of the interviews and was often described as the main precursor of willingness to participate in the intervention. For example,

“I talk about mindfulness all the time at work. Often we recommend mindfulness to patients because you know, it is really effective. And also so many of my patients said that it has changed their lives. So, when I got this opportunity, I said to myself I have to try it” (Anna).

“I wanted to participate because I knew that research says it (mindfulness) is effective for people with depression. I think it should be effective for us too so I wanted to help your research” (Emilia).

These responses from participants indicate awareness, positive attitude and curiosity to understand and learn mindfulness skills and hence facilitated motivation to engage prior to and during the intervention.

Personal Predisposition

Some participants noted that mindfulness was similar to their natural coping style and hence engaging in the intervention was not perceived as an extra undertaking. This perception of predisposition was mainly with respect to mindful daily activities, for example, “It felt really natural, I love nature so noticing nature was not unusual for me” (Emilia). The observation of a personal predisposition occasionally was noted with regard to more formal mindfulness practices, for example, “I didn’t know about the 3-minute breathing space before (the intervention started), but I think I have always done it, especially before important meetings. I always tend to pause and relax for a bit” (Katie).

4.3.2 Intervention characteristics

As an overarching theme, this encompasses the facilitators and barriers related to the materials provided and the practices suggested in the intervention.

Rationale

This theme was noted as a two-fold theme, working as a facilitator for some participants and a hindrance for others. Some participants noted that a reasonable rationale was provided in the intervention. Often it was noted as a motivation to practice, for example, “I didn’t know about this technique of thinking. It (intervention) was explained nicely so you know how this (mindfulness) works and why worrying might not always be good. That kept me going” (Amber). Some participants noted a good rationale as a facilitator that restricted disengagement, such as, “it is very important for me to understand what I

am doing and why, I guess if I didn't understand the logic clearly I would have given up" (Martha).

Contrastingly, some participants that the rationale was not robust, thereby serving as a hindrance to engagement. Some participants noted that the purpose of mindfulness was merely to distract oneself from worries and stress, for instance, "if there would be more clarity of how mindfulness works I might have given it another go. I understand worrying might not help but how this (mindfulness) would help I am not sure" (Charlotte).

Types of Practice

One of the most frequently noted theme in the interviews was the facilitators and barriers associated with the type of practice in the intervention. No contradictions were noted in this theme and the fundamental concern was apparent.

Length of practices

Participants reported that the longer practices such as, body scan and sitting meditation was more challenging to engage with compared to shorter practices. For example,

"To be honest, I enjoyed the overall experience and I think I have learnt mindfulness, but I can't do another body scan, it is way too long for me" (Adam)

"I see why you need to do it (sitting meditation) but I used to find it very uncomfortable. I don't think we are designed to sit for that long" (Rose)

Shorter practices, on the other hand, were noted as a facilitator of engagement. For example, "I am still practising the breathing exercise. I think I'll make a habit of it" (Grace), "I struggle to make time for things at work, but the short practices I can do during lunch" (Sophie). Shorter practices and mindful activities were also considered as a facilitator due to the ease of practice, such as, "I used to walk to work and now I mindful

walk to work. I think it (mindful walking) is short and easy to fit into your schedule” (Katie).

Intensity of the intervention

Some participants found the course more intense than they had expected and hence disengaged from the intervention, for example, “When I signed up for this (intervention), I had no idea there would be so many things to do every day. I wouldn’t have signed up had I known. I don’t have the time” (Chloe). Others felt a reduction in the intensity of the course might have led to increased engagement, for instance, “I liked what I was doing to be honest. Had there been less number of things (practices), I might have continued practice” (Ivy).

4.3.3 Change Process

This overarching theme describes changes brought about during mindfulness practice in the intervention. This overarching theme is two-fold, facilitating as well as hindering the process of engagement in the intervention. One participant summarised the process of participation in the intervention. For example, “It (mindfulness) might help you or it might not, but I do think through these practices you get to know yourself and your surroundings better” (Jessica).

Becoming more mindful

Most participants noted that some changes brought about by participating in the intervention changed their ‘way of being’ and this in turn motivated them to engage more. Several participants noted how they learnt to decenter, for example, “I realised we think all the time and then our thoughts become reality. You don’t realise how this affects you. I can now understand when I am over-thinking and I step back for a bit. I didn’t know you could do this. The more I meditate the better I get at stepping back” (Anna), “I

realised I am always on auto-pilot. It has become a habit, you know. As the weeks went by I realised I am changing, so I kept going (practising) (Amber).

Some participants noted the benefits of present moment focus facilitated their engagement in the intervention. For example, “The anchor thing was the most important learning for me. When I stop practising I tend to lose it, so I try to keep practising when possible” (Adam), “I think this is a new way of living really. When I am at present, I can see things more clearly. It is difficult to get it at first but I got better with practice” (Grace).

Habitual perseverance

Although the process of changing the ‘way of being’ facilitated engagement for some participants, others felt it was difficult to achieve and they had difficulty shifting from their pre-existing cognitive styles. For example, “I know it (mindfulness) is supposed to be good for you, but I am a do-er. I like to think about my problems and sort them out. I found it difficult to sit through the practices, so I gave up” (Rose). Some participants actively used the practice time for perseverative thinking for instance, “I have a busy life, I can’t stop and concentrate on my breathing, (and) I don’t have the time. To be honest, I sometimes used the meditation time to mentally make my to-do list. I realised I am not being able to do it right so I dropped it” (Sophie).

4.3.4 Perceived Consequences

This overarching theme describes the participants’ perception of the impact and consequences of taking part in the intervention. These include consequences of each practices and the complete intervention. As a two-fold overarching theme, there was facilitation as well as hindrance to engagement.

Perceived effects of mindfulness on mental health and wellbeing

Most participants described the effects the intervention has had on them and how this had influenced that level of engagement in the intervention.

Most participants noted that practising mindfulness made them calm, for example, “My job is very stressful and I usually quite anxious at work. My colleague pointed out the other day that I have slowed down, I am calmer now. I definitely think it is because of this course so I am not going to give it up” (Martha). Other participants pointed out how the intervention had helped them manage their emotions better, for instance, “I used to get very angry very quickly. I have noticed I don’t get angry so easily, it is probably because I am handling stress better these days, so I am planning to continue practice” (Emilia).

For some participants, however, practising mindfulness had a contrasting effect emotional well-being, for example, “I had recently had a bereavement in the family, the meditation brought all the memories back and I just couldn’t handle it. I had stopped practising from then on” (Chloe). For some participants more general negative thoughts emerged as a result of mindfulness practice, such as, “When you meditate, thoughts that you have been avoiding creep up on you, like your work stress, debts. I thought meditation would help me but it made me more nervous, so I didn’t practice as much I was supposed to” (Charlotte).

Change in self-compassion

As a theme, change in self-compassion acted as a facilitator for some and hindrance for others. Some participants noted their self-compassion increased during the intervention, helping them to continue practice, for example, “I used to get really harsh on myself, especially with work-related stuff. I never realised this before participating (in the

intervention). I am more kind to myself now, so it has helped me, I should probably practice more” (Jessica).

Some participants, however, noted that mindfulness practice made them more critical, for example, “I know it is supposed to work but I don’t think it did for me. I used to get really worked up about not getting the point, I don’t know if it is just me but I was demanding more and more from myself. So finally I gave up” (Jessica). For some participants, however, not practising as opposed to not “getting mindful” led to self-criticism, for instance, “I take my to-do list very seriously but I couldn’t make time. I realised I was getting bitter because I was not practicing so I finally removed it from my list of things” (Ivy).

Increased sense of agency over thoughts

A very common theme that emerged from the interviews was the participants’ increased sense of agency over thoughts and how this improved engagement, for instance, “I feel more in control of myself and less regulated by my mind. It is a good feel; I feel more liberated ... I think I will continue mindfulness” (Katie). One participant summarised this theme as,

“It was like learning to swim. You don’t always swim but once you know how to you will never drown. I now know about mindfulness and the being mode, I can use it when I am stressed. As long as I keep practising I will never get over-stressed, which is how I see this. I have more control now” (Sarah).

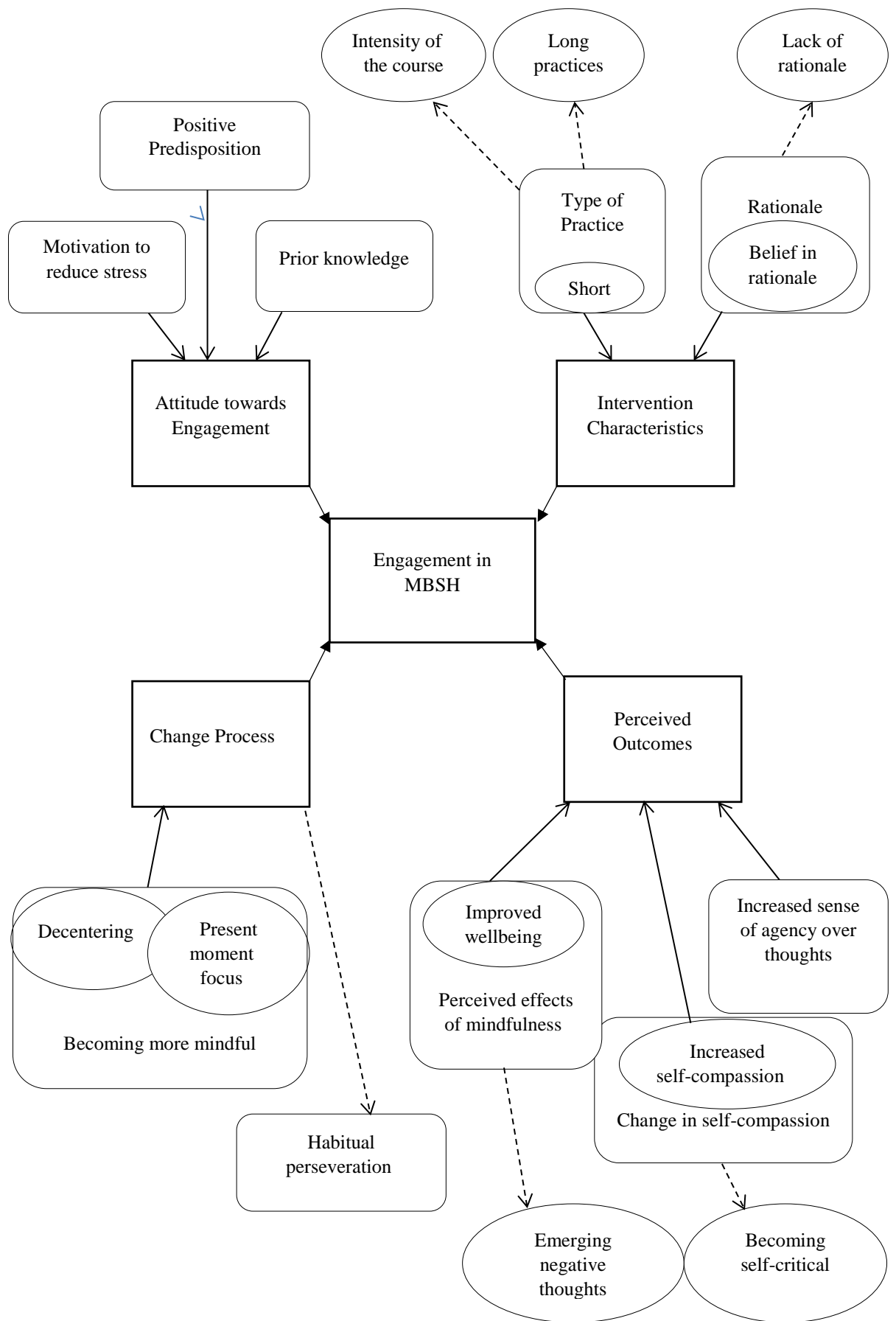


Fig 4.1. A model of the facilitators and barriers of engagement in MBSH interventions.

Note: Hindrances are marked by dotted arrows going outwards, while facilitators are arrows going inward.

4.4 Discussion

Although there is strong evidence of the effectiveness of mindfulness-based interventions (MBIs) in improving mental health and wellbeing in clinical and non-clinical populations (Kuyken et al., 2016; Khoury et al., 2015), MBIs may be challenging to engage with. These challenges appear to be even greater in mindfulness-based self-help (MBSH) interventions (as evidenced by high disengagement rates), perhaps because these do not provide the potentially supportive role of the group or mindfulness teacher. Therefore, in order to successfully increase access to MBSH, it is crucial to identify the factors associated with engagement.

This study aims to identify the facilitators and barriers to engaging in a MBSH intervention with healthcare staff. The overarching themes that appeared to influence participants' engagement were '*attitude towards engagement*' in the intervention such as, motivation to reduce stress, prior knowledge and positive predisposition; '*intervention characteristics*' such as, length and intensity of practices; '*change processes*' such as, becoming more mindful and habitual perseveration; and participants' '*perception of consequences*', such as improved wellbeing, change in self-compassion and increased sense of agency over thoughts.

Attitude towards engagement

The '*attitude towards engagement*' in MBIs consisted of themes of motivation to reduce stress or the perceived need of learning mindfulness and a perception of being positively predisposed or being naturally mindful. '*Prior knowledge*' of the effectiveness of mindfulness techniques also emerged as a facilitator of engagement in MBIs. This is similar to previous finding of expectancy research that suggests a link between a high

expectancy of change with greater compliance with homework tasks within CBT (Westra et al. 2007). It was interesting to note that the themes around attitude towards engaging in the MBSH were all facilitators, suggesting that participants that were interviewed started the intervention with an intention of engaging with it. In his well-established theory of planned behaviour, Ajzen (1985, 2012) stated that behavioural intentions can be used directly to predict behavioural achievement. Hence a positive intention or attitude towards engagement may enhance the level of engagement. However, this might also be reflective of sampling bias as all of the participants in this study volunteered for to participate and to be interviewed following use of their chosen MBSH intervention.

Intervention characteristics

The overarching theme of '*intervention characteristics*' clearly indicated the difficulty of engaging with longer practices and, in contrast, the relative ease of incorporating shorter practices in daily life. The number of practices or intensity of the intervention also hindered engagement. This is similar to previous research that indicated that conflicting demands and time are one of the key hindrances to engaging in MBIs more broadly (Moore & Martin 2005). This hindrance may also be typical of the current sample group as the workload in NHS is often reported as heavier than other professions (Weinberg & Creed, 2000) and hence the long practices may be particularly difficult to fit into the schedules. MBIs for healthcare staff could be tailored to incorporate shorter practices aimed at bringing mindful awareness to daily life activities. However, further research is needed to explore the effectiveness of shorter mindfulness practices as formal mindfulness meditation exercises (such as, body scan and sitting meditation) are more often reported to be associated with improvement in most facets of mindfulness (Hawley et al., 2014, Crane et al., 2016; Carmody & Baer, 2008).

'Decentering and focussing on the present moment' were indicated as facilitators of engagement in MBIs. This indicates participants who perceived themselves as *'becoming more mindful'* remained more engaged with the intervention. This is comparable to previous findings that suggest that a main struggle in engaging in guided mindfulness interventions for some participants is the difficulty "grasping the core concepts of mindfulness" (Wyatt et al., 2014, p. 223) and uncertainty about if they have "got the idea" (Moss et al., 2008 p. 137) of mindfulness. During the practices, getting caught up with habitual thinking was identified as one of the hindrances of engagement. This is predictable as perseverative thinking styles, such as rumination and worry, are antagonistic to the decentering processes involved in mindfulness (Wells, 2005). Moreover, previous studies suggest that participants of MBIs struggle to engage primarily due to resistance to altering habitual thinking styles. A grounded theory study on mindfulness practice reported that one of the main reason participants disengaged was the urge to "do" rather than to "be" (Langdon et al., 2011). This might be especially true for the current sample as their demanding work life might reinforce the habit of *doing* over *being*. Moreover, some participants in this study noted that they "used the meditation time to mentally make ... to-do lists". This is an important issue as this might suggest that participating in the intervention can in fact activate perseverative thinking, such as rumination and worry, that is known to implicate in the maintenance of, respectively, depression and generalized anxiety disorder (Kertz et al., 2015). It is particularly important for MBSH as the participants have limited or no support from a trained mindfulness teacher, who might encourage reconnection with the intention of mental activities during meditation practice (e.g. coming back to the breath).

Perceived Consequences

‘Perceived consequences’ are paramount to continuing engagement with any intervention. Predictably, positive perceived consequences of MBSH enabled engagement while negative perceived consequences obstructed engagement. The key facilitator for participants’ engagement was the perception of improved psychological well-being. This relates strongly to previous research suggesting improvements in psychological well-being and association between regular practice (Finucane & Mercer, 2006). One of the significant benefits of MBIs is an increase in self-compassion (Birnie et al., 2010). Themes from the current study demonstrate that perceived increase in self-compassion also facilitates engagement. Increase in self-compassion and improved relationship to self and others have been reported as an important theme of participating in guided mindfulness interventions in previous research (Wyatt et al. 2014). One of the commonly emerging themes of participating in guided mindfulness interventions is an increased sense of agency over thoughts (Wyatt et al. 2014). This positive consequence translated to increased engagement in the intervention. Although most participants described this theme as having “more control” over thoughts, further elaboration revealed it was the increased awareness of thoughts and thought patterns that enhanced acceptance and increased their perception of ‘control’. Some participants struggled to engage with mindfulness due to the perceived negative consequences such as, difficulty tolerating negative thoughts that emerged as a result of mindfulness practice and becoming self-critical due to guilt of disengaging from practice. Emerging negative thoughts during mindfulness practice has been previously noted as a key struggle to engagement. For example, Finucane & Mercer (2006 p. 7) reported that practicing mindfulness meditation led some participants to become more distressed, for example, one participant with history of childhood abuse, became aware of “horrible feelings through the body” that he/she “had never felt before”. This may be difficult to tolerate working alone, and

suggests that for at least some people, support from a trained mindfulness teacher may be essential in order to tolerate such memories and the feelings associated with their experience. MBSH interventions may aim to incorporate psychoeducation or virtual support in order to address this hindrance. Finally, self-criticism and guilt due to slipping out of the practice cycle was also reported in previous research (Langdon et al., 2011). However, paradoxically, mindfulness practice is reported to reduce self-criticism (Birnie et al., 2010). This might emphasize the need of having some form of trained support during participating in an MBI as self-criticism is known to self-predict poorer treatment outcome for mental health problems such as, depression (Marshall et al. 2008).

Support and guidance

The support of group and therapist have always emerged as a crucial theme in the experience of participating in MBIs (Wyatt et al., 2014). Interestingly, the lack of trained support or support from group members were not identified as a hindrance by any participants in this research. This is encouraging since self-help based MBIs have been found to be effective (Cavanagh et al. 2014) and are easier to deliver. However, this should be interpreted cautiously as the participants in the current study consented to participate in an MBSH and may have been more positively predisposed to this kind of self-guided learning process. Moreover, the participants might not have discussed the lack of support or group in the interviews as they volunteered for a self-help intervention or might not be aware of the additional support that is absent from these self-help interventions. The lack of support, however, may have translated to other hindrances such as, difficulty dealing with negative thoughts and feelings and not being able to break the cycle of habitual perseveration. Future research can compare the current findings with themes emerging from partially supported MBIs.

4.4.1 Strengths and Limitations

The primary limitation of this study was that only 16 of the 31 study participants were interviewed. Only twenty-four participants agreed to be interviewed of which sixteen were available for the interviews. This is similar to sample size of other qualitative studies in the mindfulness literature. For example, van Aalderen et al (2014) conducted a thematic analysis on 19 participants, May et al (2014) included 10 participants in their study and Chadwick et al., (2011) interviewed 12 participants. Although this sample size is not unusual for qualitative studies and collecting data from large sample is not crucial for qualitative analyses (Marks & Yardley, 2004), the data obtained from these participants may not be representative of all the participants who took part in the wider study e.g. the participants interviewed may have more positive views and experiences of engaging in the intervention than the participants who decided not to be interviewed. Moreover, participants who dropped out may have provided novel themes on the experience of participating in MBIs that led them to drop out from the intervention. Second, the NHS staff interviewed in the current study were all from the same region, working in a mental health trust and presumably had a positive attitude towards engagement (as they had self-selected to take part in the study) and hence the results might not be widely generalizable. The results should also be interpreted with caution given the investigators' bias inherent in such qualitative studies, however, several steps of validation were taken in order to reduce bias. Additionally, participants were made aware of the interviewer's independence to the main study, which may have contributed to reducing bias in the participants' responses in the interviews. Moreover, although qualitative research cannot be subjected to similar quality criteria as quantitative research, however, there are criteria for conducting good quality qualitative data collection and analysis (e.g. Yardley, 2000; Elliott, Fischer, & Rennie, 1999). The

British Psychological Society provides published criteria for assessing the quality of qualitative methods, such as thematic analysis (refer to <http://www.bps.org.uk/publications/journals/jop/qualitative-guidelines.cfm>). This study was limited for not using these criteria to ensure the thematic analysis conducted was of good quality. While this study has some areas for possible improvement, it is useful in highlighting the facilitators and barriers of engaging in pure self-help based mindfulness interventions.

4.4.2 Implications

This study has several implications. Given the need for effective occupational health interventions for healthcare staff, MBIs may have potential for reducing stress in healthcare professionals (Martín-Asuero & García-Banda, 2010). More research can explore the possibilities of tailoring MBIs for healthcare professionals which might include shorter practices and greater emphasis on mindful daily activities that incorporate mindfulness skills within their current schedules. Moreover, although the factors identified in the current study are comparable to factors of engagement in face-to-face MBIs, this study might raise some preliminary challenges for administering pure self-help based mindfulness interventions. These concerns can be explored in future research.

4.5 Conclusion

This study is the first published qualitative analysis that identifies facilitators and hindrance of engaging in mindfulness-based self-help (MBSH) as described by participants of the intervention. The four overarching factors associated with engagement in MBSH that were identified were “attitude towards engagement”, “intervention characteristics”, “process of change” and “perceived consequences. These themes echo

those found in face-to-face delivered MBIs, and may be used to develop and deliver more engaging self-help mindfulness-based interventions.

**Chapter 5: Barriers to Learning Mindfulness: A path
analysis exploring the role of rumination, worry and
engagement.**

Abstract

Little is known about the factors associated with engagement in mindfulness-based interventions (MBIs). Moreover, engagement in MBIs is usually defined in terms of class attendance (physical engagement) only. However, in the psychotherapy literature, there is increasing emphasis on measuring participants' involvement with interventions (psychological engagement). This study tests a model that rumination and worry act as barriers to physical and psychological engagement in MBIs and that this in turn impedes learning mindfulness. One hundred and twenty-four participants were given access to a two-week online mindfulness-based self-help (MBSH) intervention. Self-report measures of mindfulness, rumination, worry, positive beliefs about rumination, positive beliefs about worry and physical and psychological engagement were administered. A path-analysis was used to test the linear relationships between the variables. Physical and psychological engagement were identified as two distinct constructs. Findings were that rumination and worry both predicted psychological disengagement in MBSH which in turn predicted smaller improvements in trait mindfulness during the intervention. Physical engagement on the other hand did not emerge as a predictor of changes in mindfulness. Thus, rumination and worry may increase risk of psychological disengagement from MBSH which may in turn hinder learning mindfulness. Implications for practice and for MBIs more broadly are discussed.

Keywords: engagement; mindfulness; perseverative thinking; rumination; worry; self-help; online; drop-out

5.1 Introduction

Mindfulness is a process of purposefully cultivating non-judgemental attention to experiences in the present moment (Kabat-Zinn, 2003). Trait mindfulness is associated with increased subjective well-being and reduced psychological symptoms (Keng et al., 2011). Mindfulness based interventions (MBIs) increase trait mindfulness, in turn resulting in psychological health benefits (Gu et al., 2015). Amongst the several interventions that have utilised this principle, mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT) are two prominent psychological group-based interventions including primarily mindfulness practice and group discussion of principles (Baer, 2003).

The effectiveness of MBIs for a range of mental health conditions is well established. There is evidence from multiple meta-analyses suggesting that MBIs have positive effects in clinical populations by, for example, reducing the relative risk of relapse in people who are currently well with a history of three or more episodes of depression (Piet & Hougaard, 2011), reducing depressive symptom severity for people are currently depressed (Strauss et al., 2014) and reducing anxiety symptoms (Khouri et al., 2013). In addition, MBIs can reduce stress in non-clinical populations (Chiesa & Serretti, 2009).

Given the substantial evidence for effectiveness of group-based MBIs, research interest in mindfulness-based self-help (MBSH) interventions has proliferated as MBSH could provide a means of substantially widening access, particularly given some of the challenges with implementing MBCT in practice (Crane & Kuyken, 2012). Mindfulness-based self-help leads to lower levels of depression and anxiety symptoms, at least in non-clinical populations (Cavanagh et al., 2013; Cavanagh et al., 2014; Lever-Taylor et al.,

2014). Evidence is also emerging that these benefits may extend to clinical populations. Dimidjian et al (2014) trialled Mindful Mood Balance (MMB), a web-based MBCT program, with 100 people with a history of recurrent depression. There was a significant reduction in depressive symptom severity, rumination and a significant increase in self-reported mindfulness in participants of MMB compared to a non-randomised comparison group receiving usual care.

Whilst much research has focused on the effectiveness of MBIs in improving psychological symptoms, measuring engagement in the intervention is also crucial. If engagement is poor not only will this limit effectiveness, it could also increase a sense of hopelessness for participants (Oei et al., 1997), which in turn, may reduce psychological wellbeing (Fredrickson & Joiner, 2002). Participants usually have difficulty in engaging in a mindfulness and meditation practices due to physical discomfort, feeling exhausted or disoriented, self-doubt and a feeling of being trapped in the long practices, (Dobkin et al., 2012; Lomas et al., 2014). Moreover, mindfulness involves decentering from the content of the thoughts and feelings. This “*detached observation*” (Kabat-Zinn, 1982, p. 34) of a constantly changing field is difficult to attain (Chambers et al., 2009) as the mind has a strong habitual tendency to wander to the content of thoughts. Additionally, direct engagement with negative thoughts during mindfulness practice might lead to an escalation of distress and a cycle of negative reinforcement (Bishop, 2002). These potential negative consequences of mindfulness practice may result in disengagement from the practice (Lomas et al., 2014) and potentially to dropping out from the intervention.

Surprisingly, engagement in MBIs has not been clearly defined in the literature and there is lack of consensus on defining engagement in psychological therapies more broadly (Holdsworth et al., 2014; Tetley et al., 2011). A recent review of seventy-nine

studies of psychological therapies defined that engagement in psychotherapy as “all the efforts that clients make during the course of treatment (both within and between sessions) toward the achievement of changes (treatment outcomes)” (Holdsworth et al., 2014, p. 430). Engagement has been operationalized as a four-fold construct consisting of attendance, involvement, homework completion and therapeutic relationship (Holdsworth et al, 2014). The construct of ‘involvement’ is particularly pertinent to MBIs as participating in MBIs is often described as involving “integrating mindfulness into life” (Langdon et al., 2011, p. 276). The process of becoming more mindful appears to require “psychological participation” (Kabat-Zinn, 2003, p. 151) and involves not only performing discrete behaviour (e.g. formal mindfulness practice) but also developing a radically different ‘being’ mode that can be entered at any time (Langdon et al., 2011). Thus, engaging in MBIs is perhaps somewhat different from engaging in other psychotherapies as mindfulness is often described as an “approach to life” rather than a health behaviour (Langdon et al., 2011, p. 271).

We therefore propose a definition of engagement in MBIs. We suggest that engagement in MBIs involves *physical* engagement (session attendance and engagement in recommended between-session mindfulness practices) and *psychological* engagement. Psychological engagement we propose consists of five factors: (1) *motivation* to put time aside to participate in the MBI course; (2) *intention* to maintain a personal formal mindfulness practice during and after the MBI course; (3) *commitment* to bringing mindfulness into daily life; (4) the *belief* that practicing mindfulness will be beneficial to one’s mental health or wellbeing; and (5) the *therapeutic relationship* between the person and the MBI group and teacher. These five factors have established associations with treatment outcomes or treatment completion in the broader literature and so are good candidates to act as proxies for psychological engagement in MBIs: (1) motivation to

participate in treatment is related to psychosocial functioning during treatment and to treatment progress (Simpson & Joe, 2004); (2) intention is associated with treatment completion (Zemore & Ajzen, 2014); (3) commitment or readiness is related to engagement in therapy (George et al., 1998); (4) belief in treatment effectiveness is associated with treatment retention (Kressel et al., 2000); and (5) the therapeutic relationship predicts attendance and participation in treatment (Lecomte et al., 2012).

We know surprisingly little about engagement in MBIs and its correlates. A recent meta-analysis of randomised controlled trials (RCTs) in clinical populations reported dropout from MBIs ranging from 8%-38% (median=15.5%) (Strauss et al., 2014). Another meta-analysis of RCTs reported mean dropout rates from MBSH interventions may typically be higher (37%) (Cavanagh et al., 2014), but similar to dropout rates in other self-help therapies (31%) (Melville et al., 2010). Only one published study to our knowledge has investigated predictors of physical engagement in MBIs. An RCT of participants diagnosed with at least one episode of major depressive disorder (MDD) reported a 30% dropout from a face-to-face MBCT group (Crane & Williams, 2010). In this study, participants with high levels of depressive rumination and brooding (i.e. facets of rumination) were more likely to drop out from the intervention. Although these conclusions were tentative due to the small sample size, the findings are theoretically meaningful.

Paradoxically, Crane & Williams (2010) argue that those who drop out from MBIs might be the very ones who could benefit the most had they engaged with the intervention. Thus, identifying factors associated with engagement in MBIs is crucial in order to enhance both physical and psychological engagement for those who may be most likely to benefit. Two variables that are likely to predict poor engagement in MBIs are perseverative thinking styles and positive beliefs about these thinking styles (Fig. 5.1).

Perseverative thinking styles, such as rumination and worry, are antagonistic to the decentering processes involved in mindfulness (Wells, 2005). Rumination (Nolen-Hoeksema, 1991) and worry (Borkovec et al., 1998) are forms of perseverative thinking that are implicated in the maintenance of, respectively, depression and generalized anxiety disorder (Kertz et al., 2015). People who tend to ruminate and/or worry may find that they struggle to decenter during mindfulness practice and instead get lost in rumination or worry, heightening their distress and leading to them believing that mindfulness is unhelpful and then dropping out (as was found in the study by Crane & Williams, 2010). Furthermore, the metacognitive model of emotional vulnerability suggests that perseverative negative thinking, such as depressive rumination and anxious worry, is reinforced by metacognitive beliefs about the functions and consequences of such thinking (Wells & Matthews, 1996). If people believe that rumination and worry help them to solve the problem that they are ruminating/worrying about and/or will help them to prevent the worried-about event from coming true they may not believe that decentering from and letting go of difficult thoughts will be helpful leading to disengagement from the MBI.

MBSHs are likely to be particularly effective ways of studying engagement in MBIs *per se*, as MBSHs remove many of the non-specific factors in face-to-face MBIs that may themselves enhance engagement such as support from the group members and mindfulness teacher. The current study tests a model of engagement in online MBSH (Figure 5.1). Based on existing research and theory, we hypothesise that: (1) baseline levels of perseverative thinking (rumination and worry), and baseline positive beliefs about rumination and worry, will predict physical and psychological disengagement with MBSH; and (2) greater physical and psychological engagement in MBSH will in turn be associated with improvement in trait mindfulness. Additionally, we explore the

association between physical and psychological engagement in MBIs. To the best of our knowledge, this is the first published study to have specified two forms of engagement in third-wave therapies such as, MBIs – namely physical engagement (i.e. time spent in mindfulness practice) and psychological engagement (i.e. motivation, intent, commitment, belief and the therapeutic relationship).

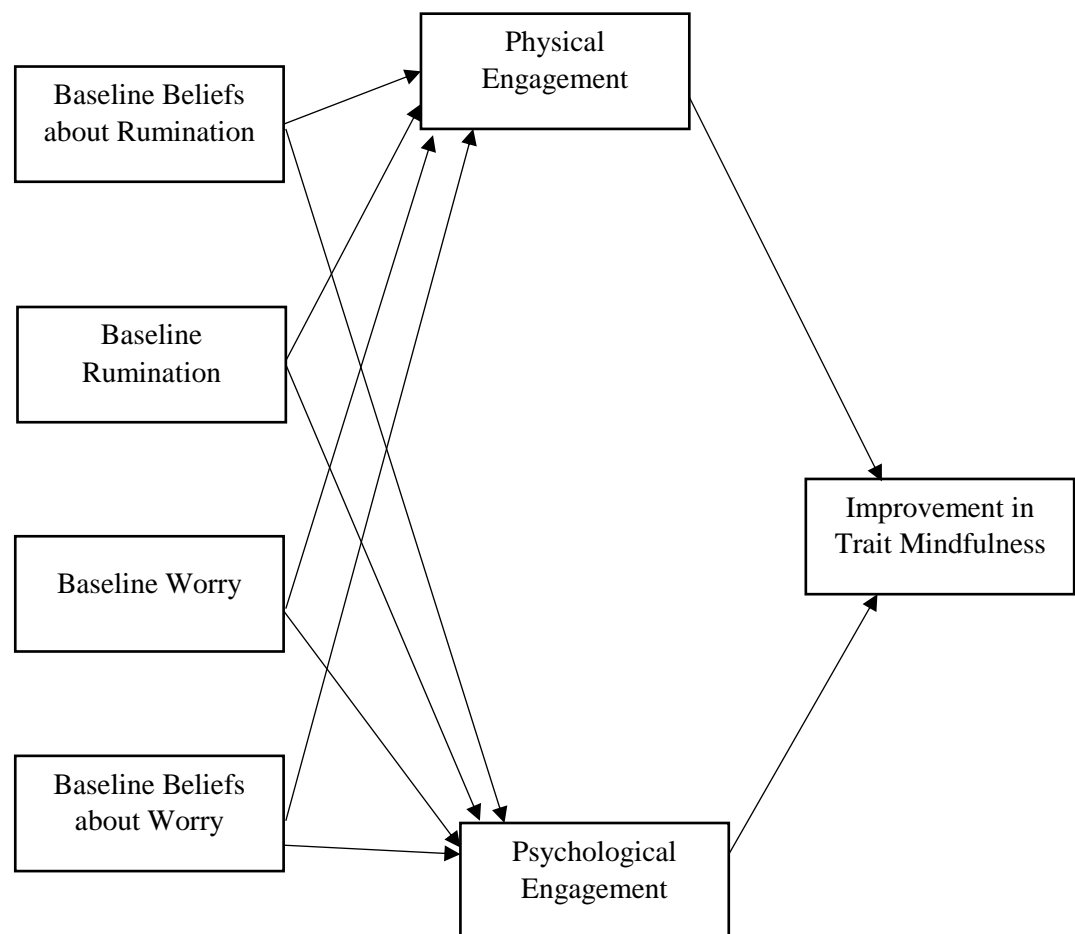


Fig. 5.1 The theoretical model of the relationship between baseline rumination, worry, positive beliefs about rumination and worry, physical and psychological engagement and change in mindfulness

5.2 Methods

5.2.1 Participants

Jackson (2003) suggested that the sample size to parameter ratio of 20:1 is ideal and 10:1 is acceptable for path-analysis. Since there were five parameters, a total of 124 participants were recruited to the study from a university in the South of England by responding to emails or posters advertising the study. Ethical approval was obtained from the host university ethics committee. All participants recruited for the study provided written consent to take part in the study. Age ranged from 18 to 61 years ($M = 23.4$ years, $SD = 6.6$ years), 76% were female, 83% were of white ethnicity, 84% were current students while the rest were current staff and 72% had no prior experience of mindfulness.

5.2.2 Intervention

The Learning Mindfulness Online (LMO) intervention (Cavanagh et al., 2013) comprised of six sections. The *Welcome* page was followed by the *Daily Mindfulness Practice* page, which included a choice of male and female voices for a 10-minute guided mindfulness meditation practice. The other pages included information on *Everyday Mindfulness Activities* (such as mindful tooth brushing and eating), *Daily Practice and Everyday Mindfulness Activities FAQ* (including information on range of emotions and feelings, both good and bad that may result from mindfulness practice), *My Daily Journal* (providing opportunity to record participants' thoughts and feelings as they progress through the intervention) and *Help and Assistance*. The section on *Study Information* provided crucial information regarding participation in the study along with contact details of the researchers and University counselling services (see Cavanagh et al, 2013 for details). Participants were given access to the program for 14 days.

5.2.3 Measures

Five facet mindfulness questionnaire – short form (FFMQ-SF; Bohlmeijer et al., 2011)

The FFMQ-SF is a 24-item self-report scale, with each item rated on a 1 to 5 scale, where 1 is never or very rarely true and 5 is very often or always true. It assesses five facets of mindfulness: observing, describing, acting with awareness, non-judging and non-reactivity and subscales have good internal consistency in this study ($\alpha = 0.89$). However, a recent hierarchical confirmatory factor analysis revealed that in a non-meditative sample, a 4 factor FFMQ (FFMQ – ‘observe’ subscale) is preferred over a five-factor score (Gu et al., 2016). Hence, the total score for FFMQ included four facets (describing, acting with awareness, non-judging and non-reactivity) of mindfulness only.

Ruminative Responses Subscale (RRS; Nolen-Hoeksema & Morrow, 1991)

The RRS is a subscale of the response styles questionnaire (RSQ; Nolen-Hoeksema & Morrow, 1991) with 22 items, each item rated on a 4-point scale, where 1 is almost never and 4 is almost always. The internal consistency in this study (Cronbach's α) is 0.95.

Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990)

The PSWQ consist of 16 items, each rated on a 5-point scale, where 1 is not at all typical of me and 5 is very typical of me. The PSWQ had moderate internal consistency in this study ($\alpha = 0.70$).

Positive beliefs about rumination scale (PBRs; Papageorgiou & Wells, 2001)

The PBRs consists of 9 items, each rated on a 4-point scale from 1 - do not agree to 4 - agree very much and assesses positive beliefs about rumination. The PBRs has high internal consistency ($\alpha = 0.88$ in this study).

Positive Beliefs about Worry (PBAW; Wells & Cartwright-Hatton, 2004)

The PBAW was measured using a subscale of the metacognitions questionnaire (MCQ) called *positive* beliefs and consisted of 6 items measured on a 4-point scale, where 1 is do not agree and 4 is agree very much. The subscale had high internal consistency ($\alpha = 0.88$).

Measures of Engagement

Physical Engagement – Physical engagement was defined as the frequency of mindfulness practice and this was measured using two self-report questions. The items were “*on how many days [over the past two weeks] did you practice mindfulness meditation at least once?*” and “*how many times on an average did you practice mindfulness meditation each day?*”. The total physical engagement score was calculated by multiplying these two figures together (i.e. physical engagement = number of days on which mindfulness was practiced x number of times per day mindfulness was practice).

Psychological Engagement – An existing validated measure of psychological engagement in MBIs could not be found and therefore a measure was developed for this study. Items were developed to measure each of the elements in our proposed definition of psychological engagement in MBIs (see above), but without an item for the ‘therapeutic relationship’ element given this is a pure self-help intervention. This resulted in a four item measure: (1) Motivation (*[over the past two weeks], how motivated were you to set time aside to use the mindfulness online course?*); (2) Intent (*how likely do you think you are to engage in mindfulness?*); (3) Commitment (*how often did you bring mindfulness principles into your life each day?*); and (4) Belief (*how effective do you think mindfulness is in helping to deal with stressful situations?*). Items were rated on a five-

point scale ranging from 1 (not at all) to 5 (completely). This scale had high internal consistency ($\alpha = 0.82$), a preliminary indicator of its psychometric properties.

5.2.4 Procedure

Participants were given the link to the baseline questionnaires (hosted by <http://www.surveymonkey.com>). On completion, access to the LMO site through the university's virtual learning environment was provided. After the 14-day intervention period, participants were sent the post-intervention questionnaire link.

5.2.5 Data Analysis

Data were analysed using SPSS (Windows version 22.0) and AMOS Graphics (version 22.0; Arbuckle, 2006) software. As a first step, correlations between all the variables were examined. Model fit was evaluated using several fit indices and convergence between findings was assessed (Byrne, 2010), namely, the Satorra-Bentler chi-square, the root mean square error approximation (RMSEA), the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI) and the comparative fit index (CFI). The Satorra-Bentler chi-square is a chi-square fit index that corrects the statistic under distributional violations by determining whether the value of this statistic is less than twice the model's degrees of freedom (Kline, 2005). Second, an RMSEA values less than 0.08 indicates an adequate fit. The closer the values of GFI and AGFI indexes are to 1 the better the fit. The CFI measures the proportional improvement in fit by comparing a hypothesized model with a more restricted baseline model. The CFI indexes also range from 0 (absolute lack of fit) to 1 (perfect fit).

5.3 Results

Of one hundred and twenty-four participants who agreed to take part in the study, eighty-one (65 %) participants completed the post intervention questionnaires. Among

the participants that completed the post-intervention measures, 5 participants did not complete the engagement questions and so were excluded from the analysis. This resulted in 76 participants being included in the analysis (61% of original sample). The mean age of these participants was 24.65 years (SD = 7.67, range = 18 – 61), 75% of completers were female.

Table 5.1 Descriptive statistics (range, means and standard deviation) and Pearson's correlation coefficients of the measures (N=76)

	Mean (SD)	Range	1	2	3	4	5	6
1 Baseline FFMQ-SF	56.91 (8.93)	39 – 89	-					
2 Baseline RRS	51.03 (16.38)	22 – 79	-.14	-				
3 Baseline PSWQ	46.82 (10.21)	25 – 64	-.15	.38**	-			
4 Baseline PBRs	24.39 (5.67)	13 – 36	-.22*	.07	-.21	-		
5 Baseline PBAW	10.50 (3.97)	6 – 24	-.23**	.12	.15	.38*	-	
6 Physical Engagement	5.61 (1.86)	1 – 12	.09	-.64**	-.33**	.01	.08	-
7 Psychological Engagement	3.21 (.77)	2 – 4.5	-.07	-.40**	-.43**	.17	.15	.29*

Note: ** $p < 0.01$, * $p < 0.05$

FFMQ-SF= Five facet mindfulness questionnaire – short form (Bohlmeijer et al., 2011); PBAW=Positive Beliefs about Worry (Wells & Cartwright-Hatton 2004); PBRs=Positive beliefs about rumination scale (Papageorgiou & Wells 2001); PSWQ=Penn State Worry Questionnaire (Meyer et al., 1990); RRS=Ruminative Responses Subscale (Nolen-Hoeksema & Morrow, 1991)

Descriptive statistics and correlation coefficients between path analysis variables are shown in Table 5.1. This shows that baseline rumination and worry were both associated with poorer physical engagement and psychological engagement at the zero-order level. Positive beliefs about rumination and positive beliefs about worry on the other hand were not significantly associated with measures of engagement. Finally, there was a significant correlation between physical and psychological engagement but with only a small-medium effect size suggesting that these variables may be partially independent.

5.3.1 Path Analysis Findings

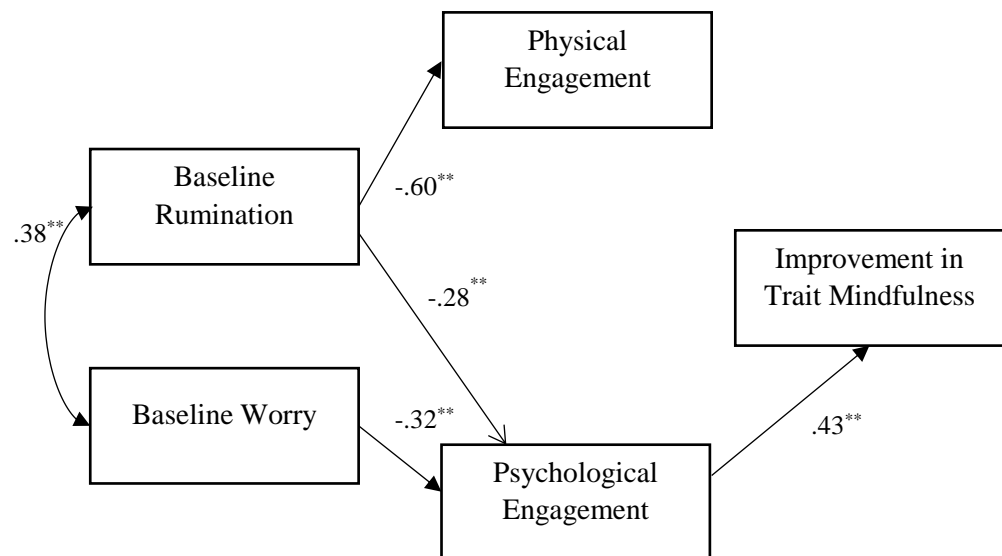


Fig. 5.2 The empirical model along with the significant standardised path coefficients are presented. Double-pointed arrows depict covariance. $N = 76$; ** $p < 0.001$

Seven observable variables were tested in the model shown in Figure 5.1. Whilst initial evaluation of the model in Figure 5.1 indicated a good fit with the data (see Table 5.2), the model showed non-significant paths between worry and physical engagement ($\beta = -.09$, $p = .31$) and between physical engagement and pre- to post-MBSH changes in mindfulness ($\beta = .17$, $p = .12$). Positive beliefs about rumination and worry were not associated with physical or psychological engagement.

The model was updated by eliminating the non-significant paths, and fit was evaluated again. The model fit statistics from testing the final model are shown in Table

5.2. Fit indices indicated an adequate fit to the data, with decreases of Satorra-Bentler chi-square and RMSEA values, a value of AGFI closer to 1 and an almost perfect fit of CFI value. The final model as well as standardized coefficients and R^2 values are shown in Figure 5.2, with R^2 values shown above each endogenous variable. Rumination yielded statistically significant path coefficients to physical engagement (explaining 64 % of the variance of this variable) with higher levels of rumination related to lower levels of physical engagement and to psychological engagement (explaining 28% of the variance). Worry on the other hand yielded a statistically significant path coefficient to psychological engagement (explaining 32 % of the variance). In addition, psychological engagement yielded statistically significant path coefficients for pre- to post-MBSH changes in mindfulness (explaining 43 % of the variance).

Table 5.2 Fit indices for the empirically derived path model (shown in Figure 5.2)

Model	χ^2 (df)	$\chi^2 \div (df)$	RMSEA (90 % CI)	GFI	AGFI	CFI
Initial Model (Figure 5.1)	7.07 (5)	1.41	0.09 (.00 - .19)	.97	.83	.95
Final Model (Figure 5.2)	4.08 (3)	1.36	0.07 (.00- .17)	.98	.90	.99

Note: Root Mean Square Error of Approximation(RMSEA) of .05 or less, goodness of fit index(GFI), adjusted GFI(AGFI) and Comparative Fit Index (CFI) >.9 indicates good fit.

5.3.2 Engagement in the MBSH intervention

See Table 5.1 for the means and standard deviations on the physical and psychological engagement measures. Further details are that 77% of participants reported practicing mindfulness once per day during the intervention period while 20% participants practised mindfulness more than once a day. In terms of the psychological engagement questionnaire, levels of engagement (indicating 3 or more on the subscale) were: 84.2% of participants said that they were motivated to set time aside to use the mindfulness online course, 68.4% participants said that they were likely to engage in mindfulness practice, 57.8% participant brought mindfulness principles into their daily life each day, and 79.0% of participants reported that mindfulness was effective in helping them deal with stressful situations.

5.4 Discussion

The primary aim of the study was to test a theoretically defined model of engagement in MBIs (Figure 5.1) and this was partly supported and refined resulting in the final empirically supported model (Figure 5.2). It is of note that the association between physical and psychological engagement was small medium in size supporting the assertion that these are partially independent constructs. The final model (Figure 5.2) shows that baseline worry and rumination were both associated with poor psychological engagement in the MBSH intervention which in turn was associated with reduced pre- to post-MBSH improvements in trait mindfulness. Baseline rumination, but not worry, was associated with poor physical engagement in MBSH, but poor physical engagement not associated with pre- to post-MBSH improvements in mindfulness. Finally, contrary to hypotheses, beliefs about worry and rumination did not play a part in the final model as these variables were not associated with either physical or psychological engagement.

As predicted, our study showed that trait rumination and worry prior to starting the MBSH intervention were related to psychological engagement in the intervention, with rumination also associated with physical engagement. This is consistent with the findings of a previous study (Crane & Williams, 2010) that found that participants who dropped out from MBIs had higher levels of depressive rumination and brooding at baseline than those not dropping out. Rumination and worry are habitual and relatively stable perseverative thinking styles (Watkins, 2008). It may be possible that rumination and worry actively inhibit practising mindfulness, as this requires shifting focus from the content of the thoughts. Moreover, perseverative thinking that may surface during mindful practice may be distressing, inhibiting the development of positive beliefs about mindfulness. This struggle of habitual perseverative thinking coupled with a lack of belief in mindfulness may result in disengagement from the intervention.

The finding that rumination and worry are associated with psychological disengagement from MBSH presents a challenge to the dissemination of mindfulness teaching via self-help in particular but may be also relevant to face-to-face MBIs (see Crane & Williams, 2010). Rumination and worry mediate depression and anxiety (Muris et al., 2005) and there is substantial evidence suggesting that MBIs are effective in the treatment of depression and anxiety (Hofmann et al., 2010) with effects mediated by reductions in rumination and worry (Gu et al., 2015). Hence, the people who might benefit the most from MBIs are the very ones who are most likely to disengage from the intervention. Addressing this issue of disengagement is crucial in ensuring that the reach of potential benefits of MBIs can be extended to the people who could benefit the most.

Interestingly, results revealed that primarily rumination accounts for physical disengagement whilst predominantly worry accounts for psychological disengagement. Watkins, Moulds & Mackintosh (2005) reported that one of the primary differences

between worry and rumination the content of worrisome thoughts are more unpleasant or disturbing compared to ruminative thoughts. The thoughts that emerge during mindfulness practice for participants who are used to worrying may be more difficult to tolerate, leading to lesser involvement in the intervention. Additionally, people who ruminate generally have lesser years of experience with the ruminative thoughts (Watkins, Moulds & Mackintosh, 2005). This may have led to the participants to remain involved with the intervention more than participants with more worrisome thoughts. Future studies can investigate the effects of each of these perseverative thinking styles on engagement in mindfulness in further details.

It is of interest that effects were evident for psychological engagement over and above that for physical engagement. Indeed, only psychological engagement was associated with pre-post improvements in mindfulness. This fits with the suggestion made earlier that psychological engagement in MBIs may be particularly important in determining benefits, and this may be over and above the importance of physical engagement. The suggestion that mindfulness requires “psychological participation” (Kabat-Zinn, 2003, p. 151) and is an “approach to life” rather than a health behaviour (Langdon et al., 2011, p. 271) is relevant here. Our findings are consistent with the suggestion that a tendency to ruminate or worry leads to psychological disengagement in MBSH (poor motivation, intent, commitment and belief) which in turn leads to reduced improvements in trait mindfulness, although these causal hypotheses require testing in future research. This suggestion also needs to be interpreted with caution as it is only reflective of a non-clinical population and a brief, two-week MBSH intervention. Future studies can investigate whether physical or psychological engagement have differential associations on the beneficial effects of standard MBIs (i.e. MBCT/MBSR) in clinical populations. Nevertheless, the findings clearly highlight the value of measuring

psychological engagement in MBIs rather than simply quantifying engagement as the number of classes attended or amount of mindfulness practice engaged in.

Another interesting finding is the low shared variance between physical and psychological engagement with these variables sharing only around 5% of their variance. This suggests that psychological engagement in mindfulness is not closely associated with amount of mindfulness practice. Psychological participation in the MBSH intervention was associated with increased mindfulness over the course of the intervention while physical engagement was not. This is contrary to evidence that suggests that amount of mindfulness practice may be associated with greater increases in mindfulness (Carmody & Baer, 2008). Teasdale (1999) identified two distinct types of meta-cognition in relation to MBIs, namely, meta-cognitive knowledge and meta-cognitive insight. Meta-cognitive knowledge may be defined as *knowing* that thoughts are not always accurate whilst meta-cognitive insight is *experiencing* thoughts as events (Teasdale, 1999). Our findings could suggest that *knowing* and *experiencing* may only be loosely related to each other and that it may be possible to develop one without the other. Moreover, our findings are consistent with the suggestion that meta-cognitive knowledge may be particularly important in determining improvements in mindfulness in MBSH. Future studies can investigate whether physical or psychological engagement have differential associations in enhancing mindfulness in standard MBIs (MBCT/MBSR) and in clinical populations.

Contrary to our hypothesis, positive beliefs about rumination and worry at baseline were not associated with either physical or psychological engagement in the MBSH intervention and effect sizes were negligible (i.e. these findings are unlikely due to low statistical power). Moreover, we found that these positive beliefs did not correlate with rumination or worry at baseline. Whilst this is contrary to some previous findings

(Papageorgiou & Wells, 2004; Watkins & Baracaia, 2001), recent evidence suggests that positive beliefs about rumination and worry may not be associated with depression and anxiety (Gawęda & Kokoszka, 2014), questioning their role in these conditions. The lack of association in the current study between these positive beliefs and rumination and worry highlights the need for further research into these constructs and the role that they may or may not play in causing and maintaining depression and anxiety.

5.4.1 Limitations

There were a number of limitations with this study. First, the sample predominantly consisted of young adults from a single university, this may restrict the generalizability of the findings of this study. Second, the measure of psychological engagement was developed for this study and its psychometric properties have yet to be fully tested. However, the internal consistency of the psychological engagement questionnaire was high ($\alpha = 0.82$) and its convergent validity is supported given the correlation between the measure and pre- to post-MBSH improvements in mindfulness, a construct that would be expected to be associated with psychological engagement. Also, in our measure of psychological engagement we did not include an item to tap the ‘therapeutic relationship’ element as ours was a pure self-help intervention. However, there is emerging evidence that people can develop a meaningful relationship with self-help interventions (Cavanagh & Millings, 2013) through the relationship built between the reader and the author (e.g. how we imagine the author to be, feeling understood by them). Third, the accuracy of physical engagement reported by participants was not assured. Physical engagement scores (i.e. time spent in mindfulness practice) may be influenced by social-desirability effects, as with any self-report measures. In future studies, technology could be used to objectively monitor level of engagement in the online intervention. Fourth, our results directly apply to online MBSH only. However, MBSH is a particularly good test of

engagement in MBIs as it removes many of the non-specifics of MBIs that may enhance engagement such as other group members and a supportive mindfulness teacher. Finally, mindfulness research is often hampered due to the problems of measuring mindfulness itself. Measurement of mindfulness is dependent on a self-report measure in this study, but at present there are no well-established reliable and valid alternatives (Bergomi et al., 2013).

5.4.2 Clinical Implications

This study has identified factors that are related to poor engagement in MBSH – namely rumination and worry. Similar associations have also been identified for face-to-face MBCT (Crane & Williams, 2010), and it may be useful for both self-help and face-to-face MBIs to incorporate more discussion and psychoeducation on how rumination and worry might present challenges to practice and how to respond to this. This could include support with ways of responding to distressing thoughts and feelings during mindfulness practice and the rationale for the intervention in terms of reducing worry and rumination, and that this may take some practice.

Another clinical implication of the study may be the differential associations of physical and psychological engagement to outcomes in MBIs. According to the MBSR and MBCT protocols, participants attending at least four classes are classed as having ‘completed’ the intervention. However, attending classes may not always correspond to psychological participation in the intervention (as demonstrated by the small-medium sized correlation in this study between psychological and physical engagement). Hence researchers and clinicians should take account of participants’ psychological as well as their physical engagement in MBIs.

Finally, an attempt to cultivate positive beliefs about mindfulness could be incorporated into the online MBSH intervention used in this study in order to increase psychological engagement in the intervention. Changes in the program content by including more psycho-education and interactive elements may result in increased positive beliefs about mindfulness (and thereby increasing psychological engagement) and potentially to increases in mindfulness and associated benefits to psychological health.

5.5 Conclusion

This study tested a path analysis model (Figure 5.2) and found that baseline rumination and worry were associated with poorer psychological engagement in MBSH which in turn was associated with smaller rates of pre-post improvements in mindfulness. This is despite the fact that people with high trait rumination or worry might be the very people who might benefit most. Furthermore, two facets of engagement (physical and psychological) in mindfulness-based interventions (MBIs) were identified and results suggested that these two facets of engagement are partially independent. Findings pave the way for future research exploring ways of optimizing engagement in MBSH specifically but also in MBIs more generally and in particular optimising engagement for those people who might benefit most.

Disclosure Statement

None of the authors report financial or personal relationships that could inappropriately influence (or bias) their decisions or work on this article.

**Chapter 6: Barriers to Mindfulness: The role of
rumination and worry in predicting disengagement
from an online mindfulness-based intervention**

Abstract

Research into engagement in mindfulness-based interventions (MBIs) is in its infancy. Although engagement in MBIs is usually defined as class attendance (physical engagement) only, a recent study defined engagement in MBIs using two facets – physical and psychological engagement (Banerjee, Cavanagh & Strauss, under review). The study reported that rumination and worry were barriers to engaging in a 2-week online MBI. However, this study had no control conditions to establish if such repetitive negative thinking styles were unique barriers to engaging in this MBI, or more general barriers to engagement with any brief intervention. The current study tests a model that rumination and worry act as barriers to physical and psychological engagement specifically for MBIs and measures how engagement affects changes in trait mindfulness. One hundred and thirty-six participants were randomised to either a brief mindfulness or an active control condition and were given access to these in the form of a two-week online self-help intervention. Self-report measures of mindfulness, rumination, worry, and physical and psychological engagement were administered. Findings were that rumination and worry both predicted psychological disengagement in the mindfulness-based self-help (MBSH), while only rumination predicted physical (dis)engagement. No such associations were established in the control condition. Greater physical and psychological engagement in MBSH predicted greater improvements in trait mindfulness during the intervention. Physical and psychological engagement were identified as two distinct constructs. Thus, rumination and worry may increase the risk of disengagement in MBSH which may impede learning mindfulness. Implications for practice and for MBIs more broadly are discussed.

Keywords: engagement; mindfulness; perseverative thinking; rumination; worry; self-help; online; path-analysis

6.1 Introduction

Mindfulness is “the awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding experience moment by moment” (Kabat-Zinn, 2003 p. 145). This kind of awareness runs counter to rumination and worry; repetitive negative thinking processes that play an important role in the cause and maintenance of mental health difficulties (Kertz et al. 2015).

Over the recent years, research interest in mindfulness-based interventions (MBIs) has increased. Mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT) are two well-established MBIs grounded in mindfulness training (Baer, 2003). MBSR and MBCT consist of eight group-based weekly sessions that guide participants through a range of mindfulness practices (Kabat-Zinn, 1994; Segal et al, 2002) that aim to develop mindfulness skills (Chiesa & Malinowski, 2011; Kabat-Zinn, 1994; Segal et al, 2002). Evidence from meta-analyses of randomised controlled trials shows that MBIs are more effective in reducing depressive relapse in comparison to active control conditions (hazard ratio, 0.79; 95% CI, 0.64-0.97) (Kuyken et al., 2016), reducing symptom severity of currently depressed people (Strauss et al., 2014), reducing anxiety symptoms (Hoffman et al., 2010) and reducing stress in the non-clinical population (Chiesa & Serretti, 2009). Moreover, a recent meta-analysis found that the effect of MBIs on clinical outcomes are mediated by changes in rumination and worry (Gu et al., 2015).

Despite strong evidence for effectiveness in clinical and non-clinical populations and for mechanisms of change, engaging in MBIs may be particularly challenging as mindfulness is often referred to as an “approach to life” (Langdon et al., 2011, p. 271) rather than a discrete health behaviour. Hence, engaging in MBIs not only involves

intentionally undertaking distinct behaviours (e.g. formal mindfulness practice) but also involves developing a radically different ‘being’ mode that can be entered at any time (Langdon et al., 2011). A recent meta-synthesis of qualitative studies exploring the experience of engaging with MBIs reported on common struggles. In addition to time commitment and physical limitations, key struggles were understanding the concepts of mindfulness, being overwhelmed by new concepts and feeling more distressed due to emerging repetitive negative thinking (i.e. rumination and worry) (Wyatt et al. 2014). This accords with quantitative studies which have found that brooding (a form of rumination) predicts drop-out from MBCT (Crane & Williams, 2010), and that both rumination and worry were predictors of disengagement of a brief online MBI (Banerjee, Cavanagh & Strauss, under review). This presents a paradox as MBIs appear to work, at least in part, through reducing repetitive negative thinking (Gu et al., 2015). Thus, participants who disengage from MBIs due to repetitive negative thinking may be the very ones most likely to benefit from the interventions. It is therefore crucial to investigate factors associated with engagement in MBIs in order to reduce disengagement for those at risk.

Research on engagement in MBIs is in its early stages. There are several ambiguities that challenge research in this field. First, the definition of engagement in MBIs is variable. Studies have defined engagement in MBIs mainly through session attendance and time spent engaging in mindful meditation practices (Spijkerman et al., 2016; Cavanagh et al., 2014, Piet & Hougaard, 2011). However, there are contradictory findings as to the relationship between formal mindfulness practice and beneficial outcomes (Dobkin & Zhao, 2011, Carmody & Baer, 2008). Moreover, informal mindfulness practice (awareness of breath; being mindful while engaging in various daily tasks) may also contribute to improvements in mindfulness and self-compassion

(Hindman et al., 2015). Second, “integrating mindfulness into life” (Langdon et al., 2011, p. 276) is also regarded as a key to engaging in mindfulness as mindfulness practices are often regarded as the ‘merely launching platforms’ (Kabat-Zinn, 2003 p. 147) for becoming more mindful. Consequently, in order to effectively explore the factors associated with engagement in MBIs, it is vital to provide a definition that integrates all of these processes.

We have recently defined engagement in MBIs as a two-fold construct including *physical engagement* (i.e. session attendance and engagement in recommended between-session mindfulness practices) and *psychological engagement* (Banerjee, et al., under review). Psychological engagement comprises: (1) *motivation* to put time aside to participate in the MBI course; (2) *intention* to maintain a personal formal mindfulness practice during and after the MBI course; (3) *commitment* to bringing mindfulness into daily life; (4) the *belief* that practicing mindfulness will be beneficial to one’s mental health or wellbeing; and (5) the *therapeutic relationship* between the person and the MBI group and teacher.

This model of engagement in MBIs has been tested using path-analysis in a study evaluating a brief online MBI in a student population. Physical and psychological engagement were identified as two distinct constructs and trait rumination and worry were found to independently predict psychological disengagement in the MBI which in turn predicted reduced changes in trait mindfulness during the intervention. Physical engagement on the other hand did not emerge as a significant predictor of changes in mindfulness. Thus, trait rumination and worry appeared to increase risk of psychological disengagement from the MBI which may in turn appeared to hinder learning mindfulness. These findings suggest that MBIs should be designed to promote psychological engagement in particular and that participants with high baseline scores

on measures of repetitive negative thinking could be targeted for additional guidance to support continued engagement.

However, a limitation with this study was the absence of an active control condition. It could be argued that high levels of trait rumination and worry might hinder engagement in any health intervention, particularly self-help interventions that may require greater levels of personal motivation. For example, an RCT on efficacy of self-directed prevention intervention workbooks for depression revealed that in the absence of a trained professional factors such as, rumination may form a barrier to participants' ability to identify and dispute negative thoughts (Haefel, 2010). In other words, findings from the study by Banerjee et al. (under review) may tell us little about barriers to engaging in MBIs specifically as they may be more generally applicable to any brief online health-related intervention. The aim of the current study is to address this limitation.

Rumination (Nolen-Hoeksema, 1991) and worry (Borkovec et al., 1998) are repetitive negative thinking styles that are associated with negative mood (Watkins et al., 2005). Although these repetitive negative thinking styles share the same processes, they involve different content (Watkins et al., 2005). Rumination is characteristic of major depressive disorder (MDD) and predicts its onset and maintenance (Spasojevic & Alloy, 2001; Nolen-Hoeksema, 2000). It is significantly associated with cognitive avoidance, behavioural avoidance and higher disengagement from problems (Moulds et al., 2007; Hong, 2007). Worry is considered to be a key feature of generalized anxiety disorder (GAD) (American Psychiatric Association, 2013). It is conceptualized as an avoidance strategy associated with low perceived coping effectiveness (Newman & Llera, 2011; Borkovec, 1994; Hong, 2007). Since avoidance is an empirically established predictor of disengagement from several psychotherapies (Kim et al., 2012;

Saatsi et al., 2007; Edelman et al., 1995), rumination and worry may be associated with disengagement from any health-related behaviours.

As noted in previous studies (Banerjee, et al., under review), mindfulness-based self-help (MBSH) interventions are particularly well suited to addressing questions of engagement in ‘pure’ mindfulness-based interventions. MBSH eliminates several non-specific factors present in face-to-face MBIs, such as support from the group members and mindfulness teacher, which may enhance engagement.

The current study tests the model of engagement (Banerjee, et al., under review) shown in Figure 6.1 and compares this to a well-matched active control condition (a listening to classical music intervention). Listening to music has been found to be effective in reducing stress, depression and anxiety (Thoma et al., 2013). This active condition allows us to control for both specific (e.g. intervention medium) and non-specific effects of MBSH (e.g. expectations of benefit). We hypothesise that: (1) baseline levels of perseverative thinking (rumination and worry), will predict physical and psychological disengagement with MBSH; (2) this relationship will not be established in the control condition; and (3) greater physical and psychological engagement will be associated with increased trait mindfulness in the MBSH condition.

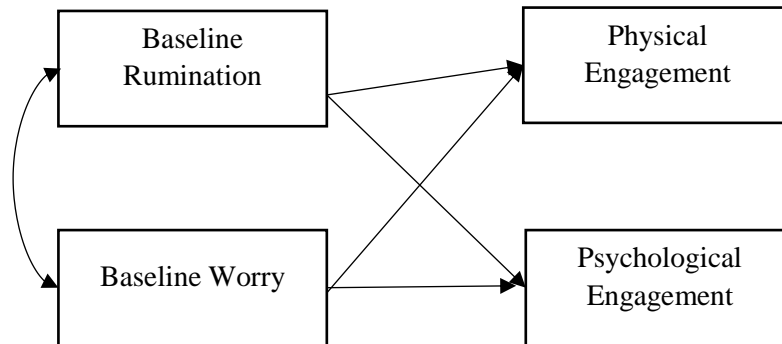


Fig. 6.1 The theoretical model of the relationship between trait rumination, worry, and physical and psychological engagement in MBIs.

6.2 Methods

6.2.1 Participants

The final sample consisted of 136 participants, from age 18 to 34 ($M=22.42$, $SD=4.41$), from a university in the South of England. This sample size was deemed satisfactory as it was higher than the acceptable sample to parameter ratio (10:1) in a path-analysis (Jackson, 2003). Ethical approval was obtained from the host university ethics committee. The inclusion criteria were participants had to be (i) a student or member of staff at the host university and (ii) 18 years or older. 77% participants were female, 85% were of white ethnicity and 89% were students while the rest were staff. There were no significant baseline differences in demographic or psychological variables between the two intervention conditions (Table 6.1 and 6.2).

Table 6.1. Demographic characteristics of participants.

	LMO n = 70	LCMO n = 66	Total n = 136	Between- group comparison
<hr/>				
Gender n (%)				
Female	56 (80.0)	49 (74.2)	105 (77.21)	$\chi^2 = 0.64$ p = .42
Male	14 (20.0)	17 (25.8)	31 (22.79)	
Total	70 (100.0)	66 (100.0)	136 (100.0)	
Ethnicity n (%)				
White	57 (81.43)	59 (89.39)	116 (85.29)	$\chi^2 = 1.17$ p = .19
Non-white	13 (18.57)	7 (10.61)	20 (14.71)	
Total	70 (100.0)	66 (100.0)	136 (100.0)	
Role in university n (%)				
Student	63 (90.0)	56 (84.85)	119 (87.5)	$\chi^2 = 0.82$ p = .44
Staff	7 (10.0)	10 (15.15)	17 (12.5)	
Total	70 (100.0)	66 (100.0)	136 (100.0)	
Age mean (sd)	22.50 (4.24)	22.33 (4.62)	28.61 (9.16)	t= 0.22, p=.83
<hr/>				
Note: LMO: Learning mindfulness Online; LCMO: Learning Classical Music Online				

Table 6.2. Between-group differences on study variables at baseline.

	LMO (n = 70)	LCMO (n = 66)	Between-group t (p)
Rumination (RRS)	50.96 (11.87)	50.71 (12.28)	0.12 (0.73)
Worry (PSWQ)	51.03 (8.61)	50.17 (8.61)	0.49 (0.37)
Mindfulness (FFMQ)	63.66 (7.11)	59.76 (9.43)	1.53 (0.62)

Note: RRS: Ruminative response Scale, PSWQ: Penn State Worry Questionnaire, FFMQ: Five Facet Mindfulness Questionnaire

6.2.2 Interventions

Learning Mindfulness Online: There are six sections in the Learning Mindfulness Online (LMO) intervention (Cavanagh et al., 2013). The *Daily Mindfulness Practice* page comprised of a choice of male and female voices for a 10-minute guided mindfulness meditation practice. The other pages included information on *Everyday Mindfulness Activities* (such as mindful tooth brushing and eating), *Daily Practice and Everyday Mindfulness Activities FAQ* (including information on range of emotions and feelings, both good and bad that may result from mindfulness practice), *My Daily Journal* (providing opportunity to record participants' thoughts and feelings as they progress through the intervention), a *Welcome* section and *Help and Assistance*. The *Study Information* section provided vital information on participation in the study with contact details of the researchers and University counselling services (see Cavanagh et al, 2013 for details). Participants were given access to the program for 14 days.

Listening to Classical Music Online: An intervention analogous in structure, style and form to LMO was developed using the same online platform. The style and wording of the intervention material was kept as close as possible to the LMO online site, including

introductory psychoeducational written and video information on the wellbeing benefits of listening to classical music. The intervention, Listening to Classical Music Online (LCMO) comprised of six sections. The *Welcome* page was followed by the *Daily Classical Music Listening* page that had a choice of two classical music extracts of 10-minutes duration (to match the number and length of mindfulness audio recordings on the LMO site). The other pages were *Why Listen to Classical Music*, *Everyday Musical Activities* (bringing music into daily activities such as, brushing, eating and walking), *Daily Practice and Everyday Mindfulness Activities FAQ* (including information on emotions and feelings, both good and bad that may arise from listening to music), *My Daily Journal* (for recording participants' thoughts and feelings as they progress through the intervention), a *Help and Assistance* page and a *Study Information* page. Participants were given 14 days' access to this intervention. This intervention was deemed as a control condition comparable to LMO as several studies have reported the effectiveness of music therapy in mental health conditions such as depression (Erkkilä et al., 2011). Moreover, classical music therapy has also been shown to be significantly reduce depressive symptoms (Castillo-Pérez et al., 2010).

6.2.3 Measures

Five facet mindfulness questionnaire – short form (FFMQ-SF; Bohlmeijer et al., 2011)

The FFMQ-SF is a 24-item self-report scale, with each item rated on a 1 to 5 scale, where 1 is never or very rarely true and 5 is very often or always true. It assesses five facets of mindfulness: observing, describing, acting with awareness, non-judging and non-reactivity and subscales have good internal consistency in this study ($\alpha = 0.89$). However, a recent hierarchical confirmatory factor analysis revealed that in a non-meditative sample, a 4 factor FFMQ (FFMQ – 'observe' subscale) is preferred over a

five-factor score (Gu et al., 2016). Hence, the ‘observe’ scale was omitted from the total score of FFMQ.

Ruminative Responses Subscale (RRS; Nolen-Hoeksema & Morrow, 1991)

The RRS is a subscale of the response styles questionnaire (RSQ; Nolen-Hoeksema & Morrow, 1991) with 22 items, each item rated on a 4-point scale, where 1 is almost never and 4 is almost always. The internal consistency in this study (Cronbach's α) is 0.95.

Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990)

The PSWQ consist of 16 items, each rated on a 5-point scale, where 1 is not at all typical of me and 5 is very typical of me. The PSWQ had moderate internal consistency in this study ($\alpha = 0.70$).

Measures of Engagement

The measures of engagement in MBIs developed by Banerjee et al., (under review) were used in the current study.

Physical Engagement – Physical engagement was defined as the frequency of mindfulness practice and this was measured using two self-report questions. The items were “on how many days [over the past two weeks] did you practice mindfulness meditation at least once?” and “how many times on an average did you practice mindfulness meditation each day?”. The total physical engagement score was calculated by multiplying these two figures together (i.e. physical engagement = number of days on which mindfulness was practiced x number of times per day mindfulness was practice).

Psychological Engagement – The psychological engagement questionnaire comprises four items: (1) Motivation (*[over the past two weeks], how motivated were you to set time aside to use the mindfulness online course?*); (2) Intent (*how likely do you think you are to engage in mindfulness?*); (3) Commitment (*how often did you bring mindfulness principles into your life each day?*); and (4) Belief (*how effective do you think mindfulness is in helping to deal with stressful situations?*). Items were rated on a five-point scale ranging from 1 (not at all) to 5 (completely). This scale in this study had high internal consistency ($\alpha = 0.84$).

6.2.4 Procedure

Participants were given the link to the baseline questionnaires (hosted by <https://www.onlinesurveys.ac.uk/>). On completion, the participants were randomized to either LMO or LCMO conditions. Participants were randomized using random numbers generated by an online program. Upon randomization, participants were given access to the LMO or LCMO sites through the university's virtual learning environment was provided. After the 14-day intervention period, participants were sent the post-intervention questionnaire link.

6.2.5 Data Analysis

Data were analysed using SPSS (Windows version 22.0) and AMOS Graphics (version 22.0; Arbuckle, 2006) software. As a first step, correlations between all the variables were examined within each intervention arm. Second, model fit for the LMO condition was evaluated using several fit indices and convergence between findings was assessed (Byrne, 2010), namely, the Satorra-Bentler chi-square, the root mean square error approximation (RMSEA), the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI) and the comparative fit index (CFI). The Satorra-Bentler chi-square

is a chi-square fit index that corrects the statistic under distributional violations by determining whether the value of this statistic is less than twice the model's degrees of freedom (Kline, 2005). An RMSEA value of less than 0.08 indicates an adequate fit. The closer the values of GFI and AGFI indexes are to 1 the better the fit. The CFI measures the proportional improvement in fit by comparing a hypothesized model with a more restricted baseline model. The CFI indexes also range from 0 (absolute lack of fit) to 1 (perfect fit). Third, the paths in the model for the LCMO condition were investigated. Finally, the models for each intervention were compared using path-by-path comparison in order to examine whether, as hypothesised, the data were a significantly better fit to the model in the LMO condition in comparison to the LCMO condition. A chi-square difference test using AMOS Graphics determined the difference between the models in the two conditions. Additionally, a path-by-path test determined the differences in each of the path in the model. Moreover, in order to test the hypothesis that greater physical and psychological engagement will be associated with increased trait mindfulness in the MBSH condition, a separate model was tested that analysed the paths between physical and psychological engagement in the LMO condition and increase in trait mindfulness. A similar model was not tested for the LCMO condition because of several reasons. First, this analysis does not test any of the research questions indicated in section 6.1. Moreover, the LMO intervention incorporates practices aimed to increase trait mindfulness (Cavanagh et al., 2013). Additionally, there is sufficient evidence suggesting that the LMO condition increases trait mindfulness (Cavanagh et al., 2013; Banerjee et al., under review). However, no evidence suggests that listening to classical music could increase trait mindfulness.

6.3 Results

Of the one-hundred and thirty-six participants recruited for this study, one-hundred and eight participants (79%) participants completed the post intervention measures, of which 60 participants were in the Learning Mindfulness Online (LMO) condition while 42 were in the Listening to Classical Music Online (LCMO) condition. The study flowchart is presented in Fig. 6.2. The mean age of these participants was 22.51 years ($SD = 4.46$, range = 18 – 34), 78% of completers were female, 83% were of white ethnicity and 88% were students. There were no significant differences in gender, ethnicity, role in university, age, baseline trait mindfulness, baseline trait rumination or baseline trait worry between the completers and non-completers.

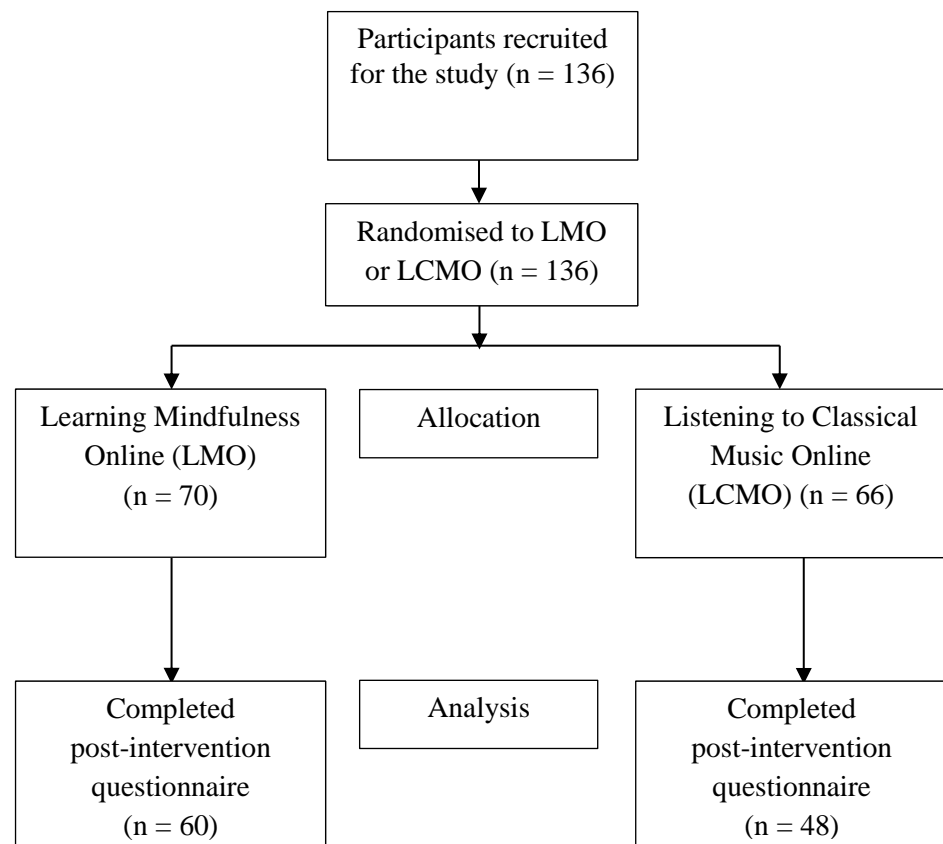


Fig. 6.2 Study flow diagram.

Descriptive statistics and correlation coefficients between study variables within each intervention condition are shown in Table 6.3 and 6.4 respectively.

Table 6.3: Descriptive statistics (range, means and standard deviation) and Pearson's correlation coefficients of the measures of participants in the LMO condition who completed post-trial questionnaires (n=60)

	Mean						
	(SD)	Range	1	2	3	4	5
1 Baseline FFMQ-SF	62.46 (7.55)	42 – 85	-				
2 Baseline RRS	50.98 (11.24)	25 – 75	-.13	-			
3 Baseline PSWQ	47.15 (9.31)	22 – 74	-.15	.26*	-		
4 Physical Engagement	5.23 (2.00)	1 – 9	.42**	-.41**	-.28*	-	
5 Psychological Engagement	3.48 (.71)	2.25 – 4.5	.03	-.39**	-.66**	.32*	-

Note: ** $p < 0.01$, * $p < 0.05$

FFMQ-SF= Five facet mindfulness questionnaire – short form (Bohlmeijer et al., 2011);

PBAW=Positive Beliefs about Worry (Wells & Cartwright-Hatton 2004); *PBRS*=Positive beliefs about rumination scale (Papageorgiou & Wells 2001); *PSWQ*=Penn State Worry Questionnaire (Meyer et al., 1990); *RRS*=Ruminative Responses Subscale (Nolen-Hoeksema & Morrow, 1991)

Table 6.4: Descriptive statistics (range, means and standard deviation) and Pearson's correlation coefficients of the measures of participants in the LCMO condition who completed post-trial questionnaires (n=48)

	Mean						
	(SD)	Range	1	2	3	4	5
1 Baseline FFMQ-SF	60.25 (7.97)	33 – 79	-				
2 Baseline RRS	47.78 (12.21)	20 – 72	-.16	-			
3 Baseline PSWQ	46.13 (6.87)	35 – 76	-.03	.42*	-		
4 Physical Engagement	5.58 (2.04)	1 – 12	.09	-.8	-.09	-	
5 Psychological Engagement	3.35 (.91)	1 – 4.75	-.10	-.11	-.27	.09	-

Note: ** $p < 0.01$, * $p < 0.05$

FFMQ-SF= Five facet mindfulness questionnaire – short form (Bohlmeijer et al., 2011);

PBAW=Positive Beliefs about Worry (Wells & Cartwright-Hatton 2004); *PBRs*=Positive beliefs

about rumination scale (Papageorgiou & Wells 2001); *PSWQ*=Penn State Worry Questionnaire

(Meyer et al., 1990); *RRS*=Ruminative Responses Subscale (Nolen-Hoeksema & Morrow, 1991)

6.3.1 Path Analysis Findings

Mindfulness (LMO) Condition

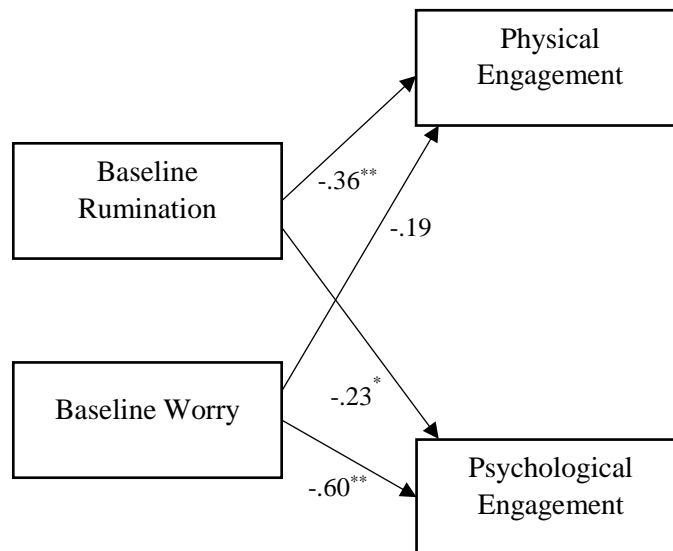


Fig.6.3 The empirical model of factors associated with engagement in the mindfulness condition along with the significant standardised path coefficients are presented. $N = 60$; ** $p < 0.01$; * $p < 0.05$

To test hypothesis 1, four observable variables were tested separately for the model shown in Figure 6.1. Table 6.5 shows that there was an excellent fit between the model and the data in the LMO condition, although there was a non-significant path between baseline worry and physical engagement ($\beta = -.19$, $p = .12$).

The model was updated by eliminating the non-significant path found in the LMO condition. This yielded an excellent fit to the data in the LMO condition, however, the initial model was a better fit as it had lower Satorra-Bentler chi-square and RMSEA values, a value of AGFI closer to 1 and an almost perfect fit of CFI value (see Table 6.5). The model as well as standardized coefficients and R^2 values are shown in Figure 6.2, with R^2 values shown above each endogenous variable. In the LMO condition,

rumination yielded statistically significant path coefficients to physical engagement (explaining 36% of the variance of this variable) with higher levels of rumination related to lower levels of physical engagement and to psychological engagement (explaining 23% of the variance). Worry, on the other hand yielded a statistically significant path coefficient to psychological engagement (explaining 60% of the variance). In addition, both physical and psychological engagement yielded statistically significant path coefficients for pre- to post-MBSH changes in mindfulness (explaining 27% and 58 % of the variance respectively).

Table 6.5 Fit indices for the path models (shown in Figures 1 and 2)

Condition	Model	χ^2 (df)	$\chi^2 \div (df)$	RMSEA (90 % CI)	GFI	AGFI	CFI
Mindfulness	Initial	0.49 (1)	0.49	0.00 (0.00 –	0.99	0.96	1.00
Condition	Model			0.31)			
(LMO)	(Figure 6.2)						
	Final	2.93 (2)	1.47	0.89 (0.00 –	0.98	0.88	0.98
	Model			0.29)			

Note: Root Mean Square Error of Approximation(RMSEA) of .05 or less, goodness of fit index (GFI), adjusted GFI (AGFI) and Comparative Fit Index (CFI) >.9 indicates good fit.

Music (LCMO) Condition

No comparable effects were yielded in the LCMO condition as none of the paths were significant (Fig. 6.4), however, a chi-square test indicated that the model was a good fit ($\chi^2 = 0.43$, $p = 0.81$).

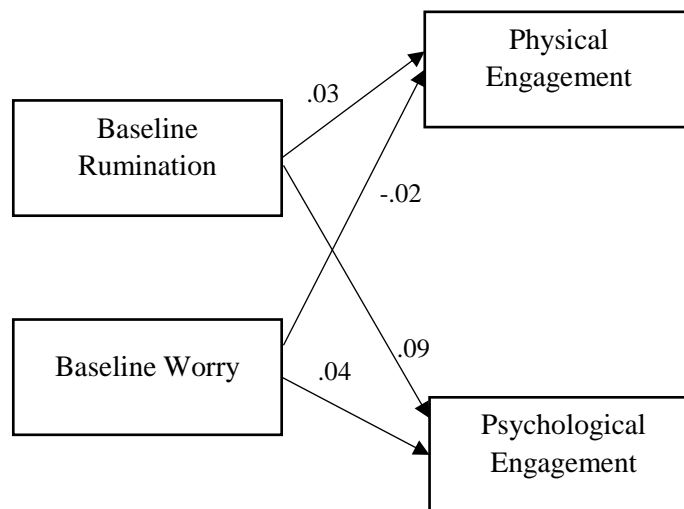


Fig. 6.4 The empirical model of factors associated with engagement in the mindfulness condition along with the significant standardised path coefficients are presented. $N = 48$; ** $p < 0.01$; * $p < 0.05$

6.3.2 Model Comparison Findings

Constraining the structural parameters in the path analysis to be equal across the two groups, the model of engagement (Figure 6.1) in the LMO condition was significantly stronger ($\chi^2 = 13.15$, $p = .04$) than the model in the LCMO condition, showing that the hypothesised model was a significantly better fit to the data in LMO than in the LCMO condition. Additionally, a path-by-path analysis was done to determine the difference in each paths of the model in the two conditions, results are reported in Table 6.6. This

revealed that the paths between trait rumination and physical engagement; and trait worry and psychological engagement were significantly different in the LMO and LCMO conditions.

Table 6.6: Path-by-path analysis of the model in Figure 6.1

Paths	Mindfulness Condition		Music Condition		z-score
	Standardized	p-value	Standardized	p-value	
	Regression		Regression		
	Weights		Weights		
Trait Rumination to Physical Engagement	-0.36	0.00	0.03	0.82	2.07*
Trait Worry to Physical Engagement	-0.19	0.12	-0.02	0.88	0.66
Trait Rumination to Psychological Engagement	-0.59	0.02	0.04	0.53	1.91
Trait Worry to Psychological Engagement	-0.23	0.00	0.09	0.81	3.01**

Notes: ** p-value < 0.01; * p-value < 0.05

6.3.3 Engagement and Mindfulness

To test the third hypothesis, a path-analysis of the two forms of engagement and improvement in trait mindfulness was conducted. This revealed both physical and psychological engagement predicted improvement in mindfulness.

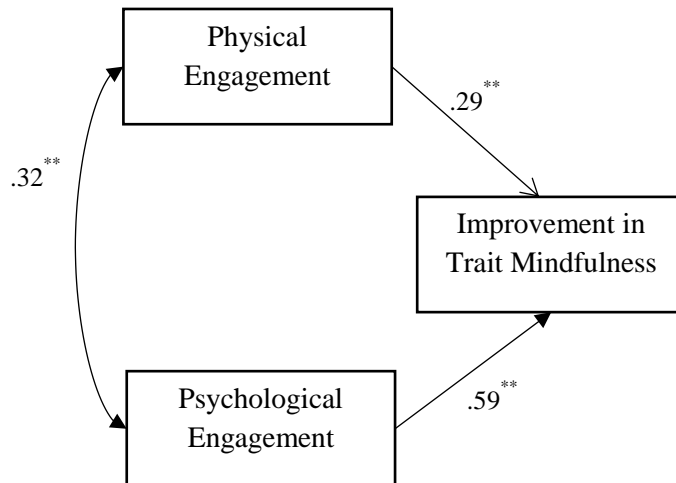


Fig. 6.5 The empirical model of engagement in the mindfulness condition and improvement in trait mindfulness along with the significant standardised path coefficients are presented. $N = 60$; ** $p < 0.01$; * $p < 0.05$

6.3.4 Engagement in the interventions

See Table 6.3 and 6.4 for the means and standard deviations on the physical and psychological engagement measures in the LMO and LCMO conditions respectively. Further details are that 75% of participants reported practicing mindfulness once per day during the LMO intervention period whilst 86% reported listening to classical music once per day during the LCMO intervention period. Participants in the LCMO condition were significantly more physically engaged with the intervention ($t = -3.47$, $p < .01$) than in the LMO condition. The level of engagement (self-report of at least the scale mid-

point) revealed from the psychological engagement questionnaire was as follows:

58.4% participants said that they were psychologically engaged with the mindfulness intervention while 54.2% participants reported being psychologically engaged with the music condition. There were no significant differences in the level of psychological engagement between the two groups ($t=-.55$, $p=.58$).

6.4 Discussion

Mindfulness-based interventions (MBIs) are empirically supported interventions for reducing stress and increasing psychological well-being in the non-clinical population (Chiesa & Serretti, 2009; Khoury, Sharma, Rush & Fournier, 2015) and improving mental health in the clinical population (Hofmann et al. 2010; Piet & Hougaard, 2011; Strauss, Cavanagh, Oliver & Pettman, 2014; Kuyken et al., 2016) and there is also growing evidence supporting the effectiveness of mindfulness-based self-help (MBSH) interventions in increasing mindfulness skills and reducing depression and anxiety symptoms (Cavanagh et al., 2014). However, research into barriers to engagement in MBIs is in its infancy. The aim of this study was to investigate the factors uniquely associated with engagement in a brief MBSH intervention.

The study hypotheses were supported. Trait rumination predicted both physical and psychological disengagement from MBSH and trait worry predicted psychological disengagement from MBSH. However, we found that trait rumination and worry did not predict disengagement with the classical music intervention (LCMO). In other words, findings suggest that trait rumination and worry may play a specific role in engagement in mindfulness-based interventions, rather than a general role in engagement in any type

of intervention. Moreover, physical and psychological engagement in MBSH predicted improvements in learning mindfulness during the course of the intervention.

6.4.1 Findings in Context

Our findings suggest that participants with higher levels of trait rumination and worry may be more likely to disengage from MBSH interventions. This finding is in agreement with previous quantitative studies that have reported similar effects (Banerjee, et al., under review; Crane & Williams, 2010). The conflict between habitual repetitive thinking styles and decentred mindful awareness experiences by participants of MBIs has also been identified in qualitative studies. A grounded theory on mindfulness practice reported that one of the main reasons participants disengaged was the urge to “do” rather than to “be” (Langdon et al. 2011). This finding is theoretically meaningful as habitual perseverative thinking styles, such as rumination and worry, are antagonistic to the decentering processes involved in mindfulness (Wells, 2005) and share an inverse relationship (Brown & Ryan, 2003). Nevertheless, this finding raises a crucial issue concerning engagement in MBIs. Increasing mindfulness skills reduces the uncontrollability of analytic ruminative thinking (Raes & Williams, 2010) and MBIs bring positive health outcomes by reducing rumination and worry (Gu et al., 2015). Since it may be this precise mechanism of change in MBIs that hinders the process of engaging in mindfulness, this would suggest that participants who could benefit the most from engaging in MBIs may, paradoxically, tend to disengage from the intervention before they are able to experience the benefits.

Contrary to results of our previous study (Banerjee, et al., under review), this study suggests that physical engagement in the MBSH intervention also predicted improvements in mindfulness during the course of the intervention. This is consistent with research finding that formal mindfulness meditation exercises (such as, body scan

and sitting meditation) are significantly associated with improvement in most facets of mindfulness (all but *describing*) (Carmody & Baer, 2008). The benefits of formal mindfulness practice are also highlighted in a recent randomised controlled trial of participants with a history of at least three episodes of major depression reported that formal mindfulness practice is negatively associated with hazard of relapse to depression (Crane et al., 2014). Moreover, other studies have reported that reductions in positive effects of mindfulness, such as reduction in vulnerability to depression, in MBIs may be driven mainly through regular and consistent practice, and that sudden cognitive insights alone are unlikely to lead into lasting effects (Ietsugu et al., 2016). However, to the best of our knowledge no published studies have investigated the relation between amount of formal practice in MBSH and improvements in mindfulness. Our study finding suggests that regular mindfulness meditation practice in MBSH cultivates mindfulness skill in everyday life.

Interestingly, psychological engagement also had strong effects in improving trait mindfulness. This implies that being motivated to set time aside for mindfulness, intending to continue engaging in mindfulness, being committed to bringing mindfulness principles to daily life and believing in the effectiveness of the MBSH intervention significantly improved mindfulness skills. Thus, in addition to the experience of mindfulness meditation (*meta-cognitive insight*), the '*feeling of knowing*' (Teasdale, 1999; p. 147) about mindfulness also contributes to the improvement in trait mindfulness. This finding fits with results from the open-trial path-analysis study (Banerjee, et al., under review). It also provides evidence for the theoretical idea that engagement in MBIs is multi-faceted (Kabat-Zinn, 2003). Thus, highlighting the importance of measuring both physical and psychological engagement in mindfulness

as formal mindfulness meditation practice may only be the ‘map’ rather than the ‘territory’ of mindfulness (Kabat-Zinn, 2003, p. 147).

Consistent with the previous finding (Banerjee, et al., under review), physical and psychological engagement had a low (5.65%) shared variance. This suggests that it is possible to be psychologically engaged with mindfulness but not engage with formal meditation practice and *vice versa*. Our findings could suggest that *meta-cognitive knowledge* and *meta-cognitive insight* (Teasdale, 1999) of mindfulness may only be marginally associated with each other. Meta-cognitive knowledge could be described as *knowing* that thoughts are not always accurate whilst meta-cognitive insight is *experiencing* thoughts as events. Hence some knowledge of mindfulness may be developed without physically practising mindfulness. Future studies can examine this effect in clinical populations.

6.4.2 Limitations and Future Research

The sample of this study consisted of mainly young adults of the same university. This may limit the generalizability of the findings. Since the mindfulness intervention used in this study was brief and offered limited content, the findings may be limited to engagement in brief mindfulness-based self-help (MBSH) interventions. However, since MBSH excludes non-specific aspects of engagement such as, support from group members and supportive mindfulness teacher, it is an effective test of engagement in learning mindfulness *per se*. The finding that physical and psychological engagement in MBIs share only a small variance is only reflective of a non-clinical population and a brief, two-week MBSH intervention. There is some evidence consistent with our findings highlighting the association of physical engagement in MBSR among the clinical population (Carmody & Baer, 2008). Future studies can investigate the

differential associations of physical and psychological engagement on the beneficial effects of standard MBIs (i.e. MBCT/MBSR) in clinical populations.

‘Therapeutic relationship’ was excluded from our measure of psychological engagement as this the study included no therapist contact. However, emerging evidence suggests that it is possible to develop a meaningful relationship with self-help interventions (Cavanagh & Millings, 2013) through the relationship built between the reader and the author (e.g. how we imagine the author to be, feeling understood by them). Future research could identify methods of quantifying therapeutic relationship in the context of MBSH and investigate its effects on improvements in trait mindfulness.

No objective physical engagement measures were obtained. As with any self-report measures, the responses on the physical engagement scale may be influenced by social-desirability effects. Technology could be used to objectively monitor level of physical engagement in the online intervention in future studies.

6.4.3 Clinical Implications

This study has identified trait rumination and worry as barriers to engagement specific to MBIs. Previous research has found similar associations (Banerjee, et al., under review; Crane & Williams, 2010). Hence incorporating psychoeducation on how rumination and worry may interfere with engagement in MBIs is crucial in order to prevent disengagement of the participants who might need it the most.

The findings suggesting that psychological engagement has a strong association with improvement in pre-post mindfulness in the non-clinical population may have implications in adapting MBIs for such participants. Since several qualitative studies point out time commitment to practice meditation as a hurdle of engagement in MBIs

(Wyatt et al., 2014), shorter practices aimed at bringing mindful awareness to daily life activities could be supported in the non-clinical population.

6.5 Conclusion

This study suggests that trait rumination and worry may act as specific barriers to engaging in mindfulness-based interventions, which in turn may impede improvements in mindfulness. This is despite the fact that people with high levels of trait rumination or worry are the very people who might benefit most from MBIs. Findings pave the way for future research exploring ways of optimizing engagement in MBSH specifically but also in MBIs more generally.

Chapter 7: General Discussion

“The only solutions that are ever worth anything are the solutions that people find themselves.”

— Satyajit Ray

General Discussion

Although extensive research has investigated the effectiveness of mindfulness-based interventions (MBIs) (for example, Kuyken et al., 2016; Spijkerman, Pots, & Bohlmeijer, 2016; Strauss, Cavanagh, Oliver, & Pettman, 2014), there is little research examining engagement in MBIs. Several qualitative studies on MBIs have highlighted the challenges of engaging in mindfulness-based practices with some evidence of negative consequences for some of the practices of mindfulness, such as feeling more distressed (Wyatt et al., 2014). However, surprisingly, these challenges of engagement have not been explored in quantitative research. Additionally, while there is research investigating the beneficial effects of mindfulness practice (for example, Crane et al., 2014), there is limited research exploring the effects of psychological engagement to mindfulness on trait mindfulness. The aim of this thesis was to define engagement in MBIs, identify the factors related to engagement in MBIs and investigate the relationship between engagement in MBIs and changes in trait mindfulness. There were several particularly important and novel findings in relation to this aim: (1) physical and psychological engagement in MBIs are distinct constructs that only share around 5% of their variance, (2) in the non-clinical population, greater psychological engagement is associated with increases in trait mindfulness, physical engagement may also be associated with increases in trait mindfulness, (3) people who tend to ruminate or worry are at particular risk of disengaging with MBIs, paradoxically the very people who might benefit most, and (4) some facilitators of engagement in the non-clinical

population are positive attitude towards engagement, shorter length of practices, becoming more mindful and greater sense of agency over thoughts.

In this General Discussion chapter each of these findings will be discussed in relation to their theoretical implications. This will be followed by discussion of general limitations and strengths of studies in the thesis and a consideration of clinical implications and questions for future research. The chapter will then conclude by drawing together key findings and directions for future research in this important area.

7.1 Engagement in MBIs: The Literature

The systematic review and meta-analysis in Chapter 3 revealed some key findings such as the overall rate of dropout from MBI arm of studies (22.24%) is comparable to dropout rates from other interventions such as cognitive behaviour therapy (CBT; 16.1%), dialectical behaviour therapy (27.1%) and acceptance and commitment therapy (15.4%) (Ost, 2008). Interestingly, systematic examination of the literature revealed that unlike group CBT, the most common reason for dropping out of MBI studies was dissatisfaction with the treatment. However, these results must be interpreted with caution given the small number of studies that reported reasons for dropout. The results from the meta-analysis revealed a paucity of reporting dropouts from the intervention. Studies mainly reported data on participants who failed to provide post-assessment data. Although study dropout was used as a proxy measure for intervention dropout, it has been noted that these two constructs are at least in part independent of each other. For example, a participant might engage in the intervention but not provide post intervention data or vice versa. It is thus, crucial for future MBI studies to provide a more thorough data of intervention dropout in order to develop the science of engagement for MBIs.

7.2. Meaning of engagement in MBIs

“Analogies, it is true, decide nothing but they can make one feel more at home”

– Sigmund Freud

The broader psychotherapy literature highlights several facets of engagement in a therapeutic context, such as attendance at therapy sessions, psychological involvement, homework compliance and the therapeutic relationship (Holdsworth et al., 2014). Surprisingly, in the protocols of MBIs (Kabat-Zinn 1990; Segal et al, 2002), engagement in MBIs have been defined merely as session attendance (for example, Crane & Williams, 2010; Williams et al, 2014; Vollestad, Sivertsen & Nielsen, 2011). One of the primary aims of this thesis was to develop a more comprehensive definition engagement in MBIs. The facets of engagement identified in MBIs interventions were physical engagement (session attendance and engagement in recommended between-session mindfulness practices) and *psychological* engagement. Psychological engagement was defined as involving: (1) *motivation* to put time aside to participate in the MBI course; (2) *intention* to maintain a personal formal mindfulness practice during and after the MBI course; (3) *commitment* to bringing mindfulness into daily life; (4) the *belief* that practicing mindfulness will be beneficial to one’s mental health or wellbeing; and (5) the *therapeutic relationship* between the person and the MBI group and teacher. Within this thesis, this definition was explored only within self-help based MBIs with limited opportunity of building a ‘therapeutic relationship’. Hence the measure of psychological engagement in this thesis consisted of motivation, intention, commitment and belief.

Papers 3 and 4 measured and compared these two forms of engagement through self-report measures. The findings of both studies suggested that physical and psychological engagement in MBIs have low shared variance (5-6%). Thus, engaging physically and psychologically to mindfulness practices maybe classified as separate constructs, highlighting the importance of measuring these two forms of engagement. This finding is theoretically meaningful. Kabat-Zinn (2003) argues that physical engagement or mindfulness meditation practices are only “*the map, rather than the territory*” of mindfulness (p. 147), implying that engagement in mindfulness may have aspects other than practicing meditation. The ‘territory’ in this case could be deeper involvement or psychological engagement in the interventions. Qualitative data in the literature indicates whilst some participants do not follow the protocol-recommended physical practice schedule they are able to employ mindfulness as a ‘*tool for moments of suffering*’ (Cebolla i Martí & Barrachina, 2009, p. 13). A participant exemplified this finding in Paper 2 as,

“It was like learning to swim. You don’t always swim but once you know how to you will never drown. I now know about mindfulness and the being mode, I can use it when I am stressed.”

Hence it may be possible to be psychologically engaged in mindfulness by employing mindfulness principles during difficult times but not regularly practising formal mindfulness meditation. However, a compelling question that arises from these findings is how distinct are the constructs physical and psychological engagement? Experts in mindfulness propose that physical engagement (or practice of mindfulness) has to be long enough to allow participants to grasp the principles of self-regulation and develop autonomy and skill in mindfulness practice (Kabat-Zinn, 1982). This has been reflected in qualitative studies of mindfulness, where ‘grasping core concepts’ of

mindfulness have emerged as a ‘struggle’ in the initial sessions of practice (Wyatt et al., 2014). A possible interpretation could be the differential responsiveness to grasping mindfulness concepts through mindfulness practice in different populations. MBIs were originally developed for the clinical population (see Kabat-Zinn, 1990; Segal et al., 2002). Mental health problems such as depression are often caused, at least in part, by maladaptive habitual cognitive processes such as rumination, that involve repetitive thinking of the content of thoughts (Teasdale et al., 1995). Thus, regular and lengthy mindfulness practices may be crucial, especially in the clinical population, in order to change maladaptive cognitive habitual processes such as rumination and worry and learn to decenter from the content of thoughts. However, it is possible that within the non-clinical population, briefer mindfulness meditation practice may be adequate for learning mindfulness skills, thus, resulting in the mutual exclusivity of physical engagement and psychological engagement. However, this conclusion is tentative and hypothetical. Future research could explore the relationship of physical and psychological engagement in the clinical population to draw definitive conclusions.

A somewhat analogous concept was introduced by Teasdale (1999) that proposed two distinct levels of meta-cognition in relation to learning mindfulness – meta-cognitive knowledge (for example, *knowing* that thoughts are not always accurate) of mindfulness and meta-cognitive insight (for example, *experiencing* thoughts as transient events). Drawing a parallel of this concept with our finding of physical and psychological engagement, it can be argued that psychological engagement reflects meta-cognitive knowledge that thoughts are not facts and may refer to knowing and believing in mindfulness. Physical engagement, on the other hand, may be the means to develop meta-cognitive insight of mindfulness or experience being in the present moment and observing thoughts and feelings non-judgmentally as they come and go.

The studies in this thesis has shown that physical and psychological engagement share only 5-6% variance. Hence, the constructs of physical and psychological engagement in MBIs are distinct and the definition of engagement in MBIs must incorporate both these constructs.

7.2.1 Implications and Future Directions

There are several research and clinical implications of the distinction between physical and psychological engagement. First, this finding suggests there are distinct ways of engaging with mindfulness beyond attending classes as was proposed in the protocols (Kabat-Zinn 1990; Segal et al, 2002). This measurement of engagement is novel to the mindfulness literature. Second, the results highlight the importance of measuring both forms of engagement in mindfulness studies as participants who struggle to physically engage in formal mindfulness practice may be able to psychologically engage in mindfulness (for example, through psychoeducation) and vice versa. However, the concept of mutual exclusivity of physical and psychological engagement has some theoretical implications. First, in order to 1) develop *motivation* to put time aside for mindfulness practice; (2) *intention* to maintain a personal practice; (3) *commitment* to bringing mindfulness into daily life; (4) *believing* that practicing mindfulness will be beneficial to one's mental health or wellbeing one has to first physically engage and practice mindfulness. Hence, it may not be possible to develop psychological engagement without at least some physical engagement in mindfulness. Second, drawing from the concept of 'behaviour experiments' in CBT, it could be argued that meta-cognitive insight is impossible to achieve by merely 'knowing' that thoughts are not facts, experiencing thoughts as transient mental events is necessary. However, according to the concept of behaviour experiments, once meta-cognitive insight is developed, repeating the behaviour is not essential (Bennett-Levy, 2003).

Hence it could be argued that after a certain time of mindfulness practice (that is, once insight is developed), meta-cognitive knowledge or psychological engagement could be maintained in without physical engagement. *Post hoc* analysis was conducted to explore the interactive nature of physical and psychological engagement on the increase in trait mindfulness. Although the results from Papers 3 and 4 did not reveal any significant results, this idea could be explored in future research. However, these conclusions are based on theoretical frameworks and future research is required to explore the extent of physical engagement required to develop psychological engagement in MBIs. Moreover, the current findings of the distinction of physical and psychological engagement in MBIs may be restricted to a healthy population only. Future studies could examine the association between physical and psychological engagement in MBIs in the clinical population.

7.3 Engagement in mindfulness and outcomes

The studies in this thesis were the first to measure physical and psychological engagement in MBIs. It was hence crucial to identify how these measures were associated with trait mindfulness in order to ascertain the importance as well as validity of these measures. Paper 3 revealed that although psychological engagement was associated with increased trait mindfulness, physical engagement had no such associations. However, Paper 4 found that physical engagement was also associated with increase in trait mindfulness. Since the intervention and outcome measures were identical in Papers 3 and 4, it is difficult to draw clear conclusions about these inconsistent results. One explanation could be that Paper 3 was underpowered to detect the effect of physical engagement on improvement in trait mindfulness. These findings, thus, need to be explored in future research.

The role of formal mindfulness meditation has been examined previously in the literature and reveal contrasting findings. A recent RCT reported that formal mindfulness home practice is significantly negatively associated with the risk of relapse in people with a history of depression (Crane et al., 2014). Other studies have reported that engaging in formal practice is associated with reduced rumination, and symptom alleviation in participants in remission of depressive symptoms (Hawley et al., 2014). Contrarily, a review revealed that 11 out of 24 studies examined failed to demonstrate an association between mindfulness practice and outcomes (Vettese et al., 2009). There were substantial differences across the studies included such as, variability in the type of MBI being reviewed, participant group (included non-clinical and clinical), assessment of mindfulness practice (such as, retrospective self-report or daily diary), and quantification of the level of practice (such as, duration versus of practice). For instance, a study in this review with a very small sample ($n=15$), demonstrated inverse relation between practice and outcomes (Carmody et al., 2006). Another study that revealed such inverse relationship in the review used a 10-day intensive retreat format rather than a weekly format (Ostafin et al., 2006). These contrasting findings may suggest that additional factors (perhaps in addition to mindfulness practice) are responsible for therapeutic benefits.

Interestingly, both the empirical papers revealed that psychologically engaging in mindfulness, or being motivated to set time aside for mindfulness practice, intending to continue engaging in mindfulness practice, being committed to bringing mindfulness principles to daily life and believing in its effectiveness, were associated with increase in trait mindfulness. This fits with the idea proposed by Holdsworth et al (2014) that participation in psychological interventions cannot be restricted to the participants' contribution within sessions. Measurement of engagement or participation must include

a measure of participants' voluntary efforts between sessions. More so, for interventions such as MBIs, as participating in MBIs are often described as an "approach to life" (Langdon et al., 2011, p. 271) rather than a discrete health behaviour.

7.3.1 Implications and Future Directions

The finding that engaging psychologically in mindfulness is at least as important as practising mindfulness meditation has several implications. First, this can inform development of adapted forms of MBIs for varied participant groups. MBIs were originally developed for the clinical population (Kabat-Zinn 1990; Segal et al, 2002), however, MBIs delivered to the non-clinical population tend to maintain the intensity and length of mindfulness practices (for example, Cousin & Crane, 2016; Mallya & Fiocco, 2016; Smith, 2014). Unsurprisingly, Paper 2 revealed that when MBIs were delivered to the NHS staff population, intensity and length of practices emerged as a hindrance to engagement. Second, this thesis provides evidence that psychological engagement could enhance trait mindfulness, hence so long as psychological engagement is maintained then less intensive MBIs could be effective, at least in the non-clinical population. This is in agreement with research suggesting that brief mindfulness training can result in positive health outcomes such as, reduced fatigue, anxiety, depression symptoms and enhanced positive affect and mindfulness (Zeidan et al., 2010; Howells, Ivtzan, & Eiroa-Orosa, 2016). However, long-term effects of psychological engagement have not been examined and future research could explore the effect of brief training and psychological engagement in these health outcomes. Third, the findings of chapter 6 highlight the importance of physical engagement to increase trait mindfulness. This is consistent with the notion that physical engagement in mindfulness practice is fundamental in building awareness of thoughts and feelings and shifting focus from the content of thoughts (Segal, Williams, & Teasdale, 2013).

However, this result is inconsistent with the results in Paper 3. Hence, robust conclusions on the importance of physical engagement in mindfulness practice cannot be drawn in this thesis. It is worth noting, however, that the psychological engagement may not be possible without initial physical engagement. For instance, *believing* that mindfulness is effective is difficult if only the rationale of mindfulness is understood and mindfulness is never practiced. Hence this thesis opens interesting research ideas regarding the differential effects of each form of engagement and the association between the two. Fourth, the psychometric properties of the psychological engagement scale could be tested, including cross-validating the scale with objective measures of engagement. Finally, extending the model of engagement and the factors related to it to the clinical population and traditional MBIs.

7.4. Perseverative thinking styles and mindfulness

“Buddhas also have to be swept away, because the door can become a hindrance if you cling to it.”

— Osho,

“To be, or not to be: that is the question”

— William Shakespeare (Hamlet, Act III, Scene I)

Paper 1 revealed that although the rate of dropout from MBI studies were similar to that from CBT studies, the primary reported reason for dropping out of MBI studies was dissatisfaction with the intervention. This finding highlighted the importance of researching the causes of this dissatisfaction and consequently disengagement from MBIs. One randomised controlled trial (RCT) exploring the factors associated with engagement in an 8-week MBCT intervention revealed that participants with higher cognitive reactivity, brooding and depressive rumination found it particularly difficult to

engage with MBCT (Crane & Williams, 2010). The authors highlighted the significance of the finding that rumination may lead to dropout, although MBIs are instrumental in reducing rumination and worry (Gu et al., 2014). Thus, the participants that are most likely to benefit the most from MBIs may also be the most likely dropout. Surprisingly, this finding had not been explored further in the literature. To the best of our knowledge, Paper 3 was the first empirical study that investigated the effect of rumination and worry on physical and psychological engagement in MBIs.

The results of Paper 3 revealed that consistent with our hypothesis, rumination and worry predicted psychological disengagement while rumination predicted physical disengagement from the MBSH intervention. One limitation of this study was the lack of control conditions. It is crucial to have a comparable active control condition to draw definitive conclusions as high levels of trait rumination and worry could hinder engagement in any health intervention, particularly self-help interventions that may require greater levels of personal motivation. To address this limitation, Paper 4 included a Learning Classical Music Online (LCMO) condition, which was designed to be an active control condition. Results were consistent with Paper 3 and revealed that, rumination and worry both predicted psychological disengagement in the (MBSH), while only rumination predicted physical engagement. However, there were no such relationships in the classical music condition. This indicates that habitual perseverative thinking styles such as rumination and worry form barriers for engagement specifically for MBIs. Interestingly, these findings were also reflected from the participants of the qualitative analysis in Paper 2. *Habitual perseveration* emerged as a key theme of hindrance to engagement. For example, “*I know it (mindfulness) is supposed to be good for you, but I am a do-er. I like to think about my problems and sort them out. I found it difficult to sit through the practices, so I gave up*”. Additionally, it was revealed in

Paper 2 that participants occasionally used the mindfulness meditation time to engage in maladaptive perseverative thinking. For example, *“to be honest, I sometimes used the meditation time to mentally make my to-do list”*. This finding is critical as it indicates that disengaged MBI participants may not only not benefit from mindfulness but may also have negative outcomes as a result of engaging in habitual perseveration. This is consistent with finding of another qualitative paper that revealed that mindfulness meditation practice led some participant to feel more distressed, as they became aware negative feelings that were difficult to tolerate and distressing thoughts such as, memory of childhood abuse, were triggered (Finucane & Mercer, 2006).

There may be several explanations of why ruminators and worriers may find it difficult to engage in MBIs. Rumination (Nolen-Hoeksema, 1991) and worry (Borkovec et al., 1998) are forms of perseverative thinking that are implicated in the maintenance of, respectively, depression and generalized anxiety disorder (Kertz et al., 2015). Forming new adaptive cognitive habits are often considered the “best antidote” to changing these maladaptive habits (Hertel, 2004, p. 208). Mindfulness is one such adaptive habit and is often described as a tool to *“stop the rollercoaster”* of repetitive thoughts (Wyatt et al., 2014 p.221). However, perseverative thinking styles are resistant to change (Watkins & Nolen-Hoeksema, 2014) leading to difficulties in engaging in MBIs. Moreover, perseverative thinking styles, such as rumination and worry, are antagonistic to the decentering processes involved in mindfulness (Wells, 2005), hence making it difficult to shift to the mindful being mode. In addition, according to the control theory, perseverative thinking styles, such as rumination, relapses in the absence of immediate environmental demands (Martin & Tesser, 1996). Long mindfulness meditation practices may provide time to the participants where they are not in the ‘doing’ mode, thus removing immediate environmental demands. This lack of

environmental demands may result in a relapse of perseverative thinking styles, which in turn, could exacerbates distress (Nolen-Hoeksema, Wisco & Lyubomirsky, 2008). This increased distress could then lead to disengagement. Additionally, Paper 2 revealed that engaging in mindfulness practice triggered negative thoughts (and likely negative mood) in many participants. This is similar to findings of a meta-synthesis analysis that revealed that practising mindfulness triggered low mood which was one of the ‘biggest challenges’ of engaging in MBIs (Wyatt, 2014 p. 224). According to the goal-habit framework, perseverative thinking, such as rumination, is triggered by contextual cues such as, negative mood (Watkins & Nolen-Hoeksema, 2014). Thus practising mindfulness meditation could have led to low or negative mood which in turn could trigger perseverative thinking. As argued earlier, perseverative thinking could lead to distress (Nolen-Hoeksema et al., 2008) and thereby facilitate disengagement.

7.4.1 Implications and Future Directions

Our finding has theoretical and clinical implications. One of the crucial implications of this finding is that it highlights a key paradox in the field of mindfulness. Studies show that MBIs result in positive outcomes through reducing rumination and worry (Gu et al., 2014; Desrosiers, Vine, Klemanski & Nolen-Hoeksema, 2013). Thus, MBIs could offer most to the participants with higher rumination and worry. However, our findings reveal that those who can benefit the most from MBIs tend to disengage from the intervention. This could be addressed clinically by introducing psychoeducation on rumination and worry in MBI courses, letting participants know that the mind may get caught up in rumination/worry during mindfulness practice, particularly when people are new to practicing. Second, our study findings are restricted to the healthy population. However, there is some evidence that rumination is associated with attrition from MBIs in people with a history of depression

(Crane & Williams, 2010). This could be further explored as participants in the clinical population may have higher ruminative and worrying tendency (Roelofs et al., 2008). Third, effects of other cognitive tendencies that are antagonistic to mindfulness, such as, avoidance coping and experiential avoidance (Mitmansgruber, Beck, Höfer, & Schüßler, 2009; Kashdan, Barrios, Forsyth, & Steger, 2006; Weinstein, Brown, & Ryan, 2009), on engagement in MBIs could be explored.

7.5 Facilitators of Engagement in MBIs

In addition to the barriers of engagement in MBIs, this thesis also identified the facilitators of engagement Paper 2 among healthcare professionals. The first facilitator was positive attitude towards MBIs. Being motivated to learn techniques to reduce stress, a perception of being mindful and positive information about mindfulness contributed towards an enthusiastic attitude towards mindfulness. This could be linked to psychological engagement in MBIs (Paper 3 and 4) as psychological engagement measured the motivation of participants to set time aside for mindfulness. Thus, being motivated to engage in MBIs could increase psychological engagement and thereby result in greater pre-post improvements in trait mindfulness. Shorter mindfulness practices, such as the 3-minute breathing space, that could allow fitting mindfulness to the busy schedule of the participants aided engagement in MBIs. This may suggest that shorter practices might be particularly to promote initial engagement (cf. person-based cognitive therapy; Chadwick, 2006) as longer practices may be overwhelming when the mind is busy or distressed. This finding is consistent with other qualitative studies that have reported that participants find the shorter practices are more beneficial especially in times of distress (Mason & Hargreaves, 2001). This highlights the importance of including shorter mindfulness practices. However, this might need further experimental exploration as the long-term health benefits of shorter mindfulness practices are not known. Interestingly,

becoming more mindful functioned as a facilitator to engagement. For example, “*I realised I am always on auto-pilot. It has become a habit, you know. As the weeks went by I realised I am changing, so I kept going (practising)*”. This is consistent with the finding that mindful *awareness* is a theme recognized by the participants in the studies included in the meta-synthesis (Wyatt et al., 2014). Finally, one of the major barriers found in Paper 2 was an “*increased sense of agency over thoughts*”. This finding is similar to the theme of “a sense of control and choice” reported in the meta-synthesis paper (Wyatt et al., 2014). This is an important facilitator as improved agency over thoughts is frequently applied as a predictor of adaptive psychological functioning and process (Williams & Levitt, 2007). The positive benefits of mindfulness practice could result in greater motivation, intent, belief and commitment to mindfulness leading to increased psychological engagement (see measures of psychological engagement in Papers 3 and 4), thereby acting as a facilitator of engagement.

7.5.1 Implications and Future Directions

The facilitators of engagement have several direct clinical implications. MBIs for the non-clinical population could be designed to include shorter practices intended to increase mindful awareness to daily life activities. However, future research is required to test the effectiveness of shorter mindfulness practices in comparison to longer formal mindfulness meditation exercises (such as, body scan and sitting meditation) which have already been found to be significantly associated with improvement in most facets of mindfulness (Carmody & Baer, 2008). Future research could also explore the effectiveness of MBIs with only shorter practices in comparison to traditional MBIs. This is an important research question as it can have several implications such as decreased participant burden, greater cost-benefits and be more appealing to participants who prefer shorter practices. Additionally, the other facilitators could be incorporated

within MBIs as psychoeducation of the importance of awareness and a sense of agency over thoughts for positive psychological functioning. Future research could empirically evaluate the relative effectiveness of incorporating these facilitators of engagement on engagement and effectiveness of MBIs.

7.6 Limitations and future directions

Although the studies in this thesis attempted to address several interesting research questions, several limitations to this work are also noted.

Generalizability of Results - There are several factors that could limit the generalisability of the findings of this thesis. First, all samples in the studies in this thesis were recruited from the non-clinical population. The barriers and facilitators of engagement in MBIs could be different from the current population. Moreover, all participants included were from the same region. It is possible due to the awareness of mindfulness research within the university or local healthcare institutions, participants had an enhanced positive attitude towards engaging in an MBI. Additionally, the findings of this thesis can be criticised as all the participants that took part in the studies volunteered to do so and hence the finding may not be generalizable to the rest of the population. Future research could investigate the questions of the current thesis in the clinical population and in non-clinical populations recruited from a variety of geographical regions and different backgrounds. This would highlight a more generalizable result of engagement in MBIs and the facilitators and barriers to it.

Limitations of the interventions:

The results of this thesis are limited due to its focus on MBSH interventions only. Learning mindfulness techniques in a face-to-face MBI setting could be very different from learning mindfulness techniques from MBSH. Teasdale (1999) suggests that in

MBIs, metacognitive knowledge is not sufficient to bring about change in level of mindfulness. Becoming more mindful involves developing a conscious cognitive or affective experience or, metacognitive insight of mindfulness. This is reflected in qualitative studies of MBIs. A grounded theory analysis on the experience of participating in an MBI reported that participants described MBIs as a ‘*journey*’ and a ‘*learning path*’ rather than an intervention (Langdon et al., 2011, p. 274). This process may be a result of practising mindfulness techniques and interacting with a mindfulness teacher as well as the group. Interaction with the teacher or group is not applicable to MBSH interventions. Hence this could limit the therapeutic change brought by MBSH interventions. Moreover, Paper 2 reports that a common barrier to engagement in MBSH was emerging negative thoughts and feelings. In a face-to-face MBI setting these negative thoughts and feelings are often addressed by the mindfulness teacher. MBSH interventions lack this support and hence participation in pure MBSH interventions may result in negative outcomes. However, these results may be limited to the sample of NHS staff who experience high levels of minor psychiatric disorder (Wall et al., 1997) and hence, may not be generalizable to the non-clinical population. Interestingly, Paper 3 reported that in a non-clinical population, psychological engagement in MBSH rather than physical engagement resulted in increased trait pre-post mindfulness. Thus, this could indicate that engaging in self-guided MBIs is effective in improving mindfulness in the non-clinical population, while in the clinical population it is essential to engage with more supported, teacher-guided MBIs.

Limitations of the Qualitative Study:

Although thematic analysis was appropriate for the research question in Chapter 4, however, this method itself has some disadvantages. For instance, thematic analysis has limited interpretive power on the narration as it does not take into account the flow of the

narrative of the interviews and analyses and codes each statement separately (Braun & Clark, 2006). Future research could undertake more meticulous qualitative analysis methods, such as, grounded theory (Saldaña, 2011), to highlight the facilitators and hindrance of engagement in MBIs. Additionally, in generating codes, thematic analysis loses the continuity of narration from participants (Braun & Clark, 2006).

Limitations of the Quantitative Studies:

A major limitation of this thesis is the use of self-report measures for engagement. Self-report measures are influenced by social-desirability effects and evidence suggests that individuals have different interpretations of the scales in self-report questionnaires (Austin et al., 1998). Future research could explore physical engagement through objective measurements. Moreover, the psychological engagement questionnaire uses several proxy items in order to ascertain the level of engagement. The use of such proxy measures are criticized in the literature (Tetley et al., 2011), however, it is also argued that involvement or psychological engagement is a covert construct that is difficult to measure without such proxies (Holdsworth et al., 2014).

Mindfulness research is often disadvantaged due to the problems of measuring mindfulness itself. Measurement of mindfulness is exclusively dependent on the results of self-report measures in this study, and at present there are no convincing alternatives (Bergomi et al. 2013). Self-report measures are subject to social desirability effects or response (Vollestad, Sivertsen & Nielsen, 2011). The current mindfulness measurement self-report scales are criticised by researcher as participants' scoring in these scales could be biased by desires (Bergomi et al. 2013). Additionally, it is unknown if the meaning of the items in the mindfulness measurement scales have the same meaning to all participants (Bergomi et al., 2013). Another key limitation of this thesis is the absence of

data from participants that have disengaged physically from the intervention. In order to sufficiently address the question of engagement in MBIs it is critical to obtain information from both sides of the scale. Future qualitative and quantitative research could explore questions related to engagement from those who disengaged or dropped out. However, this thesis does include participants who may have psychologically disengaged from the intervention. This thesis is limited in establishing causal models of engagement. Future empirical work could explore the effect of rumination and worry on engagement in MBIs in an experimental setting. This could be tested in an RCT study where participants' level of rumination could be experimentally increased. Participants could then be invited to engage in a mindfulness meditation practice or an active control (e.g. listening to classical music). The results could then establish a stronger cause-effect relationship between rumination and engagement in mindfulness. Another limitation of this thesis is limiting the investigation to self-help based MBIs. Although this was a deliberate research choice in order to eliminate the effects of group or therapist on engagement, however, these findings may not be generalizable to face-to-face MBIs. Future research could explore the factors affecting engagement in MBIs in face-to-face MBIs. The most significant limitation of Paper 1 was the use of study dropout (failure to provide post-intervention data) as a proxy of therapy dropout. Although, it was imperative to use study dropouts due to the insufficient information available in the papers reviewed, however, it is challenging to ascertain if study dropout is associated with therapy dropout.

Additionally, a fifth potential facet of engagement 'therapeutic relationship' was excluded from our measure of psychological engagement as this the study included no therapist contact. However, emerging evidence suggests that it is possible to develop a meaningful relationship with self-help interventions (Cavanagh & Millings, 2013) through, for example, the relationship built between the reader and the author (e.g. how

we imagine the author to be, feeling understood by them, feeling that the material resonates with personal goals etc.). Future research could identify methods of quantifying therapeutic relationship in the context of MBSH and investigate its effects on improvements in trait mindfulness. The role of the therapeutic relationship in engagement with traditional group based MBIs could also be explored. A study with 93 adults in outpatient treatment for substance abuse revealed that stronger therapeutic alliance (defined as, a) agreement between client and therapist on goals, (b) agreement on tasks used to achieve those goals, and (c) the interpersonal bond between the client and therapist) led to higher mindfulness scores at 2-month follow up but did not reveal such effects at 4-month follow up (Bowen & Kurz, 2011). Hence, future research could include the role of therapeutic relationship on pre-post changes in trait mindfulness.

While the research in this thesis has several unavoidable limitations, this area of research paves way for several future quantitative and qualitative studies in the area of engagement in MBIS.

7.7 Strengths of the Thesis

There are several theoretical and methodological strengths of this thesis.

Novel approach to engagement in MBIs – The first strength of this thesis is mapping the concept of engagement in MBIs with the construct of engagement in psychotherapy in general. To the best of our knowledge, this is the first research in mindfulness to have undertaken this theoretical approach. Results from this thesis has revealed the existence of a construct of engagement that is beyond mindfulness meditation practice and has highlighted its importance in becoming more mindful. This finding has research as well as clinical implications. Future research can explore how the impact of physical and psychological engagement varies in different populations and how these influences

positive health outcomes. Moreover, this thesis lays a strong groundwork for the importance of developing varied intensities of MBIs for different population groups. MBIs were originally developed for the clinical population (see Kabat-Zinn, 1990; Segal et al., 2002). However, the intensity of the intervention was not altered for delivery of MBIs to the non-clinical or subclinical populations. Hence this research highlights a major gap or stagnation in the research in MBIs.

In addition to developing an understanding of the construct of engagement in MBIs, this thesis is novel because it is one of the first rigorous programme of research that emphasizes the importance of examining engagement in MBIs. Any intervention is only effective if the participants engage with the intervention. Moreover, as highlighted by this thesis, it is clear that participants who disengage from MBIs do so due to conflicting maladaptive thinking styles. This finding can pave foundation for research into incorporating psychoeducation in MBIs (see section 7.7).

Methodological Strengths – This thesis has several methodological strengths. For example, using a mixed methods approach. This is important because information from any one data source (quantitative or qualitative) may be insufficient to explain higher order psychological processes (Creswell & Clark, 2007). Results obtained from a mixed methods approach provides a deeper understanding of the pattern of results and hence are more reliable and generalizable.

Throughout the journey of this thesis effort was made to match the research methods to the research questions. This thesis began with systematically reviewing the information available in the mindfulness literature through a meta-analytic approach. This study revealed the lack of knowledge base of engagement in MBIs, hence employed an inductive approach to build a theoretical framework that future qualitative

studies of the thesis would be based on. Finally, this thesis employed confirmatory statistical techniques to reveal definite answers to the questions set out in the beginning of the journey.

Sample – Another strength of this thesis is to employ varied sources of information to answer the research questions. Relying on a specific sample group could restrict the findings to a specific age group, ethnic background and intervention techniques (e.g. self-help). First, by testing student and NHS staff, the age range of participants in the studies was 18 to 60 years. Second, although the NHS staff were all from a White British ethnic background, the student samples provided a greater mix of ethnicities. Third, data was obtained from both book-delivered and online-delivered interventions. Finally, the mental health conditions of students and NHS staff could be different due to the differential work demands.

7.8 Clinical Implications of the Findings

This thesis has several clinical implications, some of these could be incorporated as psychoeducation in MBIs. Table 7.1 presents a sample engagement topic to accompany a standard 8-week MBI intervention that summarises the clinical implications of this thesis. The psychoeducation module (in Table 7.1) begins with developing positive attitude towards engagement, tackles engagement barriers throughout the intervention and ends with education of engagement types that can enable participants to remain engaged with mindfulness beyond the intervention. The facilitators of engagement (such as, positive attitude towards mindfulness, increased sense of agency over thoughts and enhanced self-compassion) that have been highlighted in this thesis could be incorporated in the psychoeducation providing research evidence and sample quotes from previous participants or research papers.

Additionally, the impact of rumination and worry in engaging with MBIs has been highlighted throughout this thesis and could be included in the engagement topics. Clinicians could directly address the paradox of perseverative thinking styles and engagement in MBIs. Finally, the teacher could highlight the finding that there can be more than one ways of engaging with mindfulness and both psychological and physical techniques can be important in becoming more mindful. This is especially important, as the intensity of the intervention or time commitments (chapter 4; Wyatt et al., 2014) is one of the common hurdles of engagement in MBIs. These techniques help participants who would otherwise disengage from MBIs to remain engaged and hence increase the scope of these highly effective interventions.

Table 7.1: Sample engagement topics that can be incorporated in the weekly MBI sessions

Session	Key Topics	Engagement Topics
Orientation Week	Introduction to mindfulness	<p>The common difficulty of <i>emerging negative thoughts</i> and the idea that <i>becoming more mindful</i> is through being aware of these and <i>decentering</i> from its contents.</p> <p>Using analogies of physical health problems where discomfort and difficulties arise before being cured.</p>

Week 1	<p>The mental states of “autopilot” and “mindfulness”</p> <p>First-hand experience of mindfulness: the raisin exercise</p> <p>Mindfulness practice: body scan</p>	<p>Building positive <i>attitude towards engagement</i>: Research evidence and sample quotes from previous participants.</p>
Week 2	<p>Relationship between thoughts and emotions</p> <p>Awareness of pleasant events</p> <p>Mindfulness practice: sitting meditation</p>	<p><i>Rationale of mindfulness</i> – Why ‘be’ rather than ‘do’</p>
Week 3	<p>Mindfulness practice: 3-minute breathing space</p> <p>Mindfulness practice: mindful stretching and walking</p> <p>Awareness of unpleasant events</p>	<p>Reducing <i>self-critical</i> thoughts of ‘why can’t I get it’.</p> <p>Emphasising the importance of mindful choice – to continue with practice or choosing to take a break. Using analogies such as practising mindfulness is like ‘<i>learning to swim</i>’</p>

Week 4	Automatic thoughts (autopilot) can lead to emotional distress Practice of meditation techniques learned previously	What are <i>perseverative thinking styles</i> and how these habits are resistant to change
Week 5	Sitting meditation focusing on a difficult or stressful situation	Awareness the harm of ruminating and worrying and the paradox of <i>perseverative thinking</i> styles and engagement in MBIs
Week 6	Thoughts are not facts Using the 3-minute breathing space in stressful situations	Mindfulness can bring about a greater <i>sense of agency</i> over thoughts – examples and quotes
Week 7	Relationships between daily activities and depression Generate list of pleasure/mastery activities Identifying relapse triggers	The importance of <i>self-compassion</i> and how mindfulness enhances self-compassion – research and quotes
Week 8	Course review Keeping a long-term meditation practice going	Two forms of engagement in MBIs and the role of each form in building mindfulness skills after the course is completed

Note: The psychoeducation topics that are marked in *italics* are themes of facilitators and barriers of engagement noted in Chapter 4.

7.9 Priorities for Future Research

This thesis has highlighted several gaps in the literature that could be addressed by future research (discussed in previous sections).

- a) This thesis has revealed inconclusive results on the effects of physical engagement in MBIs in the non-clinical population. Given that there is inconsistency in the literature about the importance of formal mindfulness practice in achieving clinical outcomes (see Carmody and Baer, 2008; Hindman et al., 2015), it is crucial for future research to explore this in further detail. An RCT could be developed that compares formal mindfulness meditation with informal mindfulness meditation and a control group. This could demonstrate the differential effects of these varied forms of engagement in mindfulness practice on the increase in trait mindfulness.
- b) This thesis highlighted that physical and psychological engagement are only loosely related constructs. This is contradictory to previous ideas of the importance of physically engaging in mindfulness to be psychologically engaged (Kabat-Zinn, 1982). This could be explored more rigorously in future studies on the clinical as well as the non-clinical population. An RCT comparing formal mindfulness meditation condition to a mindfulness psycho-education condition could be used in order to investigate this.
- c) This thesis developed a new measurement scale for measuring psychological engagement in MBIs. Although the reliability of this scale was high in studies that it was used in, however, future studies could employ this scale further to establish the validity of this scale. Moreover, a psychological engagement questionnaire could be developed using the recommendations highlighted in section 2.3.4.

- d) In addition to highlighting the barriers to engagement, this thesis presents some preliminary ideas of overcoming these barriers in the form of psychoeducation. Future research could compare the health outcomes of a standard MBI condition with an MBI plus engagement topics condition, in order to ascertain the significance of the empirical findings of this thesis. This could be achieved by conducting an RCT study comparing a standard MBI condition with an MBI plus engagement condition.
- e) Although this thesis highlighted the effect of physical and psychological engagement in MBSH on increase in trait mindfulness, the length of mindfulness practice required to develop significant therapeutic effects was not investigated in this thesis. A recent RCT compared recurrence of major depression immediately, after treatment, and at 3, 6, 9, and 12-months post-treatment based on self-reported ratings of home practice over 7 treatment weeks (Crane et al., 2014). Results indicated a significant association between mean daily duration of formal home practice and outcome and additionally indicated that participants who reported that they engaged in formal home practice on at least 3 days a week during the treatment phase were almost half as likely to relapse as those who reported fewer days of formal practice. Interestingly, even in the clinical population 3 days of practice rather than daily mindfulness practice was sufficient in reducing risk of relapse. Hence, even lower amount of practice may be required in the non-clinical population to bring positive outcomes. An RCT (similar to Crane et al., 2014) could be used to test the effect of varied levels of mindfulness practice and its therapeutic effects in the clinical as well as the non-clinical population.

7.10 Conclusions

This thesis addresses an important gap in the literature exploring the meaning of engagement in MBIs and the factors associated with it. Although the findings in this thesis do provide some preliminary evidence that engagement in MBIs include physical and psychological aspects and rumination and worry are associated with disengagement, there is a need for further research to generalise these results in the clinical population and draw strong conclusions. However, this initial exploration of these research questions may act as a useful guide for further research in this area.

Drawing on the preliminary findings for this area of research, both rumination and worry seems to play a role in engagement in MBIs. Additionally, both physical and psychological engagement in MBIs resulted in increased trait mindfulness. Additionally, several other factors of engagement were identified in the qualitative study such as, length and intensity of the intervention and perceived consequences. These could be explored in future empirical studies. Moreover, this thesis included the first study that identified facilitators of engagement. The findings of this thesis can have several theoretical and clinical implications and may aid enhancing engagement in mindfulness interventions and thereby play a positive role in disseminating the beneficial outcome of mindfulness on the participants of these interventions. It is, thus, vital for this area to be explored further in future research.

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(Papers marked with * have been included in the meta-analysis)

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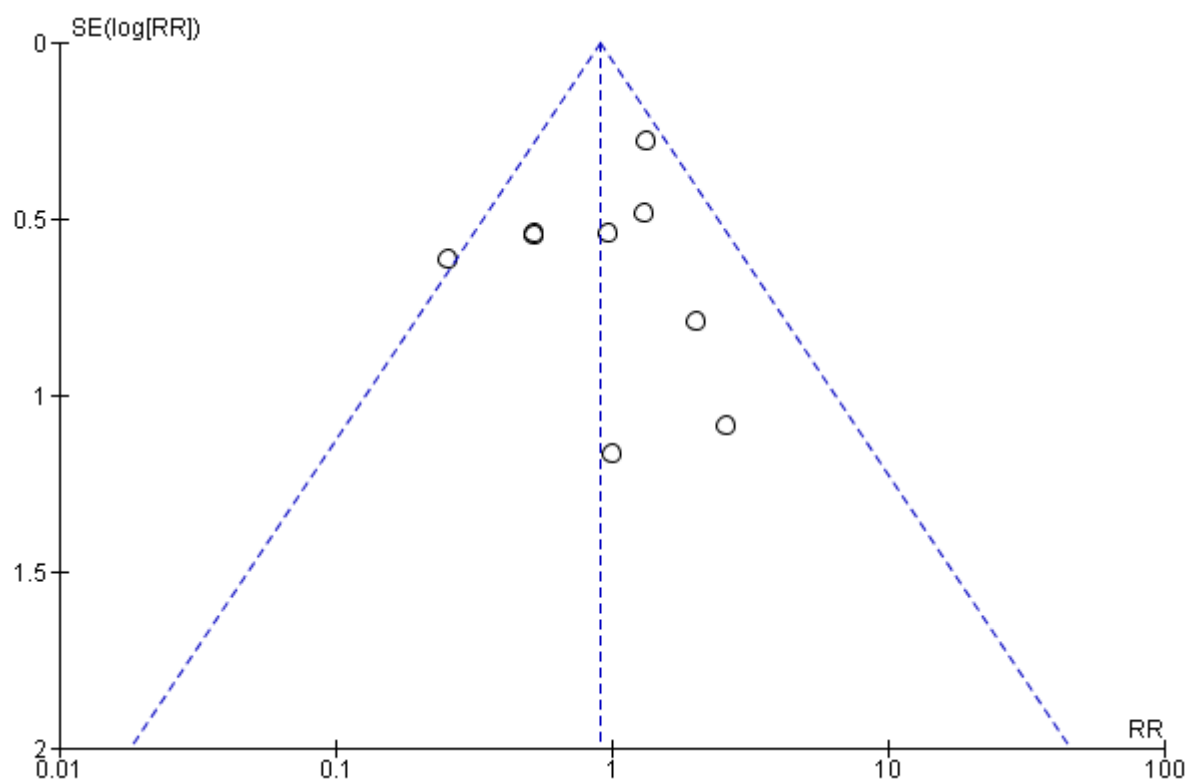
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Appendices

Appendix 1: Paper 1: Funnel Plot



Appendix 2: Paper 2: Intervention Description

MBSH book

The MBSH book self-help intervention will be unguided self-help using the book “Mindfulness: A practical guide to finding peace in a frantic world” (Williams and Penman, 2011). Mark Williams, the first author of the book, was a prominent figure in the development and evaluation of group Mindfulness-Based Cognitive Therapy (MBCT). Our recent RCT of Williams and Penman’s (2011) book found a significant reduction in stress, anxiety and depression for those who received the intervention compared to wait-list control in a student population, with large effect sizes (Lever-Taylor et al., under review). The majority (85%) of the participants reported reading at least half of the book, and the medium number of mindfulness meditations practiced was 2-3 per week. The book is based on the group MBCT course, and teaches mindfulness principles and practices through the text and an accompanying CD. The structure of the book is faithful to the eight-week face-to-face MBCT course, and comprises an introduction to the course followed by eight chapters. Each chapter is based on the equivalent weekly session in the group MBCT course. Readers are advised to follow one chapter and per week. The book costs approximately £6 and is freely available to purchase from all major booksellers. Participants will be able to keep the book after the study has ended.

MBSH online program

The MBSH online intervention will be an unguided self-help using the program “BeMindful” (www.bemindfulonline.com/). This structured online course incorporates the key elements of both MBCT and mindfulness-based stress reduction (MBSR). It costs £60 and comprises an introductory video and course end video in addition to 8

interactive 30-minute online sessions. As part of the course, participants complete questionnaires (the Perceived Stress scale, the 9-item Patient Health Questionnaire, and the 7-item General Anxiety Disorder 7) at three time points: before starting the course, after finishing the course, and four weeks after finishing the course. The class sequence is faithful to the structure of face-to-face MBCT courses. The sessions can be completed while sitting at any computer with an internet connection. Participants are guided through formal meditations (body scan, mindful 12 movement, sitting meditation, and three minute breathing space) by instructional videos. Participants also learn everyday mindfulness activities. Sessions are led by two mindfulness instructors (one male, one female). The program guidelines state that the course can be completed in four weeks, although there is no time limit and completion time depends on when participants complete the practice and homework logs. Participants are asked to complete at least one audio-guided formal mindfulness exercise each week and one informal exercise. Participants are also sent 8 emails corresponding to the 8 course sessions, encouraging them to engage with the materials and offering additional information about mindfulness and mindfulness exercises. At the end of the course, participants receive a printed guide to everyday mindfulness.

Appendix 3: Paper2: Participant Information Sheet

A teaching trust of Brighton
and Sussex Medical School

Sussex Partnership 
NHS Foundation Trust

Feasibility study of mindfulness-based self-help for NHS staff

PARTICIPANT INFORMATION SHEET

Invitation

Would you like to take part in this research study? Before you decide, it is important for you to understand why the research is being done and what it would involve. Please take time to read the following information and to decide whether or not you wish to take part. Ask us if there is anything that is not clear or if you would like more information (please see our contact details at the end of this document). Please take time to decide whether or not you wish to take part.

Brief summary

We are investigating two kinds of self-help course with 30 Sussex Partnership NHS Foundation Trust staff members. These staff members will be asked to choose between a mindfulness-based cognitive therapy (MBCT) self-help course that uses a book as a guide and a MBCT self-help course that uses an online program as a guide.

Participants will have 8 weeks to complete the course, and are advised to spend 1-2 hours per week engaging with course materials and exercises. All participants will receive emails encouraging them to keep following the guides during the course.

There is more information about the study on the next few pages. If you have any questions you can call or email Puffin O'Hanlon, the research assistant on the study (see contact details on the last page).

What is the purpose of the study?

What is Mindfulness-Based Cognitive Therapy?

Mindfulness is the capacity to notice and accept our current experience (thoughts, feelings, body sensations) and respond to our experiences in a way that is helpful. Mindfulness-based cognitive therapy (MBCT) adds mindfulness meditation practice and principles to cognitive therapy. A substantial body of evidence supports the effectiveness of group MBCT in reducing symptoms of psychological distress and improving wellbeing. Evidence also suggests that participation in

group mindfulness-based interventions is associated with a number of beneficial outcomes among healthcare workers. Staff participation in these therapies may also improve outcomes for patient.

What is this study about?

Emerging evidence suggests that the use of mindfulness-based self-help materials might be helpful for improving wellbeing and for people experiencing mild or moderate symptoms of stress, anxiety, and/or depression. However, to date, there is no high quality research evaluating the benefits of self-help MBCT for healthcare staff.

This study aims to investigate whether self-help mindfulness-based interventions are acceptable and engaging for NHS staff. We are also interested in staff experiences of participating in research into mindfulness-based self-help interventions.

The outcomes of this study will be used to inform the design of a pilot trial of a self-help MBCT intervention for NHS staff, the aim of which will be to evaluate the effectiveness of the intervention in improving staff wellbeing. If the pilot study is successful, the research team hopes to conduct a full trial of the intervention. If the results of the trial show that mindfulness-based self-help is beneficial for NHS staff, the research team will support the provision of the intervention for NHS employees.

Am I eligible to take part in this study?

The only requirements for participation are that you:

1. are currently employed by the Sussex Partnership NHS Foundation Trust and are currently in work
2. have not previously completed 50% or more of a mindfulness-based intervention
3. have sufficient English Language reading ability to undertake a course that is taught through materials written and spoken in English.

Aside from these criteria the study is open to all Sussex Partnership employees. You do not need to be experiencing distress or mental health difficulties to take part in this study.

Do I have to take part?

It is up to you to decide whether or not to take part. If you decide not to take part this will not affect terms and conditions of your employment.

If you decide to take part you will be asked to sign a consent form. You will be free to withhold any personal information or to withdraw at any time, without giving a reason and without this affecting the terms and conditions of your employment.

If you do decide to take part we will ask you not to use any other psychological interventions during the course of the study. This will help us to explore staff experiences of mindfulness-based self-help.

Do I need to inform my manager if I decide to take part?

If you decide to take part, you will be asked to provide the name and contact details of your manager. The research team will then send them a copy of this information sheet, along with an information sheet for managers. The manager's information sheet makes it clear that this study is

open to all members of staff currently in work, and clarifies that potential participants do not need to be experiencing distress or mental health difficulties to take part.

If you choose to undertake the mindfulness intervention in your own time, you do not need permission from your manager to participate in the study. However, should you wish to undertake the mindfulness-based self-help course during your working hours, you will need to agree this with your manager.

What would taking part involve?

If you decide that you want to take part in this study, you will need to complete and sign the consent form, and return it to the research team (see contact details on the last page). You will also need let the research team know whether you would like to receive a mindfulness-based self-help book or access to a mindfulness-based online program.

When we have received your consent form, we will email you with a link to some online questionnaires. If you have chosen the book, you will receive this email seven days after we receive your consent form, to allow time for your book to arrive. You will be asked not to start the course until you have completed the online questionnaires.

The online tick-box questionnaires will ask you:

1. About your recent experiences of stress, anxiety, and/or low mood
2. About your quality of life
3. How mindful you are in everyday life
4. About your self-compassion
5. About the way that you think about negative experiences and problems.
6. About the way in which you respond to other people and situations.

You will also be asked some questions about your age, gender, ethnicity, and job title.

These questionnaires should take around 20 minutes to complete.

What will happen when I have completed the questionnaires?

When you have completed the pre-course questionnaires, you will be sent an email asking you to start your chosen mindfulness-based self-help course.

All participants will have 8 weeks to complete their chosen course. You will be sent an email at the end of each week during the intervention providing some additional information about mindfulness and encouraging you to complete the exercises and practices recommended by the guide for that week.

The weekly emails will also ask you to answer six tick-box questions regarding your engagement with the course during the previous week. These should take no more than two minutes to complete each week. It is important for the purposes of this study that you answer these questions as accurately as possible, as the information you provide will be useful in evaluating whether the course is feasible for NHS staff.

What happens when I have completed the course?

Eight weeks after starting the course, you will be asked to complete the same set of questionnaires that you completed before starting the course. You will also be asked some brief questions about your engagement with and experience of the intervention.

When you have completed the intervention, you will be asked to take part in an audio-recorded telephone interview with the study Research Assistant. This should last no longer than 30 minutes. You will be asked about your experiences of the self-help course and of taking part in the study. Any information you are able to provide about your experiences of the course are extremely valuable for the purposes of our research.

The total time involved in the study will be about 8-16 hours, depending the amount of time you choose to spend engaging with the intervention.

How do I choose between the two mindfulness-based self-help interventions?

Both the MBCT book and the MBCT online program are self-help guides. Both are based on the group MBCT course. You will have 8 weeks to complete the interventions, and the courses will take about 1-2 hours of your time each week, including time for reading the self-help book or undertaking online sessions, completing exercises, and answering the brief weekly questions.

The MBCT book teaches mindfulness principles and practices through the text and an accompanying CD. The structure of the book is faithful to the eight-week face-to-face MBCT course, and comprises an introduction to the course followed by eight chapters. Each chapter is based on the equivalent weekly session in the group MBCT course. Readers are advised to follow one chapter and per week.

The online MBCT course teaches mindfulness principles and practices through 10 interactive 30-minute online sessions, in addition to which people encouraged to practice mindfulness in everyday life. The class sequence is faithful to the structure of face-to-face MBCT courses. The sessions can be completed while sitting at any computer with an internet connection. Participants are guided through mindfulness practices by instructional videos. Pre-recorded sessions are led by two mindfulness instructors (one male, one female). Participants are advised to take eight weeks to complete the course. As part of the online course, you will be asked to complete two short questionnaire asking you about your experiences of stress, anxiety, and depression, one before you start the course, the other when you have completed the course. These should take no longer than five minutes to complete. These questionnaires are integral to the course design. You will be able to see your responses to these questionnaires and any changes that occur between starting and finishing the intervention. You will also be asked, before starting each session, some brief questions about how frequently you practiced the mindfulness exercises between sessions. These questions are also integral to the course. they should take no longer than one minute to complete.

Where will I have to go?

The courses are designed to be completed at times and locations that are convenient for you. The online program can be completed while sitting at an internet connected computer. Audio guidance for the mindfulness meditation practices can be downloaded for use in-between sessions. The book comes with a CD of guided mindfulness practices which can be undertaken anywhere that feels right for you.

What are the advantages and disadvantages of taking part?

Mindfulness-based interventions have been shown to increase self-acceptance, self-compassion, and foster a non-judgmental attitude. Mindfulness training may also increase attention to the

present moment, reducing focus on past worries and future concerns and helping people to let go of unpleasant experiences. It may also decrease symptoms of stress, anxiety and depression.

The mindfulness-based self-help courses are types of self-help that are not routinely provided in the NHS because they have not been researched in a high quality study. For this reason we do not know whether or not they will be helpful. By taking part in the study you will be helping us to find out if mindfulness-based self-help courses are helpful in improving NHS staff wellbeing and this will help NHS trusts when they are planning what support to offer staff.

Reflecting on our thoughts, feelings and experiences with can be helpful, although it can also sometimes feel difficult. During mindfulness practice we may become aware of some unpleasant thoughts, feelings and/or experiences: this is completely normal. The self-help guides provide advice on ways of coping when such feelings arise. However, if you are feeling distressed and that you need additional advice or support, contact details of organisations that you may find useful are provided on the last page of this information sheet. You may also wish to contact your GP for further guidance.

Please note that the interventions used in this study are unguided self-help, and the research team are not able to offer individual support.

This study has received approval from the Sussex Partnership NHS Foundation Trust Research and Development Department, which has indicated that there are no substantial risks relating to participation and also no major disadvantages associated with taking part.

Confidentiality

We will inform your manager that you are taking part in this study. All information collected will be kept strictly confidential and stored securely. Anonymity will be ensured in the publication of findings. Telephone interview audio recordings will be transcribed and anonymised and audio recordings destroyed after the study. Direct quotations taken from telephone interviews may be included in papers written for publication, but these quotations would not identify you. Only members of the research team and regulatory authorities will have access to information gathered through the study. This information will be coded and your name and contact details will be removed so that you cannot be recognised from it. The study complies with data protection laws.

In the event that members of the research team become significantly concerned about your wellbeing to the extent that they are concerned about your safety or about the safety of others they will talk with you about their concerns. If their concerns remain they will be obliged to inform your manager and you would be withdrawn from the study. If your manager becomes significantly concerned about your wellbeing during the study they will be asked to inform the research team. In this event we will talk to you and discuss your continued participation in the study.

What will happen to the results of the study?

The results of this study will be used to inform the design of a larger study that will evaluate the effectiveness and acceptability of a self-help mindfulness-based intervention for NHS staff. You can choose to receive feedback on the results of this study. No-one will be identified in any publication.

Who has reviewed the study?

The study has been reviewed and approved by the Research and Development Department within your NHS Trust.

Next Steps

If you are interested in taking part in the study please allow yourself at least 24 hours to consider your decision before completing the consent form. This is to ensure that you have had time to consider your decision.

If you would like any further information about this study please call Puffin O'Hanlon on 01273 696011 or email at puffin.o'hanlon@sussexpartnership.nhs.uk.

If you would like to take part in the study, please complete and sign the consent form and return it to the research team by emailing it as an attachment to staffmindfulness@sussexpartnership.nhs.uk or posting it to the research team using the enclosed stamped addressed envelope.

Please also contact the research team on 01273 696011 or at staffmindfulness@sussexpartnership.nhs.uk.

If no-one is available to answer your call, please leave a message and someone will call you back.

The research assistant for the study is:

Puffin O'Hanlon
Research & Development
Sussex Education Centre
Mill View Hospital Site
Nevill Avenue
Hove
BN3 7HZ
01273265898
Puffin.O'Hanlon@sussexpartnership.nhs.uk

The research lead for the study is:

Dr Clara Strauss
Clinical Research Fellow
Research & Development
Sussex Education Centre
Mill View Hospital Site
Nevill Avenue
Hove
BN3 7HZ
01273 265909
clara.strauss@nhs.net

Should you have concerns in relation to your psychological wellbeing during this study you may wish to let us know. If you do have concerns about your psychological wellbeing we could encourage you to contact your GP for advice and/or support. You may also wish to discuss your concerns with your manager. In addition, you can self-refer or your manager can refer you to

Sussex Partnership NHS Foundation Trust Occupational Health Services (provided by West Sussex Health):

Occupational Health Department
Southlands Hospital,
Upper Shoreham Road,
Shoreham-by-Sea,
BN43 6TQ
01273 446056
occupationalhealth.admin@westsussexpct.nhs.uk

Alternatively, Mind (08457 90 90 90; <http://www.mind.org.uk/>) provides information, advice, and support for people experiencing psychological distress.

If you are harmed by taking part in this research study, there are no special compensation arrangements. If you are harmed by someone's negligence, then you may have grounds for a legal action, but you may have to pay for it. Regardless of this, if you wish to complain, or have any concerns about any aspect of the way you have been approached or treated during the course of this study, the normal National Health Service complaints mechanisms should be available to you. You may also wish to seek advice from the Sussex Partnership Service Experience Team (email service.experience@sussexpartnership.nhs.uk or phone 01903-843026).

If you decide to participate in the study you will be given a copy of this information sheet and a signed consent form to keep.

Appendix 4: Paper 2: Consent form

A teaching trust of Brighton
and Sussex Medical School

Sussex Partnership 
NHS Foundation Trust

Centre number:

Participant Identification Number:

CONSENT FORM

Title: Feasibility study of mindfulness-based self-help for NHS staff

Name of Researcher leading the study: Dr Clara Strauss

**Please
initial
box**

- 1 I confirm that I have read and understand the Participant Information Sheet dated 28 November 2013 (version 4) for the above study and have had the opportunity to ask questions.
- 2 I confirm that I have had sufficient time to consider whether or not I want to be included in this study.
- 3 I understand that my participation is voluntary and that I am free to withhold personal information or to withdraw at any time, without giving any reason, and without my legal rights being affected.
- 4 I understand that if I choose to withdraw that any questionnaires I have already completed will be kept by the research team.
- 5 I understand that data collected during the study may be looked at by individuals from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.
- 6 I give permission for findings from the study to be written up for publication. Any publication would not identify me

☐☐☐☐☐☐☐

7 I give permission for non-identifiable data to be shared with other research teams for research purposes.

8 I understand that, as part of this study, I may be asked to take part in a telephone interview. I give permission for this interview to be audio recorded. I understand these audio recordings will be transcribed and anonymised and audio recordings destroyed after the study. I give permission for direct quotations taken from this interview to be included in papers written for publication. Any quotation would not identify me.

☐

9 I understand that my manager will be informed that I am taking part in this study.

☐

10 I will only undertake the self-help the intervention during work hours with the approval of my manager

☐

11 I agree to take part in the above study

☐

Name of participant's manager

Manager's email

Name of participant

Date

Signature

Researcher

Date

Signature

Please tick this box if you would like to receive a copy of findings from the study ☐
If you would like a copy of findings please indicate if you would like these by post ☐ or by email ☐

Appendix 5: Paper 2: Change Interview Protocol

Preparation: Label your notes and the interview tape with the following information: Participant initials and case number; date of interview; your name; whether this is a mid-treatment or post-treatment interview (including how many previous sessions the participant has had)

Interview Strategy: This interview works best as a relatively unstructured empathic exploration of the participant's experience of course. Think of yourself as primarily trying to help the participant tell you the story of his or her course so far. It is best if you adopt an attitude of curiosity about the topics raised in the interview, using the suggested open-ended questions plus empathic understanding responses to help the participant elaborate on his/her experiences. Thus, for each question, start out in a relatively unstructured manner and only impose structure as needed. For each question, a number of alternative wordings have been suggested, but keep in mind that these may not be needed.

- Ask participant to provide as many details as possible
- Use the "anything else" probe (e.g., "Are there any other changes that you have noticed?"): inquire in a non-demanding way until the participant runs out of things to say.

Introduction given to participants: The major topics of this interview are:

- Any changes you have noticed since course began,
- What you believe may have brought about these changes,
- Helpful and unhelpful aspects of the course.

The main purpose of this interview is to allow you to tell us about the course and the research in your own words. This information will help us to understand better how the course works; it will also help us to improve the course.

Consents:

- Audio recorded, transcribed and anonymised.
- Identifiable information removed
- Some direct quotations may be used in paper – no quotation can identify you
- Right to not answer or withdraw from interview at any time

Please provide as much detail as possible.

Participant

Name _____.

Interviewer _____ Date _____

—

Interview Schedule:

1. *General Questions*: [about 5 min]

1a. How are you doing now in general?

1b. How has it felt to be in course?

2. *Changes*: [about 10 min]

2a. What changes, if any, have you noticed in yourself since course started?

(Interviewer:

- *Reflect back change to participant.*
- *Write down brief versions of the changes for later.*
- *If it is helpful, you can use some of these follow-up questions: For example,*
- *Are you doing, feeling, or thinking differently from the way you did before?*
- *What changes, if any, have been brought about by learning about mindfulness?*
- *Could you reflect on the changes, if any, in the way you deal with stress?*
- *What specific ideas, if any, have you gotten from the course so far, including ideas about yourself or other people?*
- *Have any changes been brought to your attention by other people?*
- *Prompt for changes at work and outside, depending on what is mentioned.*

2b. Has anything changed for the worse for you since course started?

2c. Is there anything that you wanted to change that hasn't since course started?

3. *Change Ratings*: [about 10 min] (Go through each change and rate it on the following three scales:)

3a. For each change, please rate how much you expected it vs. were surprised by it? (Use this rating scale:)

- (1) Very much expected it
- (2) Somewhat expected it
- (3) Neither expected nor surprised by the change
- (4) Somewhat surprised by it
- (5) Very much surprised by it

3b. For each change, please rate how likely you think it would have been if you hadn't been in course? (Use this rating scale:)

- (1) Very unlikely without course (clearly would not have happened)
- (2) Somewhat unlikely without course (probably would not have happened)
- (3) Neither likely nor unlikely (no way of telling)
- (4) Somewhat likely without course (probably would have happened)
- (5) Very likely without course (clearly would have happened anyway)

3c. How important or significant to you personally do you consider this change to be? (Use this rating scale:)

- (1) Not at all important
- (2) Slightly important

- (3) Moderately important
- (4) Very important
- (5) Extremely important

4. *Helpful Aspects*: [about 10 min] Can you sum up what has been helpful about your course so far? Please give examples. (For example, general aspects, specific events)

Was there any other specific aspects you found helpful, such as the formal practice or applying the ideas more informally in daily life?

Was there any aspects of the structure of the session that you found helpful?

5. *Attributions*: [about 5 min] In general, what do you think has caused the various changes you described? In other words, what do you think might have brought them about? (Including things both outside of course and in course)

6. *Resources*: [about 5 min]

6a. What personal strengths do you think have helped you make use of the course to deal with your problems? (what you're good at, personal qualities)

6b. What things in your current life situation have helped you make use of the course to deal with your problems? (family, job, relationships, living arrangements)

7. *Problematic Aspects*: [about 5 min]

7a. What kinds of things about the course have been hindering, unhelpful, negative or disappointing for you? (For example, general aspects, specific events)

Was there any aspects of the structure of the session that you found problematic?

7b. Were there things in the course which were difficult or painful but still OK or perhaps helpful? What were they?

7c. Has anything been missing from your treatment? (What would make/have made your course more effective or helpful?)

8. *Limitations*: [about 5 min]

8a. What personal weaknesses do you think have made it harder for you to use course to deal with your problems? (things about you as a person)

8b. What things in your life situation have made it harder for you to use course to deal with your problems? (family, job, relationships, living arrangements)

9. *Suggestions*. [about 5 min] Do you have any suggestions for us, regarding the research or the course? Do you have anything else that you want to tell me?

Appendix 6: Papers 3 and 4: Learning Mindfulness Online Program

The screenshot shows a web browser window with the URL <https://studysdirect.sussex.ac.uk/course/view.php?id=20384&rel=home>. The page title is "Learning Mindfulness Online" and it indicates "All year teaching 13-14". On the left, there is a search bar labeled "Search site" with a "Resource/Activity name" input field. Below the search bar is a list of links: "Welcome", "What is Mindfulness?", "Daily Mindfulness Practice", "Everyday Mindfulness Activities", "Daily Practice and Everyday Mindfulness Activities FAQ", "My Daily Journal", "Study Information", and "Help and Assistance". A "Print-friendly view" button is located at the bottom of the left sidebar. The main content area has a "Welcome" heading followed by a paragraph: "Thank you for agreeing to take part in this study and for completing the initial questionnaires. You have now been given access to this Study Direct site where you will be able to learn about mindfulness, how to use a daily 10 minute mindfulness meditation practice and how to bring mindfulness to your everyday activities." Below this is a bolded recommendation: "We recommend you read the 'What is Mindfulness?' page before engaging in your first daily mindfulness meditation and mindful activity." Further down, it says: "You may also wish to take a moment to explore the site using the menu on the left hand side of the page and see what is available on the following pages." Then, a "Welcome:" paragraph states: "This is the welcome page. If you ever need to get back to this page, please click on the 'Welcome' link in the menu." Next is a "What is Mindfulness?:" paragraph: "Here you will be able to get information explaining the purpose and benefits of learning mindfulness, and how it works. The page also contains useful links to other mindfulness resources if you want to learn more." Finally, a "Daily Mindfulness Practice:" paragraph says: "This page will allow you to access the 10 minute mindfulness practice whenever you wish to use it. To maximize any benefit from the practice, we recommend you try it on a". The Windows taskbar at the bottom shows the date as 14:24 on 19/11/2013.

The screenshot shows the "Daily Mindfulness Practice" page. It features two YouTube video players. The first video is titled "Daily mindfulness practice (female voice): play the youtube video below (audio only):" and the second is titled "Daily mindfulness practice (male voice): play the youtube video below (audio only):". Both videos show a person meditating in a serene landscape with mountains and water. Below the videos, there is a note: "If you have any questions about any thoughts or experiences arising during the practice, please check out the Daily Practice FAQ page." The Windows taskbar at the bottom shows the date as 14:26 on 19/11/2013.

Appendix 7: Paper 3: Ethics Approval Certificate



University of Sussex

**Sciences and Technology
Cross-Schools Research Ethics Committee**

CERTIFICATE OF APPROVAL

Reference Number:	ER/MB363/1 [KCMB1113]
Title of Project:	Factors associated with engagement in mindfulness-based self-help interventions
Principal Investigator:	Kate Cavanagh
Student:	Moitree Banerjee
Collaborators:	-
Duration of Approval:	11 months
Expected Start Date:*	1 Dec 2013
Expiration of Approval:	1 Dec 2014
<p>The proposed amendments to this project – i.e., clarification to the information sheet - has been given ethical approval by the Sciences and Technology Cross-Schools Research Ethics Committee (C-REC).</p>	
<p>*NB. If the <u>actual</u> project start date is delayed beyond 12 months of the <u>expected</u> start date, this Certificate of Approval will lapse and the project will need to be reviewed again to take account of changed circumstances such as legislation, sponsor requirements and University procedures.</p> <p>Please note and follow the requirements for approved submissions:</p> <p>Amendments to protocol.</p> <ul style="list-style-type: none"> Any changes or amendments to approved protocols must be submitted to the C-REC for authorisation prior to implementation. <p>Feedback regarding the status and conduct of approved projects</p> <ul style="list-style-type: none"> Any incidents with ethical implications that occur during the implementation of the project must be reported immediately to the Chair of the C-REC. <p>The principal investigator is required to provide a brief annual written statement to the committee, indicating the status and conduct of the approved project. These reports will be reviewed at the annual meeting of the committee. A statement by the Principal Investigator to the C-REC indicating the status and conduct of the approved project will be required on the following date(s):</p> <p>December 2014.</p>	
Authorised Signature	Richard de Visser
Name of Authorised Signatory (C-REC Chair or nominated deputy)	Richard de Visser
Date	10 February 2014

Appendix 8: Paper 3: Ethics Approval Certificate



Certificate of Approval

Reference Number: ER/JG252/6

Title Of Project: How does an online mindfulness-based self-help intervention improve mental health? (COPY)

Principal Investigator (PI): Clara Strauss

Student: Jenny Gu

Collaborators: Moitree Banerjee

Duration Of Approval: 2 months

Expected Start Date: 19-Jan-2015

Date Of Approval: 09-Jul-2015

Approval Expiry Date: 28-Aug-2015

Approved By: Richard de Visser

Name of Authorised Signatory: Richard de Visser

Date: 09-Jul-2015

*NB. If the actual project start date is delayed beyond 12 months of the expected start date, this Certificate of Approval will

lapse and the project will need to be reviewed again to take account of changed circumstances such as legislation, sponsor

requirements and University procedures.

Please note and follow the requirements for approved submissions:

Amendments to protocol

* Any changes or amendments to approved protocols must be submitted to the C-REC for authorisation prior to

implementation.

Feedback regarding the status and conduct of approved projects

* Any incidents with ethical implications that occur during the implementation of the project must be reported immediately

to the Chair of the C-REC.

Feedback regarding any adverse and unexpected events

* Any adverse (undesirable and unintended) and unexpected events that occur

during the implementation of the project must be reported to the Chair of the Social Sciences C-REC. In the event of a

serious adverse event, research must be stopped immediately and the Chair alerted within 24 hours of the occurrence.

For Life Sciences and Psychology projects

* The principal investigator is required to provide a brief annual written statement to the committee, indicating the status

and conduct of the approved project. These reports will be reviewed at the annual meeting of the committee. A

statement by the PI to the C-REC indicating the status and conduct of the approved project will be required on the

Approval Expiration Date as stated above.

Appendix 9: Papers 3 and 4: Engagement Scales

Instructions:

Please indicate how many the following statements apply to your experience of the Learning Mindfulness Online program in the last three days.

1. On how many days [over the past two weeks] did you practice mindfulness meditation at least once?
 2. How many times on an average did you practice mindfulness meditation each day?"
- Not at all Once Twice Three times More than three times

	Not at all 1	2	3	4	Extremely 5
1. How motivated were you to set time aside to use the mindfulness online course					
2. How likely do you think you are to engage in mindfulness?					
3. How effective do you think mindfulness is in helping to deal with stressful situations?					
4. How often did you bring mindfulness principles into your life each day?					