Headspace for parents: Using a mindfulness app to manage parenting stress

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A thesis submitted for the degree of Doctor of Philosophy

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Declaration

I, Abigail Emma Louise Burgess, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Abstract

Parenting stress can influence children's psychological adjustment. Some evidence suggests parenting stress is associated with, and ameliorated by, parental mindfulness. This thesis aimed to determine the magnitude and meaning of associations between parenting stress, parental mindfulness, and children's adjustment outcomes. It is proposed child outcomes may improve following improvements in parental wellbeing by practising mindfulness. To test this, the effectiveness of a self-directed mindfulness app (*Headspace*—the collaborative partner) was evaluated with parents of children aged 2-5.

Three projects addressed these aims. Project 1 scoped research investigating mindfulness and parenting, identifying gaps for digital, self-directed mindfulness interventions for parents of typically developing children. Project 2 aimed to address these gaps using a mixed methods approach to investigate the initial effectiveness of *Headspace*, aiming to understand the app's acceptability and feasibility in parents' daily lives. The qualitative results of Project 2 were preliminarily published in *BJPsych Open*, and are expanded on in Chapter 4. Due to confounding by COVID-19 (see review, Appendix O), the quantitative results of this project were not published but are described here in Chapter 5. Project 3 was intended to determine the feasibility of a more robust study testing *Headspace*, using an internal pilot randomised controlled trial design (see Chapter 6).

Overall, this thesis suggests parents generally found *Headspace* feasible and acceptable, and some improvements were noted for wellbeing in both Projects 2 and 3. Qualitative reports indicated improvements in parental sleep and ability to manage stress, and—with

caution—some quantitative support was found for improvements in sleep post-intervention in Project 3. Limited evidence for improvements in children's adjustment were found, however, this thesis demonstrates the potential of *Headspace* for parent wellbeing. Future research might benefit from investigating relationships between parental mindfulness and sleep, particularly its potential to improve parents' stress perceptions, in more diverse samples.

Impact Statement

This thesis aimed to address a lack of evidence supporting the use of a commercially available mindfulness-based app (*Headspace*) to improve wellbeing for parents and their children. While the literature suggests mindfulness can help parents manage their stress, improving their own and their child's wellbeing, there is little evidence to support self-delivered, app-based, mindfulness interventions in this population. The lack of available evidence investigating parents is likely to impact the accessibility of support, particularly following the COVID-19 pandemic.

The findings from this thesis contribute to research and practice in several ways. In terms of research, these findings identify a potential, under-researched link between parental use of mindfulness skills, improvements in parents sleep, and the benefits that that can have on their perceptions of their children's quality of sleep. The design of previous studies measuring the effects of Mindfulness-Based Interventions (MBIs) for parents do not include sleep as an outcome—a factor which can drastically impact on a parent's quality of life, and which this thesis suggests may be an important facet of their wellbeing that mindfulness can improve. This thesis also demonstrated the feasibility and acceptability of delivering a self-directed mindfulness intervention to parents via a smart-phone app. This is a novel intervention in the parenting literature, and the preliminary findings in this thesis following pilot trial testing of its initial feasibility and acceptability may have important implications for the planning and design of future work. In particular, how researchers can best help parents to engage with the app in a way that works for them, which is also feasible for a randomised controlled trial design.

In terms of practice, this thesis has implications for parents themselves, clinicians, and researchers working with families affected by child adjustment problems and issues with parental wellbeing. This thesis supports the utility of mindfulness-based apps for improving parental wellbeing, and adds to some elements of the evidence base supporting the theory of mindfulness in parenting. By identifying an under-researched aspect of parental wellbeing—sleep—in relation to mindfulness, this thesis may influence clinical practice by identifying an accessible and potentially overlooked avenue of improving parent-perceptions of sleep quality—self-directed MBIs. Of particular relevance to clinicians, this thesis highlights some of the barriers for parents wishing to implement mindfulness in their daily lives, as well as how self-directed interventions may be used pragmatically in research and clinical settings.

This thesis also sheds some novel light on the impact of COVID-19 both on 'low-risk' family experiences during lockdowns, and implications for research processes. In particular, it highlights the difference between the implementation of MBIs pre-pandemic and post-pandemic. This is of relevance because it is crucial to contextualise interventions in development through every phase of testing if they are to induce behaviour change in target populations (Skivington et al., 2021). Furthermore, an accessible, self-directed intervention which can be delivered remotely to parents may be particularly impactful post-COVID-19 where there are continued strains on families in the context of ever more stretched healthcare services and a move to more flexible service delivery (Organisation for Economic Co-operation and Development; OECD, 2021a, 2023).

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List of Abbreviations

ADHD	Attention-Deficit/Hyperactivity Disorder
APA	American Psychological Association
APQ-PR	Alabama Parenting Questionnaire—Pre-school Revision
ASD	Autism Spectrum Disorder
CBCL	Child Behavioural Checklist
CBT	Cognitive Behavioural Therapy
CEFIS	COVID Experiences and Family Impact Survey
CFI	Comparative Fit Index
CHAOS	Confusion, Hubbub, and Order Scale
CI	Confidence Interval
CINAHL	Cumulative Index to Nursing and Allied Health Literature
CPRS	Child Parent Relationship Scale
CRS	Co-parenting Relationship Scale
CSHQ	Child Sleep Habits Questionnaire
DASS-21	Depression, Anxiety, and Stress Scale, 21 items
DfE	Department for Education
DoH	Department of Health
ECBI	Eyberg Child Behaviour Index
EE	Expressed Emotion
ERQ	Emotion Regulation Questionnaire
FFMQ-15	Five Facet Mindfulness Questionnaire, 15 items

FMSS	Five-Minute Speech Sample
MBCT	Mindfulness-Based Cognitive Therapy
MBI	Mindfulness-Based Interventions
MBSR	Mindfulness-Based Stress Reduction
MeSH	Medical Sub-Headings
MRC	Medical Research Council
NIH	National Institute of Health
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
OECD	Organisation for Economic Co-operation and Development
ONS	Office for National Statistics
PCR	Parent Child Relationship
PDHS	Parenting Daily Hassles Scale
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PSI	Parental Stress Index
PSQI	Pittsburgh Sleep Quality Index
PSS	Parental Stress Scale
RCT	Randomised Controlled Trial
REDCap	Research Electronic Data Capture
ROB-2	Risk of Bias 2
ROBINS-I	Risk of Bias in Non-Randomised Studies – of Interventions
SCS	Social Competence Scale
SDQ	Strengths and Difficulties Questionnaire

SES	Socio-economic Status
SIPA	Stress Index for Parents of Adolescents
SMD	Standardised Mean Difference
TMRP	Trials Methodology Research Partnership
UKHSA	UK Health and Security Agency
VPN	Virtual Private Network
WEIRD	White, Educated, Industrialised, Rich, Democratic

CHAPTER 1

Background: Child adjustment, parenting, and mindfulness

1.1 Introduction

Parents can be said to have a significant and lasting influence on their children's lives (Kuppens & Ceulemans, 2019). Parenting stress in particular has long been associated with children's adjustment outcomes (Deater-Deckard, 1998). Most developmental research examining adjustment outcomes delineates children's behaviours into two broad-band dimensions comprising sets of narrow-band syndromes: internalising problems (representing disorders predominated by anxiety, depression, and somatic symptoms) and/or externalising problems (representing those with impulse control, disruptive conduct, and substance use problems) (Achenbach et al., 2016; American Psychiatric Association [APA], 2013). Although these two constructs are known to be inter-related, and can contemporaneously covary within individuals (Flouri et al., 2019), externalising problems are more readily identified by parents and teachers (Nikstat & Riemann, 2020; Splett et al., 2019), and have been more robustly linked to the effects of parenting stress (Barroso et al., 2018; Deater-Deckard, 1998). As externalising disorders may iteratively contribute to other mental health concerns including anxiety, depression, and somatic symptoms (D'Urso & Symonds, 2022), the reduction of problematic behaviours in young children is of particular concern if intending to take a prevention focus to target the rising incidence of mental illness in children and young people across the globe (Membride, 2016).

Children's problem behaviours can develop as a result of the way parents are able to manage their own emotions, in particular negative, automatic reactions driven by stress

(Deater-Deckard & Panneton, 2017). A vast array of parenting interventions variously incorporating different theoretical perspectives, some targeted at parents alone and some inclusive of their children, have therefore been trialled to help promote healthy early childhood development. An inclusive definition of parenting interventions might include those aimed to improve parent-child interactions, parent behaviours, knowledge, beliefs, attitudes, or practices with their children, and interventions targeted at parental psychopathology, or any combination of the above (Jeong et al., 2021).

A recent Cochrane review found that the majority of parenting interventions designed to improve the emotional and behavioural adjustment of pre-school aged children were modelled on a behavioural, or cognitive-behavioural therapeutic framework (Barlow et al., 2016). Cognitive Behavioural Therapy (CBT) is a psychological treatment based on the core principles that psychological problems are in part a result of unhelpful ways of thinking and learned patterns of unhelpful behaviour, the symptoms of which can be improved by learning to change the maladaptive thought and behaviour patterns (APA, 2017). CBT has been described as the gold-standard of psychotherapeutic interventions in the West as it is both structured and time-efficient, allowing it to be relatively easily disseminated to individuals in need, and is well-evidenced for a range of psychological issues (David et al., 2018). Within the auspices of CBT is a relatively new generation of interventions incorporating elements of acceptance and mindfulness, sometimes referred to as the third-wave of CBT (Hayes & Hofmann, 2021)—the first wave being understood as behavioural therapy, and the second wave as cognitive therapy (Carona, 2022).

Mindfulness can be thought of as the capacity to deliberately observe present-moment experiences (for example, thoughts, feelings, sensations) with acceptance and without judgement (Creswell, 2017). It can be developed through mindfulness practice, which

typically involves being verbally guided to bring non-judgemental awareness to different aspects of current experience. Mindfulness-Based Interventions (MBIs) are an example of third-wave CBT, and involve regular guided mindfulness practice with the invitation to reflect on experiences of, and learning from, practice. MBIs vary in length and intensity, for example there are light-touch interventions lasting a couple of weeks and requiring 10 minutes of daily practice (Cavanagh et al., 2013), and there are more intensive MBIs lasting 8 weeks and requiring 30-40 minutes of daily practice (Segal et al., 2013). MBIs also vary in delivery format, including in-person group-based (e.g., Segal et al., 2013), self-help book-based (e.g., Williams & Penman, 2011) and digital MBIs (e.g., Taylor et al., 2021).

MBIs have been applied in various ways to help both children and their parents manage stress, with moderate but promising effects (Burgdorf et al., 2019). However, the majority of MBIs reported in the literature have been delivered to parents of school-aged children with a neurodevelopmental disorder (Burgess et al., 2022). As such, there is a lack of evidence investigating self-directed MBIs, accessed remotely by parents, for preventing behaviour problems in younger, typically developing, children. Given the effects of the COVID-19 pandemic on access to services (Pujolar et al., 2022), as well as detrimental effects on children's and parents' wellbeing (Etheridge & Spantig, 2022; Patrick et al., 2020; Thorsteinsen et al., 2022), more accessible, self-directed, remote interventions are an important but under-studied avenue of research (Burgess et al., 2022).

The overarching goal of this thesis, therefore, is to determine the magnitude and meaning of associations between parental mindfulness and pre-school (2-5 years old in the UK) children's adjustment outcomes. This chapter defines the key outcomes of the research comprising this thesis (child adjustment, parent wellbeing and parenting), presents the theory and evidence regarding MBIs in the parenting domain, and explores the methodological

strengths and limitations of the literature. As the methodological implications of the research are discussed, it will be demonstrated how this thesis, using more robust methods, aims to address the gaps identified. In short, by scoping the research investigating MBIs delivered to parents and/or their children (see Chapters 3 and 5), then conducting pilot testing using mixed methods to determine the feasibility and acceptability of implementation from the parents' perspective (see Chapters 4 and 5), as well as methodological feasibility testing using an internal pilot randomised controlled trial (RCT) to assess the feasibility of intervention delivery for a more comprehensive RCT (see Chapter 6). An overview of the subsequent chapters which comprise this thesis is also provided here.

1.2 Children's adjustment

Externalising disorders are defined in the Diagnostic and Statistical Manual, 5th edition, as comprising of primarily outward, observable problem behaviours (occurring in interaction with the social environment), including for example oppositional defiant disorder, conduct disorder, and attention-deficit/hyperactivity disorder (APA, 2013). However, the more common childhood externalising behaviours which can contribute to the development of a disorder in the long term can be better understood as emotional dysregulation such as defiance, tantrums, and aggression, as well as problems with attentional control and an excessive inability to sit still (Kauten & Barry, 2020).

Externalising behaviours are common in young children, in particular poor attentional control and hyperactivity (Van Zeijl et al., 2006). The normal spectrum of these behaviours can be defined as becoming problematic when they begin to cause distress, violate the rights of others, or bring a child into disruptive conflict with authority figures (Kauten & Barry, 2020). Externalising problems are highly susceptible to environmental influence (Samek & Hicks,

2014), whereas internalising problems—characterised by more introspective distress, e.g., anxiety and depression—often receive less attention in younger age groups (Burgdorf et al., 2019; Tandon et al., 2009). Some have argued this gap to be equally as a result of children's verbalising limitations making measuring internalising problems more difficult, as it is a result of the presence of internalising problems being less problematic for the adults around the child (Tandon et al., 2009). Importantly, externalising problems are known risk factors for diverse long-term difficulties, including internalising problems at later developmental stages (Murray et al., 2020).

Externalising problems have been associated with the child being male and the mother being stressed (Bayer et al., 2012). And of note, a cyclical model of antisocial behaviour has been identified whereby the mother and child "train" each other to respond in a way that reinforces the negative behaviours of both (Granic & Patterson, 2006; Patterson et al., 1989). With relevance to future mental health concerns, where depression and anxiety are the most common disorders affecting young people and adults (National Institute for Health and Care Excellence [NICE], 2011), there is a large body of literature proposing a cascade from externalising-to-internalising problems (Murray et al., 2020). Therefore, the prevention of adjustment problems in young children may be understood to have far reaching benefits for mental health beyond childhood (Bayer et al., 2012). This is highlighted by the fact that as many as 21% of preschool children in the West experience emotional or behavioural difficulties (Skovgaard, 2010), and one in eight individuals aged 5-19 years old has a diagnosable mental health disorder (Hillier et al., 2019).

Compounding the existing mental health crisis, the COVID-19 pandemic and associated measures have had substantial detrimental effects for many children, as well as their parents. A recent meta-analysis comparing pre- and post- pandemic cross-sectional data from 21

studies found that most studies reported a deterioration in children and young people's mental health, with worsening depression, anxiety, and loneliness (Kauhanen et al., 2022). In the UK specifically, Bignardi et al. (2021) found that the depressive symptoms of 7–12-year-old children worsened significantly during the pandemic, with standardised depression scores on average 0.74 (measure equivalent to Cohen's *d*) higher during lockdowns than before, with confidence intervals suggesting a medium to large effect (Bignardi et al., 2021). More specifically in terms of pre-school aged children, Jarvers et al. (2023) found a rapid increase in German children's externalising problems following national lockdowns. Of particular significance given the nursery and school closures brought on by COVID-19 is that parental stress and pre-school attendance were the only statistically significant predictors of externalising problems; findings revealed one-point increases in parenting stress resulted in a 0.18 increase in externalising problems, and a 1-hour increase of attendance at pre-school resulted in a 0.05 decrease in externalising problems (Jarvers et al., 2023).

However, longitudinal evidence investigating the direction of relationship between parenting stress and child behaviour problems remains limited (Kochanova et al., 2022). As such, the evidence associating parental stress and child externalising behaviours lies in both directions, with some evidence suggesting reciprocal effects, and inconclusive evidence for whether this association is mediated by other factors (Mackler et al., 2015). For example, from within a family systems perspective, a recent three-wave longitudinal study investigating the relationship between mothers' stress, negative child outcomes, and dysfunctional parenting behaviours, found clear cross-sectional effects but few longitudinal associations, raising important questions about the long-term impact parents may or may not have on child outcomes (de Maat et al., 2021).

1.3 Parenting

A parent's attitudes, beliefs, and actions towards a child contribute in no small part to the emotional climate of the child's development (Dalimonte-Merckling & Williams, 2020). The way a parent approaches parenting can be conveyed in discipline choices, through body language, tone of voice, emotional displays, and quality of attention (Dalimonte-Merckling & Williams, 2020). In research, the act of parenting has been considered variously as parenting practices, parenting dimensions, and parenting styles. Parenting practices can be defined as specific, observable behaviours used to socialise children (Darling & Steinberg, 1993)—for example, regular supervision of homework may promote academic achievement. The relationships between these parenting practices have been modelled using factor analytic techniques to identify at least two broad dimensions of parenting—parental support and parental control (Kuppens & Ceulemans, 2019). Although an appropriate level of control has been linked to positive outcomes, the absence or excess of it is commonly associated with both internalising and externalising problems (Barnes & Farrell, 1992; Coie & Dodge, 1998; Galambos et al., 2003; Patterson et al., 1984). Parental support, however, has been linked to a range of positive outcomes including the prevention of problem externalising behaviours (Shaw et al., 1994).

Some researchers have argued that specific combinations of parenting practices are particularly salient for child development, separate from the dimensions of support and control, which form patterns of behaviours called parenting styles (Kuppens & Ceulemans, 2019). Baumrind (1971) initially identified three distinctive styles; authoritative (a combination of both warm/supportive and behavioural control parenting practices), authoritarian (an excess of controlling practices based on inflexible standards of behaviour), and permissive (an excess of warmth and autonomy for the child) (Baumrind, 1971).

Subsequently attempts have been made to combine this typology with the concept of parenting dimensions, whereby a fourth parenting style was identified (indifferent—describing parents who are neglectful), and it was argued that parenting may be better conceptualised as falling along two orthogonal dimensions—responsiveness and demandingness (Dalimonte-Merckling & Williams, 2020; Maccoby & Martin, 1983).

Responsive parenting behaviours are typified by warmth, sensitivity, supportiveness, and being receptive to a child's individual needs. Demanding parenting behaviours are expressed in parental supervision, discipline, and willingness to respond to the child if they disobey. Authoritative parents score highly in both demandingness and responsiveness, whereas, for example, indifferent parents score low in both dimensions (Maccoby & Martin, 1983). Although similar to the parenting dimensions of support and control, they are not identical, and Maccoby and Martin's (1983) primary efforts were focused on configuring the parenting styles rather than associating them with children's outcomes (Kuppens & Ceulemans, 2019). Baumrind's typology of parenting styles, however, was extensively empirically validated, although it has since been criticised for being determined on theoretical grounds which fit parents into predefined groupings rather than looking for data driven groupings (Kuppens & Ceulemans, 2019). More recently, clustering methods which assess parents on different parenting practices and then look for naturally occurring patterns in the data have consistently identified three or four parenting styles which resemble Baumrind's initial theory (Beato et al., 2016; Carlson & Tanner, 2006; Heberle et al., 2015). As a result, a recent cluster analysis with 600 European mothers and fathers found support for authoritative, authoritarian, and neglectful (indifferent) parenting styles (Kuppens & Ceulemans, 2019). It is these three parenting styles that will be referred to when discussing the theoretical model of parenting stress and child adjustment in this thesis.

Having said this, these traditional conceptions of parenting styles are coming under further scrutiny as greater attention is being paid to culture and context (Smetana, 2017). Authoritarian styles are reported to be commonplace in non-Western societies, as well as within lower socio-economic status (SES) families (Lee et al., 2014). This may suggest that such practices are not necessarily maladaptive, but may even be beneficial in negotiating survival in the absence of financial, social, and cultural capital (Lee et al., 2014), and in fact that their prevalence may have been misattributed to some cultures as a result of implicit bias in Western research (Chao, 1994; Smetana, 2017).

Being mindful of this Western, White, middle-class centric bias in research (Henrich et al., 2010), the hallmarks of authoritarian parenting—including shouting and shaming—have still been shown to have detrimental effects on children's wellbeing. These negative effects appear to occur irrespective of culture (Smetana, 2017), although they are more pronounced where the parenting behaviour is less culturally normative (Gershoff et al., 2010). This suggests that the relationship between children and their parents is indeed dynamic and socially constructed by norms and values within the wider society that the family finds themselves in (Trommsdorff & Kornadt, 2003). Considering the family as a fluid social construction has implications for researching the effects of mindfulness on parenting behaviours, as it may be more beneficial for both parent and child outcomes to understand the relationship between both them and their environment (Hinde, 1991)—in particular parenting stress, and its systemic exacerbators. However, as previously stated, the relationship between parenting and children's behaviours is dynamic and complex—with recent longitudinal research supporting a transactional model which includes bidirectional associations between parenting stress and child behaviour, although this was demonstrated

to be parent-driven in the case of internalising problems, and potentially child-driven, with cross-lagged effects, for externalising problems (Rodriguez et al., 2019).

1.4 Parenting and stress

The psychological experience of "stress" is the discrepancy between perceived demands and abilities to cope with them, determined from the continuous interaction between a person and their environment (Lazarus & Folkman, 1984). Stress is understood to be role specific (Creasey & Reese, 1996), and therefore parenting stress can be more specifically differentiated within this broad definition to be as a result of the demands of parenthood exceeding what an individual determines to be their parenting capacity (Östberg et al., 2007). This has been studied in a variety of contexts, with both mothers and fathers, as well as children of all ages (Deater-Deckard, 1998; Deater-Deckard & Scarr, 1996; Esdaile & Greenwood, 2003; Golfenshtein et al., 2016; Huizink et al., 2017; McBride et al., 2002).

Parenting stress can manifest as aversive psychological and physical reactions to parenting, including negative feelings and beliefs about the self as a parent, and about the child (Deater-Deckard & Panneton, 2017). Separate from other forms of stress (e.g., related to relationships, or work) which a parent can simultaneously experience (Deater-Deckard, 2008), parenting stress can be understood in two main ways—the so-called parent-child-relationship (PCR) perspective (Abidin, 1990), and a daily hassles perspective (Webster-Stratton, 1990). These are not contradictory theories, however, they examine the causes and effects of stress differently. The PCR perspective posits that there are three main sources of stress in parenting, the parenting domain (aspects of the parents themselves, for example, mental illness), the child domain (aspects of the child, for example, neurodiversity), and the parent-child relationship domain (aspects arising during interactions) (Deater-Deckard, 2008).

The daily hassles perspective on parenting stress as presented by Deater-Deckard (2008) highlights the importance of small daily events (such as getting dressed), as opposed to major stressors (such as divorce). These daily hassles can cause stress which become persistent and magnified sources of parenting stress, and go on to have the most impact on development within most parent-child relationships (Crnic & Low, 2002; Deater-Deckard, 2008). Daily hassles are separate from things that merely annoy parents—in order for a daily hassle to cause parenting stress, they must have the potential to threaten the parent's identity or role (Wheaton, 1999). This can be thought of as being more closely related to the perception of the hassle (i.e., the cognitive appraisal of an event), by both parent and child, within the context of their relationship, as opposed to the objective intensity of the hassle itself (Deater-Deckard, 2008), which is implicated in the extent to which parenting stress is managed differently by different individuals.

Stress has been demonstrated to change over the course of parenthood, as the demands of the child, and the skills of the parent at meeting these changing demands vary (Umberson et al., 2010). At any age, and from any source (whether parent, child, or the relationship), stress can cause a decline in the quality and effectiveness of parenting behaviours, which impacts on the child's reaction, as well as the quality of the parent-child relationship (Azhari et al., 2019; Deater-Deckard, 2008; Fonseca et al., 2020). These declines in the quality of parenting include fewer expressions of warmth and affection, more frequent use of harsher discipline methods, or more expressions of hostility towards the child, as well as more inconsistency across parenting behaviours (Fonseca et al., 2020). In more extreme cases, some child abuse potential theorists have posited the declines in parenting quality as a result of parenting stress may contribute to the total withdrawal of the parent from their role, and/or maltreatment and abuse (Miragoli et al., 2018). In the more common spectrum

of experience, parents may raise their voice more frequently, or criticise the child more harshly, which may cause their child to react with aggression or noncompliance, which then contributes to the parents' appraisal of the situation as being stressful (Cherry et al., 2019). This negatively reinforcing cycle of automatic reactions from both parent and child are thought to explain the main effects of parenting stress on children's outcomes.

This may be particularly significant for very young children who spend a greater proportion of their time at home, as the costs of childcare outside the home more often than not leaves the majority of daily caregiving responsibility to parents (Office for National Statistics [ONS], 2021a). This has been compounded by changes in working patterns whereby (in families comprised of couples) for the first time it is now more common for both parents to be in full-time employment than any other working dynamic (ONS, 2021a). Although not necessarily a given that working parents will be more stressed, time scarcity is a known concern regarding the quality of family interactions as demands on parents' time may limit their opportunities for restorative activities to maintain health and wellbeing (Craig & Brown, 2017). The implications of this for child outcomes can be seen in a recent cohort study conducted in Toronto, Canada, where it was found that otherwise healthy pre-school aged children with parents who reported increased stress during their infancy had a two times higher odds of mental health problems at 3 years of age (Hattangadi et al., 2020).

Having summarised the key outcomes, children's adjustment problems, parenting, and parenting stress, an overview of the theory and evidence regarding a promising intervention for improving both parent and child outcomes—mindfulness—now follows.

1.5 Mindfulness-Based Interventions (MBIs)

Mindfulness can be described as a deliberate, non-judgemental focus on the present moment, whereby individuals learn to intentionally notice and accept experiences as they arise (e.g., thoughts, feelings, sounds, sights, and sensations), allowing these experiences to be as they are in that moment (Creswell, 2017). Mindfulness can therefore be usefully operationalised by grounded attention, and non-critical acceptance of thoughts and emotions (Quaglia et al., 2015). Although mindfulness has roots in Eastern traditional Buddhist meditative techniques (Baer, 2003), it has more recently been separated from any cultural heritage and applied as part of a broad range of secular MBIs (Kabat-Zinn, 2003). In its secular form, mindfulness was first applied in Western healthcare to treat chronic pain, as part of a programme called Mindfulness-Based Stress Reduction (MBSR) (Kabat-Zinn, 1990), and subsequently in psychiatry to treat depression relapses by combining mindfulness and CBT to form Mindfulness-Based Cognitive Therapy (MBCT) (Segal et al., 2002). Both MBSR and MBCT are rigorously manualised in order to be more easily operationalised for application across a variety of health and wellbeing contexts where it might benefit an individual to improve their stress management (Kabat-Zinn, 2003).

Whilst this dissociation from cultural and religious ties has been criticised for undermining the fundamental meaning, and therefore efficacy, of meditation exercises (Marx, 2015), secularisation can simultaneously increase the accessibility of mindfulness practices, and therefore its implementation potential for a broader range of families than those with more explicit cultural and religious ties (Shlonsky et al., 2016). The distinction between Buddhist mindfulness (*sati*; Marx, 2015) and secular mindfulness as applied in Western contexts, is important to make as these different perspectives have generated

different approaches to apply mindfulness as a tool to improve wellbeing, resulting in two generations of MBIs.

First generation MBIs are often described as being part of the third wave of CBT (Hayes & Hofmann, 2021)—an umbrella term for acceptance-based therapies which emphasise experiential strategies such as mindfulness, where the first wave of CBT can be considered as behavioural therapies and the second as cognitive therapies (Carona, 2022). Within the auspices of third-wave CBT, MBIs have diverse clinical applications, which focus on acceptance and metacognition as opposed to an explicit emphasis on re-evaluating the accuracy of unhelpful thoughts and beliefs as seen in second-wave CBT (Crane et al., 2017). These first generation MBIs (based on MBSR and MBCT) are the most robustly researched within psychology (Crane et al., 2017). The second generation of MBIs are more novel, including Meditation Awareness Training, and have been developed in reaction to the perceived watering down of mindfulness as a result of its secular application (Purser, 2019). Second generation MBIs are more closely tied to the spiritual and traditional elements of Buddhist meditation (Van Gordon & Shonin, 2020). However, as the former is the more robustly researched, and approaches based on an MBSR framework are the most common manualised MBI applied rigorously in the parenting context (Burgdorf et al., 2019), it is these first-generation interventions that will be the focus of this introduction.

First generation MBIs, whilst varying in contextual application and population adaptations, are proposed to share five key components (Crane et al., 2017). These include that MBIs be (i) informed by theory and practice drawn from a combination of early Buddhist psychology, modern psychological and medical science, and education, (ii) that its approach to relieving suffering is modelled by addressing the causes of distress via attention and

executive control, (iii) that it de-centres experiences using an approach orientation, characterised by a focus on the present, (iv) that it develops an individual's emotional and behavioural regulation as well as compassion and wisdom, and (v) that it involves training and sustained practise to develop insight (Crane et al., 2017). These elements vary across programs, although it can be said that most MBIs delivered to parents are based on a variation of MBSR (Burgdorf et al., 2019), generally delivered over 8-12 weekly sessions with extended practice at home, utilising a standardised framework to guide practitioners (Bögels et al., 2010). These are usually delivered in-person, in a group format (Burgess et al., 2022), however, treatment specifics, including fidelity and adherence are not widely or rigorously reported (Burgdorf et al., 2019; Crane et al., 2017). Therefore, the following section will focus on the theory and proposed mechanisms behind MBIs in parenting as opposed to the specific nuances of different interventions.

1.5.1 Mindfulness in parenting

Mindfulness was first applied in Western science to parenting by Kabat-Zinn and Kabat-Zinn (1997), by whom it was presented as a fundamental parenting skill (Duncan et al., 2009). However, it is important to differentiate parental mindfulness from the concept of a parent's dispositional mindfulness (Parent et al., 2016)—in this thesis, a self-directed mindfulness-based app (*Headspace*) is used to improve parents' dispositional mindfulness. Dispositional mindfulness can be understood as a trait—a person's innate capacity to deliberately bring non-judgemental awareness to present-moment experiences, with varying abilities to do so among the general population (Brown & Ryan, 2003). Whereas, mindful parenting, or parental mindfulness, applies this characteristic to the focal point of the social relationship between the parent and child specifically (Kil, 2018). Although associated constructs (someone who is more dispositionally mindful is more likely to show higher levels of mindful

parenting; Gouveia et al., 2016), due to the focus of non-judgemental acceptance on the parent-child relationship, it may be theorised that improving dispositional mindfulness more broadly may have further reaching impacts for parents in other areas of their lives due to the acceptance and non-judgemental awareness *not* being focused directly on one aspect of their life. I.e., improving a parent's dispositional mindfulness may more readily help them to be more accepting and non-judgemental of a range of experiences (including parenting), rather than teaching them mindful parenting specifically, where they learn the skills of acceptance and non-judgemental awareness directly applied to the context of their role as parents (Duncan et al., 2009).

Whether interventions aim to improve dispositional or role-specific mindfulness, when practiced by parents, mindfulness is proposed to reduce stress, improve emotion regulation and cognitive reappraisal, thereby reducing conflict within families where rigid patterns of behaviour have become automatic and negatively reinforcing (Dumas, 2005). By cultivating a non-judgemental acceptance of the current moment, mindfulness encourages the perspective that the experience will pass, allowing for greater cognitive flexibility and the recognition that perception is not necessarily factual (cognitive reappraisal) (Brown & Ryan, 2003; Wallace & Shapiro, 2006). Via careful practice to harness attention away from automatic judgements of good or bad, mindful awareness provides a choice in responding, rather than reacting to, experiences (Duncan et al., 2009). Supporting this, MBIs have been demonstrated with neuroimaging to change the functioning of brain structures—most notably the insula—implicated in awareness of internal reactions and automaticity (Young et al., 2018).

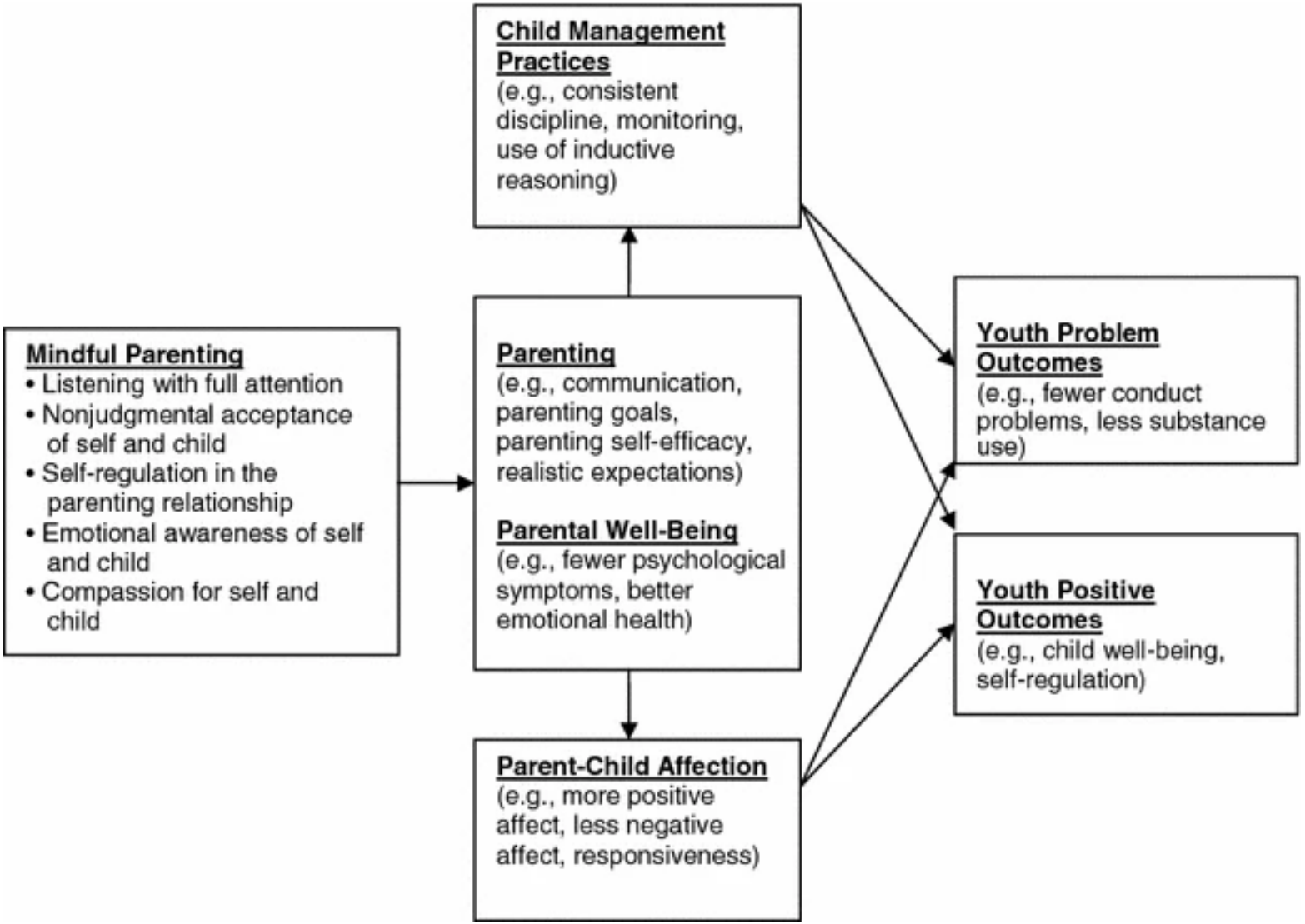
As the evidence base demonstrating the positive effects of mindfulness is growing, to investigate MBIs rigorously it is helpful to understand the theoretical framework

underpinning interventions for parents, and from within which this thesis is working. As such, Duncan et al.'s (2009) model of mindful parenting will be used, which proposes that the mechanisms of action for MBIs involve the following five dimensions; (i) listening with full attention, (ii) non-judgemental acceptance of the self and child, (iii) emotional awareness of the self and child, (iv) self-regulation in the parenting relationship, and (v) compassion for the self and child (Duncan et al., 2009).

According to this model of mindful parenting, the five dimensions can be related to specific parenting behaviours that are promoted and/or decreased by the attributes and/or skills to be practiced in each (Duncan et al., 2009). For example, listening with intention may allow parents to more accurately discern a child's behavioural cues, thereby reducing the influence of their cognitive distortions and expectations being imposed on the behaviour (Duncan et al., 2009). Non-judgemental acceptance of the self and child may promote a parent's self-efficacy, and reduce their reversion to self-directed concerns (i.e., improve their perception of the situation) (Duncan et al., 2009). Emotional awareness of the self and child may allow parents to respond to a child's needs, and reduce the likelihood of their dismissing the child's concerns (Duncan et al., 2009). Self-regulation may allow parents to behave in a way that is more in line with their goals and values, as a result of responding to their child rather than reacting to them from a potentially volatile emotional state (Duncan et al., 2009). And finally, compassion for the self and child may promote a more accepting view of the parent's own efforts, and reduce self-blame when parenting goals are not achieved (Duncan et al., 2009)—thereby reducing the negative perception of self and child inherent to the stress response described by Deater-Deckard (2008). Figure 1.1 demonstrates these hypothesised mechanisms of action for key aspects of the parent-child relationship, as described by Duncan et al. (2009).

Figure 1.1

Relationships between mindful parenting, parent-child relationships, and youth outcomes, visualised by Duncan et al. (2009)



However, a common criticism of this model is the lack of empirical evidence elucidating correlates, determinants, and mechanisms of change in mindful parenting over time (Cowling & Van Gordon, 2021). Rather than testing the underlying theory, most of the evidence using Duncan's (2009) model of mindful parenting has focused on the development and efficacy of MBIs, often implementing non-experimental, cross-sectional designs and correlational analyses which are not appropriate to determine cause and effect (Cowling & Van Gordon, 2021). Crucially, without testing mediation pathways, and understanding the causal relationships proposed here from increased parental mindfulness to improved children's outcomes via parenting practices, the utility of the model for facilitating interventions is compromised (Gunzler et al., 2013).

The integration of modern science and ancient contemplative wisdom when applying mindfulness to different populations to create interventions—in such a way as is represented by the different concepts in Duncan's (2009) model—presents challenges in maintaining a universal and comprehensive definition of the core elements of mindfulness (Crane et al., 2017). For example, whilst some scholars' emphasise that attention is the central tenant of mindfulness, others accentuate the dynamic interplay of other factors including cognitive, emotional, social, and ethical issues (Grossman & Van Dam, 2011). Similarly to other applications of it, mindfulness in the form of mindful parenting described in Duncan's (2009) model might be variously defined as a therapeutic or an experiential technique, or as a multi-faceted activity, requiring practice and refinement, which does not occur in isolation without the parents' children and other family members (Grossman & Van Dam, 2011). Buddhist traditions dictate that mindfulness cannot be easily extracted and analysed in isolation from inherently interrelated concepts, which presents difficulties when integrating mindfulness into conventional scientific methods in psychology which require constructs to be explicated

and operationalised (Christopher & Gilbert, 2007). Importantly, the lack of evidence elucidating the nature of relationships in this model is an issue because without understanding how the different concepts relate to each other, can lead to re-inventing the wheel over and over again (Borsboom et al., 2021). This can be seen in the mindfulness literature with repetitive intervention testing using protocols that vary substantially, which can be said to impact the integrity of research and practice (Crane et al., 2017; Cowling & Van Gordon, 2021). Furthermore, the intervention testing literature available in this area is most often focused on how mindful parenting directly impacts child and adolescent outcomes, for which meta-analyses have demonstrated mixed results with small effects (Burgdorf et al., 2019). These limitations suggest that Duncan's model of mindful parenting has not thus far been adequately investigated or evaluated in the literature which uses it to support intervention testing—i.e., that the field has prematurely skipped an important step in theory construction (Borsboom et al., 2021; Cowling & Van Gordon, 2021).

1.5.2 Evidence for MBIs in parenting

Whilst the two constructs of dispositional mindfulness and mindful parenting are related (Kil, 2018), much of the literature pertaining to parenting investigates the latter construct. More often than not, mindful parenting interventions are delivered to the parents only, with most participants consisting of mothers with their target child being their sons (Burgess et al., 2022). The majority of these children also have some form of neurodevelopmental or learning disability (Burgdorf et al., 2019). Although MBIs can be seen to be effective at reducing parental stress irrespective of the target child's diagnosis, results for children's outcomes are mixed, with effects for internalising problems potentially being less robust than for externalising issues (Burgdorf et al., 2019).

The gender imbalance in the mindful parenting literature may be explained by the prevalence of externalising disorder diagnoses among boys (Samek & Hicks, 2014), on which parental mindfulness is thought to be more effective (Burgdorf et al., 2019), and the continued designation of mothers as primary care givers (Cabrera et al., 2018). In terms neurodevelopmental disorders, these parents have been shown to experience more stress than parents of typically developing children (Craig et al., 2016), which may explain the prioritisation of this population in the literature. However, prevention of mental health concerns—i.e., intervening before problems become apparent—is a key priority in mental health care and research in the UK (Public Health England, 2018). And mindfulness does show promise in this domain (Potharst et al., 2021), despite the difficulty acknowledged in demonstrating efficacy of preventative interventions for families without clinical concerns (Costello, 2016).

In terms of intervention target (parent only, or parent and child together), a narrative review by Bögels et al. (2010) identified that there is promise for stress reduction in studies which target parents' only. Burgdorf et al.'s (2019) systematic review also found a greater effect on parenting stress for parent only interventions (g = 0.35) in comparison to parallel parent-child interventions (g = 0.18), as well as finding that overall, the small post-intervention reduction in parenting stress (g = 0.34) grew to a moderate effect at 2-months follow up (g = 0.53). This is promising for the utility of MBIs in parenting if it is indeed the case that improvements in children's outcomes occur as a result of parental stress reduction. However, Dimidjian and Segal (2015) identified that more robust research investigating moderator and mediator effects is required to be able to draw such conclusions—a key limitation that this thesis aims to lay the groundwork to address.

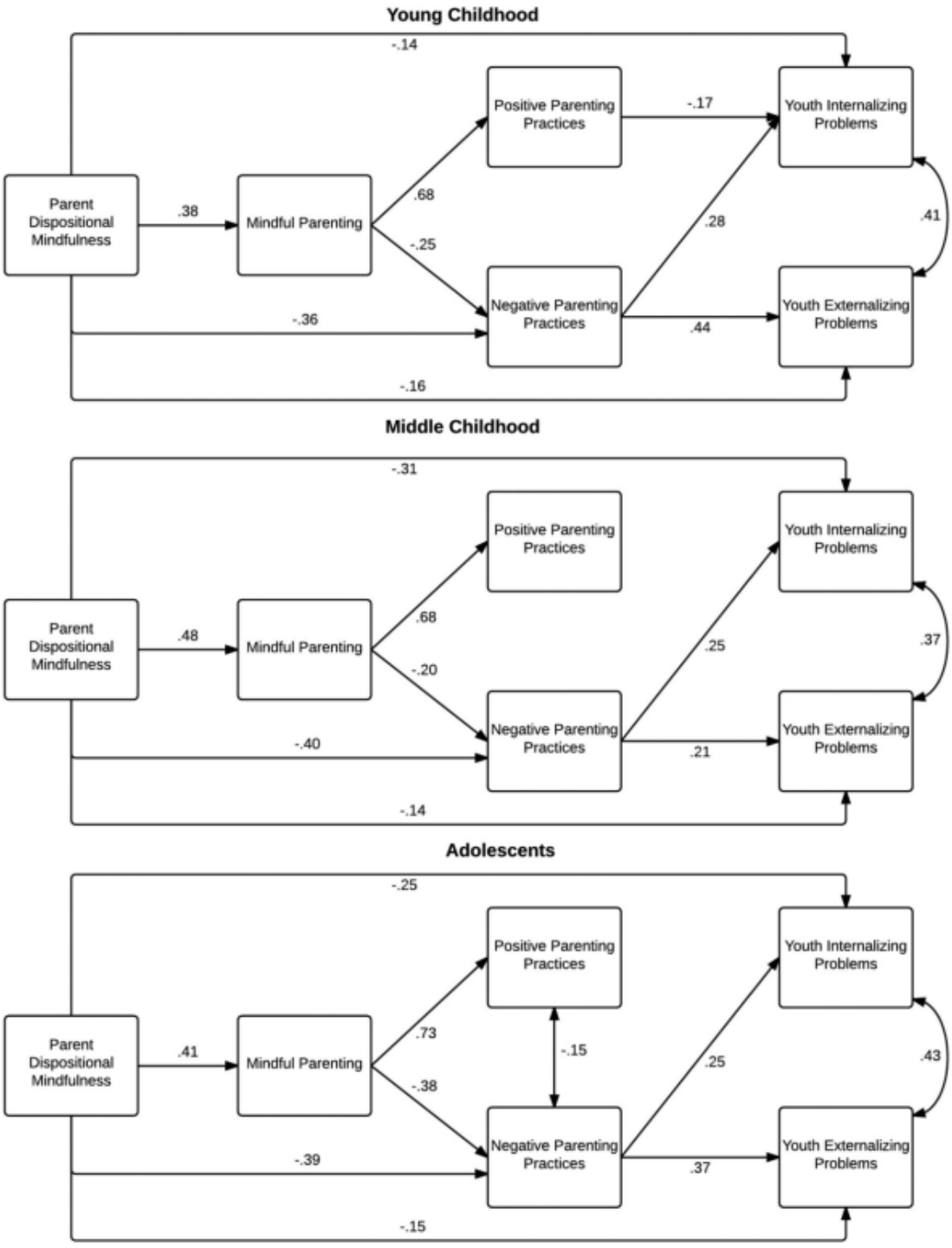
In terms of evidencing the mechanisms of actions identified by Duncan et al. (2009), there is some research to support the paths between mindful parenting, improved parenting practices, and improved psychosocial outcomes for children (Parent et al., 2016). Mindful parenting has been negatively correlated with dysfunctional parenting styles (de Bruin et al., 2014), and is associated with reductions in both children's internalising problems (Geurtzen et al., 2015) and externalising problems (Parent et al., 2010). Higher levels of mindfulness have also been associated with improved parental well-being cross-sectionally (Parent et al., 2010). However, given the limitations of cross-sectional designs for exploring causal relationships, the literature remains of poor quality, and even when involving experimental manipulation, most studies test mindful parenting interventions with small sample sizes, narrow age ranges of children included, and therefore limited generalisability beyond the samples tested (Parent et al., 2016).

As such, Parent et al. (2016) proposed and tested a path model based on the work of Duncan et al. (2009), intending to produce a more comprehensive model that accounted for the impact of a parent's dispositional mindfulness on their mindful parenting practices and youth psychopathology, including both younger and older children. The final structural model with excellent fit statistics (measured using comparative fit index (CFI) where > .95 is excellent; here CFI = 1.0) found in a sample of 615 parents of children aged 3-17 is available in Figure 1.2. Using this model, Parent et al. (2016) demonstrate by using cross-sectional data that regardless of the developmental stage of the child, parental dispositional mindfulness was associated with mindful parenting, which was in turn linked to positive parenting practices. This is promising for the digital *Headspace* intervention (a mindfulness-based self-help wellbeing app, commercially available for smartphones as a paid subscription service;

Headspace Inc., 2023) incorporated in this thesis, which is tested for its ability to improve a parent's dispositional mindfulness, as opposed to the usual parenting interventions which attempt to influence mindful parenting directly.

Figure 1.2

Path model delineating the indirect influence of parent dispositional mindfulness on parenting and youth psychosocial well-being, visualised by Parent et al. (2016)



1.5.3 Digital, self-directed MBIs

Digital interventions are often self-delivered, although this is not always the case, it is true of the *Headspace* smartphone app tested in this thesis. "Self-delivered" has a loose and interchangeable definition in the literature (Cavanagh et al., 2014), however, here the NICE Guidelines are used to define it as "non-facilitated self-help", in other words, participants use the generic *Headspace* app without personalised guidance or support. In particular, *Headspace* "is a self-administered intervention, which makes use of written or electronic materials" (NICE, 2011). Whilst there is a growing evidence base to support the theory that mindfulness is associated with improvements in both parent and child outcomes, as demonstrated by Parent et al. (2016), there is comparatively little robust literature investigating the interventions which may help to improve mindfulness in parents (Burgdorf et al., 2019). In particular, there is sparse research investigating digital modes of delivery (Burgdorf et al., 2019).

The lack of digital intervention testing is a pertinent issue given the effects of COVID-19 restrictions on the capacity of services to deliver in-person interventions safely and cost-effectively (Anderson et al., 2021; Goyal et al., 2021; Pandit, 2020). Given that most of the MBIs delivered to parents are based on the MBSR framework which involves a level of expertise on the part of the facilitator delivering the intervention (Burgdorf et al., 2019; Crane et al., 2017), it is not surprising that the literature has focused almost exclusively on interventions delivered in-person, often in a group format, facilitated by a trained therapist (Burgdorf et al., 2019). However, even before lockdowns began, there can be multifarious barriers to in-person participation. These can include situational and psychological factors, as well as limited resources of both parents and services delivering the intervention (Koerting et

al., 2013). Barriers to participation have been demonstrated to disproportionately affect parents in greater need of support (Gardner & Leijten, 2017; Koerting et al., 2013), and whilst face-to-face interventions (in the UK, mostly delivered by the National Health Service [NHS]) are often plagued with long-waiting times (Thorlby et al., 2019), digital app-based interventions are a potentially immediate avenue of support. They also hold the promise of being able to reach a wide range of parents, with over 90% of adults owning at least one smartphone (ONS, 2021b)—highlighting the utility of incorporating digital interventions into the evidence base.

1.5.3.1 Acceptability

Despite their utility, and the accessibility and cost-effectiveness of digital interventions, there is anecdotal reluctance towards their more widespread implementation amongst both service users and professionals. This has been measured using the Attitudes Towards Psychological Online Interventions questionnaire (Schröder et al., 2015), which highlights that there are three domains of reticence, including scepticism and perception of risks, confidence in effectiveness, and technologization threats. In the case of mindfulness specifically, there are concerns that self-directed practise may result in higher rates of attrition (Taylor et al., 2021), and for unguided MBIs, that they may also result in a greater frequency of adverse events (Farias et al., 2020). However, monitoring of negative effects is often poorly reported and data comparable to the 5-10% frequency of lasting negative effects reported for other low-intensity (self-directed) psychological therapies is not available (Taylor et al., 2022a).

Furthermore, there are concerns regarding the erosion of the therapist relationship which some argue may be the crux of effective intervention at the community level (i.e., in

the case of MBIs, that there is inherent value in having a mindfulness practitioner leading sessions) (Howgego et al., 2003). However, there is evidence that the necessity of therapist contact in community interventions has been overstated (Stevenson et al., 2003). This suggests that increasing the acceptability of digital, self-directed interventions may lie in addressing preconceptions of digital tools, as hypothetical acceptability is often lower than actual acceptability on their implementation (Berry et al., 2016). Furthermore, there is evidence that unguided, self-help MBIs are effective for reducing stress in non-clinical adult populations (Taylor et al., 2021). For example, Spijkerman et al.'s (2016) meta-analytic study on the effects of digital MBIs found a comparable effect size for results on stress (*d* = 0.51 for traditional MBSR/MBCT and *g* = 0.51, 95% CI 0.26, 0.75 for digital interventions), although there were smaller effect sizes for digital interventions in comparison to face-to-face delivery for effects on mindfulness (*g* = 0.32, ranging from 0.4-0.5 for traditional MBIs), and anxiety and depression (*g* = 0.22 and 0.29 respectively, ranging from 0.3 to 0.8 for traditional MBIs). Promisingly, in a more recent meta-analysis of exclusively self-directed, self-help MBIs, Taylor et al. (2021) found similar post-intervention effects on stress (*g* = -0.41), with small effects maintained at follow up (*g* = -0.22).

1.5.3.2 Adherence and feasibility

Although comparable for stress, it has been posited that the smaller effect sizes on other outcomes for digital interventions (mindfulness, anxiety and depression in Spijkerman et al., 2016) may be as a result of poor adherence. In Spijkerman et al.'s (2016) meta-analysis, adherence was not found to be reported widely in the studies included, but ranged from 35-92% in those that did report it (n = 10) (Spijkerman et al., 2016). This is important because the effectiveness of MBIs is known to be related to the amount of time spent practicing the skills

being learnt (Santorelli, 2014). Despite potential issues with adherence, it is promising for the aims of this thesis that the effects on stress were maintained without the traditional approach to delivery. Furthermore, digital interventions are proposed to break down accessibility barriers for some more vulnerable families (Lattie et al., 2022). However, digital MBIs are relatively novel, particularly in the parenting domain, and so there is a need for much wider research to ascertain the best way to implement them in practice (Schröder et al., 2015).

Given the issues with adherence, it is important to consider the differential impact of systemic issues on the feasibility of a self-administered intervention, in much the same way that parenting experiences are differentially impacted by wider social determinants of wellbeing (Nomaguchi & Milkie, 2017). Inequality in particular is an enduring systemic issue for families as parenting stress associated with lower SES is known to be of particular concern for children's adjustment (Reiss et al., 2019). Despite this, only five studies have explicitly investigated the effects of MBIs for low SES families, none of which incorporated a digital intervention (Brown et al., 2021; Chan & Neece, 2018; Eames et al., 2015; Jespersen et al., 2021; Lo et al., 2019). Of these, three did not report any attrition or adherence data (Brown et al., 2021; Chan & Neece, 2018; Jespersen et al., 2021). Of the two studies that did, one was a pre-post single-group comparison of disadvantaged mothers conducted by Eames et al. (2015) which demonstrated attrition to be particularly high (48% were lost to follow up) in comparison to that reported in other studies investigating MBIs for parents and/or their children (see Chapter 3). In contrast, the only other study specifically investigating low-income families which also reported attrition, found that 91.5% of participants completed the intervention, with an attrition rate of 3.92% in the intervention groups (Lo et al., 2019). The authors suggest that the equanimity of attrition in this low SES population with other

populations targeted by MBIs may have been as a result of the programme used being a brief and tight schedule designed to fit with busy, working families (Lo et al., 2019)—i.e., the intervention was tailored to suit the intended audience.

There are also substantial cultural and gender differences in the experience of parenting which interact with SES, even within the same Western societies (Chaplin et al., 2005; Lepianka et al., 2010). For example, some research suggests low-income women may hold motherhood in high esteem in pursuit of its value-laden attributes (Banister et al., 2016), which may impact the perception of parenting stress in light of the significance the role has for wellbeing. Both the socio-economic and gender differences in parental stress are perhaps even more pertinent to consider in light of the COVID-19 pandemic. Firstly, women are more likely to take on the brunt of childcare and schoolwork at home, as well as juggling their own work (Alon et al., 2020), and secondly, are more likely to be employed in one of the precarious positions which were lost as a result of the changing economy (McNamara et al., 2021). As such, accessible—remotely delivered—interventions to reduce parenting stress which can be flexible enough to remove the economic and logistical barriers to traditional parenting programmes are an important avenue of psychological research for parents who may be particularly vulnerable as a result of the pandemic (O'Connor et al., 2021).

1.5.3.3 Evidence for digital, self-directed MBIs in parenting

Having discussed the potential of digital interventions, it is important to note that only two published studies (not including two unpublished theses; Loree, 2018; Padgett, 2020) conducted prior to this thesis were designed intentionally to investigate the effects of a digital MBI delivered to parents on both child and parent outcomes (Guo et al., 2020; Potharst et al., 2019). Since the research in this thesis was conducted, there have been an additional six

studies reporting on MBIs delivered digitally to parents (Bear et al., 2022; Hartley et al., 2022; Maher, 2021; Militello et al., 2022; Safer-Lichtenstein, 2022; Wisen-Vincent & Bokoch, 2023).

However, of the studies found after the research in this thesis was started, two are un-published theses (Maher, 2021; Safer-Lichtenstein, 2022), and three were originally intended to be delivered in-person and had to be adapted at short notice to accommodate COVID-19 restrictions (Maher, 2021; Safer-Lichtenstein, 2022; Wisen-Vincent & Bokoch, 2023; see Appendix O). Two studies were conducted pre-pandemic, but published post-pandemic (Bear et al., 2022; Hartley et al., 2022), of which one was intended to be an RCT, however, recruitment and retention proved to be so difficult that semi-structured interviews were conducted and reported on instead to determine barriers to trial participation (Hartley et al., 2022). The other was aimed at post-natal women with children under one year of age (Bear et al., 2022), which focused on mother's post-natal outcomes specifically, and is therefore less relevant to the aims of this thesis—parents of children aged 2-5 years old. The only study which used *Headspace* specifically (Militello et al., 2022) focussed on how digital prompts may be used to increase engagement rather than focusing on parent or child outcomes.

Of the studies conducted and published prior to this thesis, one investigated an MBI delivered to pregnant women, measuring wellbeing outcomes until 1-year post-partum (Guo et al., 2020), and one investigated mothers of children aged 2 to 3.5 years old (Potharst et al., 2019). Given the focus of this thesis on pre-school aged children, and the differential experiences of mothers that can occur during pregnancy and the early post-natal period, as opposed to the pre-school years of childhood (Bear et al., 2022; Guo et al., 2020), the study by Potharst et al. (2019) is perhaps most relevant to the aims of this thesis.

As such, Potharst et al. (2019) conducted an RCT of 76 mothers, of whom 43 were randomised to receive the intervention. The results indicated participants in the intervention group completed an average of 3 out of the 8 sessions they were asked to complete, although it is not possible to compare this figure to in-person MBIs because attendance rates are not often reported (e.g., Burgdorf et al., 2019). Of note, only the parental role restriction domain of the parental stress measure used was improved in this study (Potharst et al., 2019). The other two domains of parental stress which were not improved were parenting problems and the parent-child relationship (Potharst et al., 2019). This is surprising given that it is via these routes that Duncan et al. (2009) proposed mindful parenting may improve parent and child outcomes. It is also surprising given that research investigating in-person interventions have found improvements in both of these domains (Burgdorf et al., 2019).

Although the authors reported 100 participants were needed to achieve a power of 80% (50 per treatment group), and thus the smaller sample size may have resulted in an underpowered analysis, they nonetheless suggest that the lack of improvement in the parenting problems and parent-child relationship domains may be as a result of the absence of a trainer who was able to support participants and provide empathy with their perception of their child (Potharst et al., 2019). Although this raises questions about whether effects were not detected due to sample size issues, it is interesting that despite the differential results for the parenting stress outcome, the authors did find a small effect for improvements in child aggressive behaviour at both post-test (β = -0.33, p = .005) and follow up (β = -0.38, p = .005) reported by the participating mother in the intervention group. This may indicate that the intervention was effective at reducing an element of parental stress which had positive implications for children's outcomes, again, leading to the conclusion that more research to elucidate the mechanisms of action behind this effect is warranted. However, given the

potential impact of an underpowered analysis, consideration should also be given to recruitment and retention to ensure robust hypothesis testing.

1.5.3.4 The Headspace app as a digital, self-directed MBI

Given the potential utility of digital interventions, and the accessibility of a commercially available smartphone app, giving *Headspace* to parents holds much promise. As a company, *Headspace* openly incorporates research into its brand and has collaborated with a range of institutions to produce 40 peer-reviewed published articles, with a further 51 studies being reported as currently in-progress (*Headspace* Inc., 2023). *Headspace* has also previously been shown to have the highest score on a Mobile Application Rating Scale, using the engagement, functionality, visual aesthetics, information quality and subjective quality subscales to measure the quality of mindfulness-based apps (Mani et al., 2015). Furthermore, *Headspace* is one of the most popular mobile health apps, with a reported 70 million downloads and 40 million users in over 190 countries (*Headspace* Inc., 2023).

Whilst no study published before the research included in this thesis tested the *Headspace* app with parents specifically, it has been used with a variety of other populations. In the general adult population, cross-sectionally, *Headspace* has been found to reduce stress and irritability, and improve affect (Economides et al., 2018), as well as enhance self-reported wellbeing (Howells et al., 2016), and improve compassion (Lim et al., 2015), and in a paediatric nursing population, was also found to marginally improve burnout (Wylde et al., 2017). More recently, a robust RCT testing the effects of *Headspace* in comparison to an active control in 2, 182 NHS health care workers found small effects for reductions in depression and anxiety, as well as improvements in wellbeing, self-compassion, compassion for others, and worry (Taylor et al., 2022b). However, whilst the app does hold promise, the size and rigour of

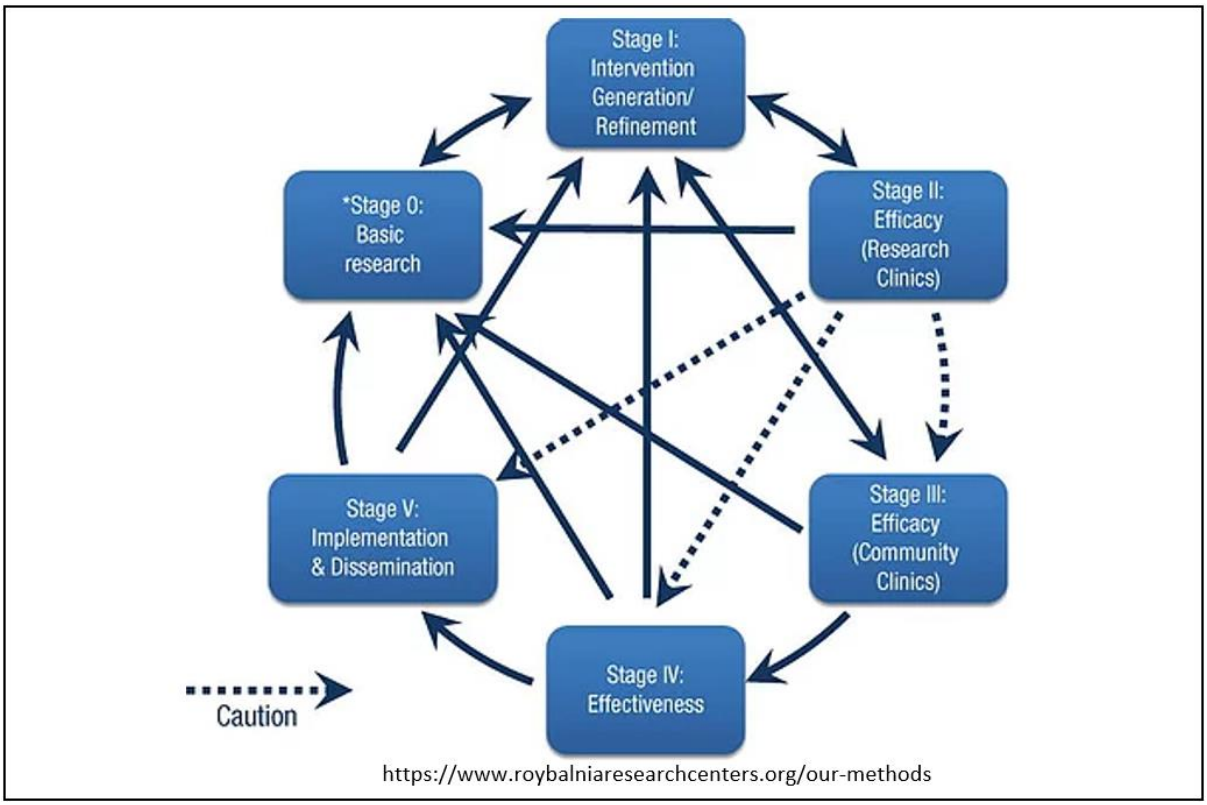
studies investigating *Headspace* is variable (O'Daffer et al., 2022), and prior to the start of the research in this thesis (2019), it had not been tested in a parenting population.

1.5.4 Methodological issues with MBI research

To summarise, as with many complex psychological constructs, definitions of mindfulness and the ways it can be operationalised to form different kinds of interventions can vary widely (Van Dam et al., 2018). Further to this, as a relatively novel field (with publications only exponentially increasing as of 2016; Baminiwatta & Solangaarachchi, 2021), research investigating mindfulness has thus far proliferated at the initial pilot and feasibility stages of behavioural intervention development (Onken et al., 2014). This has led to a surplus of small, poorly controlled, or single-group trials, testing MBIs with different target populations with little emphasis on why mindfulness specifically may be useful for that population (Dimidjian & Segal, 2015). To demonstrate how this thesis addresses some of these methodological challenges, it is useful to describe the National Institute of Health (NIH) stage model for behavioural intervention development which describes six stages of research (Onken et al., 2014; see Figure 1.3 below).

Figure 1.3

NIH Stage model for behavioural intervention development research, visualised by the Centre for Translational Research (2020)



Stage 0 can be described as basic science occurring before intervention development, stage I as the creation and preliminary testing of the new intervention, stage II as efficacy research and stage III as "real world" efficacy research, stage IV as effectiveness research and stage V as implementation and dissemination (Onken et al., 2014). As indicated by the proliferation of small, uncontrolled pilot trials, the mindfulness in parenting literature may be understood to be saturated at stage I (Dimidjian & Segal, 2015). It is difficult to conduct pure efficacy research (stage II) with app-based MBIs as they are self-directed interventions over which the researcher has comparatively less control than more traditional interventions, however, this second stage is where this thesis aims to make a novel contribution to the literature.

It is hoped that this thesis will provide the empirical support for research in stages III and IV, whereby efficacy in the community and effectiveness of the intervention can be investigated with improved external validity, ensuring it reaches those most in need. This is particularly important given the unique context of this thesis (COVID-19). Whilst the majority of the evidence investigating mindfulness in parenting was collected prior to 2020 (Baminiwatta & Solangaarachchi, 2021), the research comprising this thesis was conducted almost entirely during the COVID-19 pandemic. The resulting social, economic, and cultural effects of the pandemic can be seen as the catalyst for a vast array of systemic changes for families, differentially impacting people depending on geographical location and pre-existing social and financial resources (Blundell et al., 2022).

1.5.5 COVID-19 and mindfulness

COVID-19 has had an unprecedented impact on the social functioning of society as well as the psychological functioning of individuals (Chenneville & Schwartz-Mette, 2020). Along with lockdowns, and restricted access to health and social care services, the varying responses to COVID-19 have brought unprecedented uncertainty into many peoples' lives (Freeston et al., 2020). For parents in particular, lockdown measures have been demonstrated to have deleterious effects on their children's behaviour (Neece et al., 2020), and presented unique challenges with combining homeworking and home-based childcare/home-schooling (Weaver & Swank, 2021). In a variety of cross-cultural contexts, COVID-19 may also be seen to have resulted in increased self-reported parenting stress (Adams et al., 2021), loneliness and isolation (Ernst et al., 2022; Groarke et al., 2020; Janssens et al., 2021), reduced access to parental support (Brown et al., 2020), and increased parent-child conflict (Bate et al., 2021; de Jong et al., 2022; Liu et al., 2021).

Despite these reported negative effects, however, qualitative studies conducted with parents during the initial stages of the pandemic have consistently found that some parents appreciated the slower pace of life lockdowns provided (Burgess et al., 2022; Neece et al., 2020; Weaver & Swank, 2021). Parents in these studies described what amounts to being more mindful, as lockdowns allowed them to be more present in the moment with their children, noticing and appreciating the little things they do and the simple things that can bring joy (Burgess et al., 2022; Neece et al., 2020; Weaver & Swank, 2021)—i.e., lockdowns interrupted negative parent-child cycles, allowing some parents time to respond rather than react to their children's behaviour (Parent et al., 2016). Via cross-sectional research conducted during this time, mindfulness has been negatively correlated with worry about COVID-19 in both mothers and fathers of kindergarteners (Lam et al., 2022a), has been associated with increases in self-compassion and decreases in dysfunctional ruminations in older children at high school (Calma-Birling & Zelazo, 2022), and has been negatively correlated with parental burnout (Paucsik et al., 2021). Following a mindfulness training programme, adolescents have also demonstrated improvements in sleep, emotion regulation, executive function, and reductions in post-traumatic stress disorder symptoms during lockdowns (Miller et al., 2021).

The implication that dispositional mindfulness might be a significant protective factor for both parents and children during a uniquely turbulent time is significant for the aims and context of this thesis. However, conducting research during COVID-19 has presented unique challenges, from study design to data collection, analysis, and publication (Ramos, 2021). Although many researchers were able to quickly transition their studies to remote, digital, recruitment, this does not guarantee equality or diversity in data collection. A disproportionate number of lower-income workers were classified as "essential" workers

during the pandemic (Jooshandeh, 2021), differentially affecting the time they may have had to participate, as well as exclusively remote research exacerbating the impact of the existing digital divide in at-home internet access (Lourenco & Tasimi, 2020). Further to this, as the pandemic has progressed and digital processes continue to replace face-to-face recruitment and data collection strategies, so-called "Zoom fatigue" has become a perhaps more pressing issue. The persistence of online meetings has been argued to lead to a sense of remoteness, as well as encouraging distraction and increasing the psychological demands of the task being conducted online (Williams, 2021).

Beyond the specific issues of remote research, there is some evidence to suggest a progressive increase in the prevalence of anxiety and stress throughout the different waves of the pandemic, with women being more susceptible to both than men (Shah et al., 2021). This is potentially of significance as women have also been reported to bear a gendered burden when balancing work and family life during the pandemic (Adisa et al., 2021). Women are also more likely to seek out online parenting support, despite increasing recognition of the role of fathers in childcare (Baker et al., 2017). Research conducted during the pandemic therefore should perhaps be especially mindful of the gendered differences in experiences of COVID-19. As a result of the far-reaching, differential impacts of the pandemic, explicit efforts have been made to identify and highlight its impact on the theory and evidence of mindfulness in parenting, as well as its impacts on every stage of the research included here.

1.6 The current thesis

In summary, this thesis builds on the previous research investigating MBIs, to test the meaning and magnitude of associations between parental mindfulness and children's adjustment outcomes. However, to expand the extant literature a novel approach to delivery

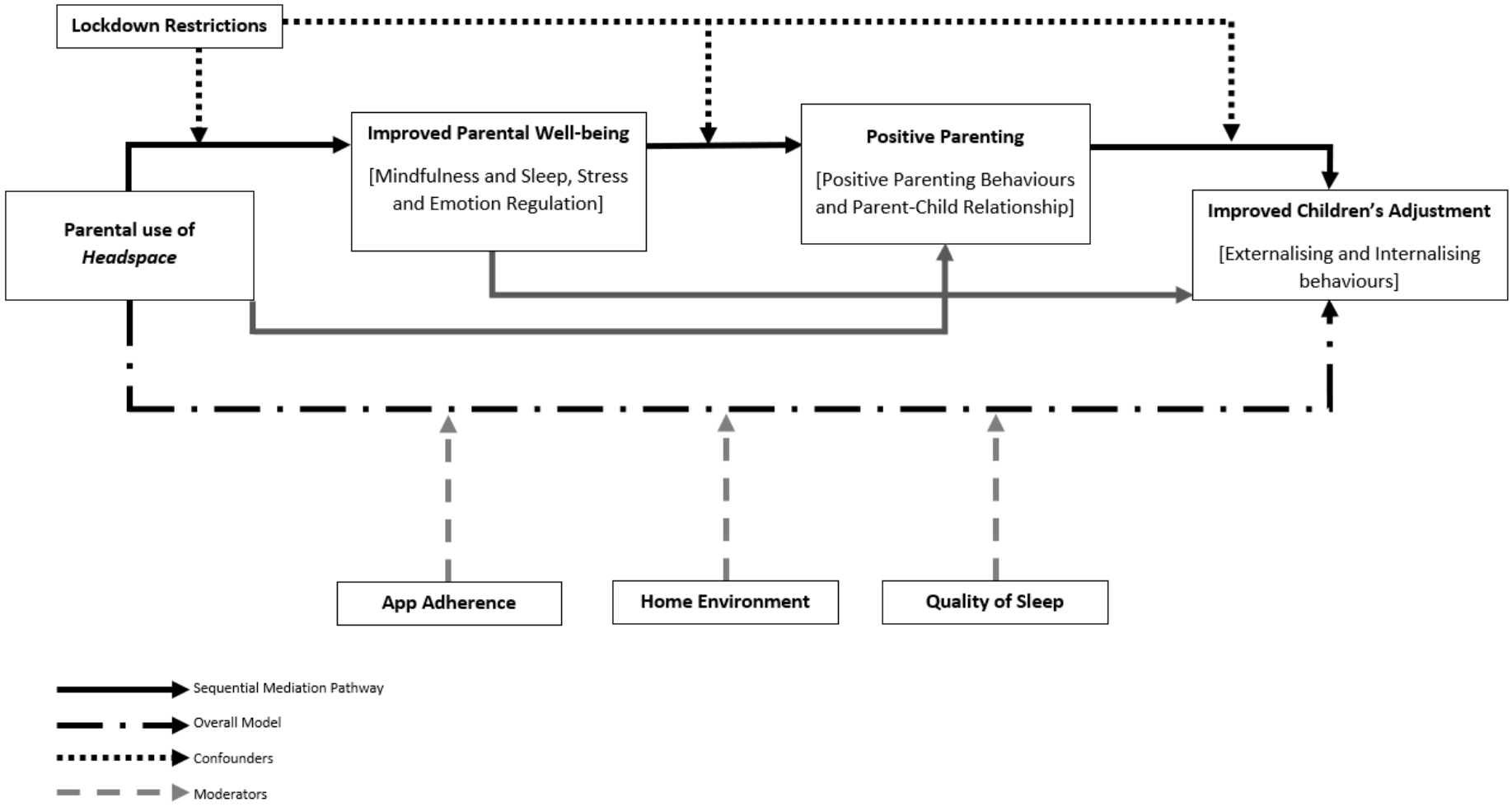
has been taken by using a commercially available smartphone app (*Headspace*). The key considerations when testing the feasibility, acceptability, and preliminary effects of the *Headspace* app are highlighted here.

1.6.1 Important considerations and rationale

Building on Duncan et al. (2009)'s theoretical model of mindful parenting, incorporating the paths identified from parental dispositional mindfulness to child outcomes identified by Parent et al. (2016), this thesis modelled the proposed effects of giving *Headspace* to parents on children's outcomes as displayed in Figure 1.4.

Figure 1.4

Headspace for parents' theoretical model and links



Here, parental use of *Headspace* is intended to improve parents' dispositional mindfulness, which, as theorised and tested in the previous literature, is projected to improve child outcomes via improvements in parental wellbeing and corresponding changes in parenting behaviours which then improve the parent-child dynamic (Duncan et al., 2009; Parent et al., 2016). As young children's externalising problems are common, and more readily identified by parents as problematic (Nikstat & Riemann, 2020; Splett et al., 2019; Tandon et al., 2009), it is this aspect of children's adjustment that is proposed to be the primary outcome of improving parental dispositional mindfulness. Related to this, as a result of the close links between parenting stress and externalising behaviours, it is parenting stress (both general stress, and parenting specific) that was hypothesised to be the most impactful element of parental wellbeing for improving children's outcomes.

However, as the use of *Headspace* is novel in the parenting domain, it was not known what elements of the intervention would be most useful to parents, nor how they would experience using it. Therefore, hypotheses for the first pilot study testing the app (Project 2; see Chapters 4 and 5) were related to the feasibility and acceptability of giving the app to parents, and in the second pilot study (Project 3) were related to the feasibility of an RCT design to test preliminary effects on wellbeing, including sleep because this was widely reported as beneficial in the first study (see Chapter 6). It is also important to note that as this intervention is novel in the parenting domain, all elements of the hypothesised model were tested in both studies.

Importantly, lockdown restrictions should be considered as a potentially relevant confounder on every element of the hypothesised model. Although being more mindful has been reported to have beneficial effects on emotional management and family dynamics

during the pandemic (Burgess et al., 2022; Neece et al., 2020; Weaver & Swank, 2021), due to the varying nature of restrictions and experiences of individual families, COVID-19 may be a particularly dynamic confounder. The specific context of the pandemic in the UK as it relates to family experiences is therefore explained in the following section.

1.6.2 Impact of COVID-19 on the current thesis

The first COVID-19 related restriction on family life in the UK occurred when schools closed on 20th March 2020, and ended for the majority when regular asymptomatic testing at schools was stopped on 1st February 2022 (Department for Education [DfE], 2022; Timmins, 2022). One month later, in March 2022, the UK Health and Security Agency (UKHSA) advised that COVID-19 should now be managed like any other respiratory illness (UKHSA, 2022). In the intervening two years, the UK government's approach to controlling COVID-19 can usefully be split into four categories: full lockdown, partial lockdown, some restrictions, and no public restrictions. The aspects of these different levels of government-imposed restrictions that may be said to have had the most impact on families have been defined here as: access to leisure and hospitality venues, access to school and/or childcare, and working arrangements. From the qualitative literature available exploring family's experiences of COVID-19 lockdowns, these aspects appear to be the most impactful as they restricted parents' access to extra-familiar childcare, and resulted in the balancing of both childcare and working from home (Burgess et al., 2022; Weaver & Swank, 2021). Access to leisure and hospitality venues can be understood as impactful for families in particular, as during weekends and school holidays for school-aged children, and during the regular working week for younger children, access to the local park, zoos, and even restaurants, has been reported

by parents to greatly improve their child's behaviour as a means of avoiding boredom (Burgess et al., 2022; Neece et al., 2020; Weaver & Swank, 2021).

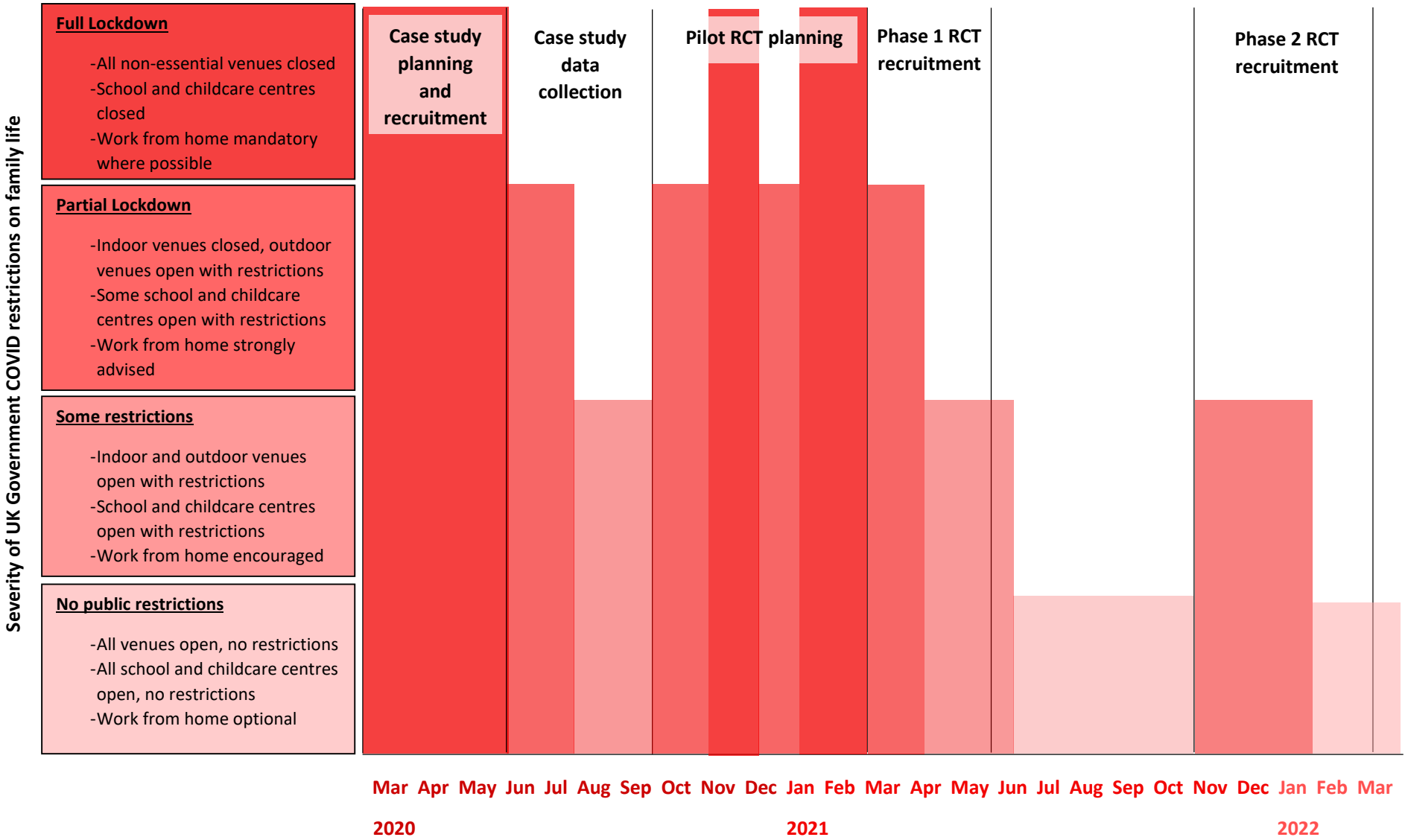
In the UK, but perhaps England in particular, the government of the day were widely criticised for last-minute decision making on restrictions, arguably in an attempt to avoid implementing harsher restrictions for as long as possible (Fancourt et al., 2022). This led to a series of changing rules that varied by location, for example, a tiered system of restrictions was introduced to try and avoid a second lockdown in October 2020 (Smith et al., 2022). Although ultimately, three lockdowns were enacted, the tiered approach has been captured in the diagram below (see Figure 1.5) as a partial lockdown because they so closely followed the implementation of full lockdowns that the lived experience of the tiered system in the UK was arguably not as unrestrictive as it may have been intended at government level.

Figure 1.5 also represents the stages of research involving recruiting participants (i.e., not Project 1, a literature review and meta-analysis) included in this thesis. It is important to note that whilst Project 2 (mixed methods single-group pilot) was heavily impacted by the most severe restrictions, both recruitment phases of Project 3 (internal pilot RCT) came at an equally difficult, albeit different, time for families. As COVID-19 restrictions were lifted over the course of 2021, in an attempt to begin "living with the virus" (Cabinet Office, 2022), the majority of people in the UK continued to work from home (ONS, 2022a). Schools and childcare were also under severe pressures as COVID-19 ran rampant through children's settings with little to no preventative ventilation measures in place, and poor roll-out of the vaccine among under 18s (Williams et al., 2022). Alongside this were increasing pressures to "return to normal", whereby extra-curricular activities including social events returned, whilst parents were still being expected to mitigate the lasting effects of COVID-19 on themselves

and their children (Williams et al., 2022). Therefore, although fewer restrictions were in place, arguably more pressures existed on parents' time, impacting both their need for support and their ability to engage with it (Hartley et al., 2022). A COVID-19 section will be presented at the start of each chapter, with adaptations of Figure 1.5 where appropriate, to provide context for the data collection contained within.

Figure 1.5

Impact of COVID-19 restrictions in the UK on each stage of the research included in the current thesis



1.6.3 Thesis aims

There is a growing evidence base to support the utility of MBIs as a preventative intervention to improve parental mindfulness and thereby reduce parental stress, through which child adjustment may be improved (Burgdorf et al., 2019; Parent et al., 2016). However, there remains a lack of synthesised, robust evidence on the effectiveness of different modes of delivery for MBIs—particularly utilising digital methods—as well as mediator and moderator research investigating mechanisms of action (Dimidjian & Segal, 2015). Therefore, this thesis aimed to:

i) Investigate the direction and magnitude of effects of MBIs delivered to parents aiming to reduce parental stress and improve child adjustment.

ii) Examine the acceptability of delivering a digital MBI to parents of young children via a commercially available smartphone app (*Headspace*).

iii) Understand the feasibility of studies testing the effects of giving the *Headspace* app to parents of young children.

iv) Explore the preliminary effects of parental use of *Headspace* on children's outcomes via the mechanisms of reducing parental stress, improving parental wellbeing, and improving parenting practices.

1.6.4 Thesis structure

To do this, three projects were conducted, each with different aims.

Project 1. From the literature reviewed, mindful parenting interventions can be differentiated by those delivered to the parents alone and those delivered to both parents and children in parallel (Burgdorf et al., 2019). Previous systematic reviews have not

incorporated digital delivery methods when differentiating between different intervention programmes, thus a systematic literature search and meta-analysis was conducted aiming to identify the differences in parent and child outcomes whilst considering whether the MBI was delivered to the parents only or to both the parents and children in parallel, via any medium (i.e., both digital and in-person). The four overarching research questions were:

1. What are the quantitative effects of MBIs on measures of parental stress and child adjustment outcomes?
2. Are there any differences in the effects of MBIs on parental stress and child adjustment outcomes when comparing interventions delivered to parents only to parents and children in parallel?
3. Are there any differences in the effects of MBIs on parental stress and child adjustment outcomes when comparing interventions delivered remotely to those delivered in-person?
4. If effects are found, are these effects robust to sensitivity analysis?

Project 2. As most of the literature aiming to reduce parental stress and improve children's outcomes found in Project 1 was conducted pre-pandemic, in-person, in group format, with parents of adolescents, the proposed use of *Headspace* for parents of younger children as a means of prevention rather than treatment was entirely novel. As such, Project 2 involved conducting a mixed methods single-group pilot study to understand the feasibility, acceptability and potential effects on parent and child outcomes of giving parents access to *Headspace* during the pandemic. The overarching research question, addressed qualitatively, was:

1. What are parents of young children's perceptions and experiences of using a self-directed mindfulness app to manage their stress, in relation to their experiences of being a parent?

And the research questions addressed quantitatively, were:

2. Is it feasible to recruit parents of children aged 2-5 years old to take part in a research study where they engage in daily mindfulness practice using a 30-day introductory programme on the *Headspace* app?
3. Is it feasible to retain parents to the study procedures (i.e., pre-, post-, and follow up measures)?
4. How closely do parents of 2–5-year-old children adhere to daily use of the *Headspace* app for the duration of a 30-day intervention?
5. Does using the *Headspace* app for 30 days improve parents' wellbeing—specifically, their mindfulness, stress, depression, anxiety, and the relationship they have with their child?
6. Does parental use of the *Headspace* app for 30 days improve their children's outcomes—both internalising and externalising problems?

Project 3. The literature investigating mindfulness in parenting has largely utilised pre-post single-group comparisons or pilot trial designs, and most of the RCTs found in Project 1 were at significant risk of bias. Pilot trials and small mixed methods studies are useful in providing rich acceptability and feasibility data which can be used to plan more robust clinical trials (Pluye & Hong, 2014), however, only a very small minority of the parenting literature has investigated digital interventions. As such, Project 3 was planned to be an internal pilot RCT aiming to test the feasibility of scaling the existing protocol to a larger number of

participants. A secondary aim of Project 3 was to test preliminary effects of *Headspace,* building on the findings of Project 2, but using a more robust design than the pre-post single-group study. The overarching research questions were:

1. Is a three-armed RCT with parents of children aged 2-5 years old, testing the effects of using the *Headspace* app for 30 days feasible?
2. Does parental engagement in a programme of self-directed meditation using the *Headspace* app improve children's adjustment outcomes (specifically externalising behaviours)?
3. Does engaging with a programme of self-directed meditation using the *Headspace* app improve parental mindfulness, reduce parental stress and general stress, anxiety and depression, improve parent self-report and parent-report of child sleep quality, improve parental emotion regulation, parent-child relationships, co-parenting relationships and increase positive parenting practices in parents with children aged 2-5 years old?
4. Are there differential effects on parent and child outcomes associated with use of either mindfulness specific content or sleep related content on the *Headspace* app?

An overview of the subsequent chapters in this thesis is provided in the following section, including the specific aims of each chapter.

1.6.5 Thesis outline

Chapter 2: General methods

This chapter outlines the methodological decisions taken in all three projects, as well as the issues shared by both Projects 2 and 3, i.e., details of the intervention (the *Headspace*

app), issues with participant recruitment and retention, and COVID-19 specific adaptions to the originally planned methods.

Chapter 3: Systematic literature review and meta-analysis of mindfulness interventions for parenting stress and child adjustment

This chapter reviews the relevant literature for mindfulness interventions delivered to parents and/or children, measuring effects on parental stress and/or child adjustment. The results of a systematic literature search were synthesised in a meta-analysis, with a focus on method of delivery, remote or in-person, to parents only or to parents and children in parallel.

Chapter 4: Qualitative report on the feasibility and acceptability of *Headspace* for parents during COVID-19

This chapter presents the qualitative findings of Project 2, a small pre-post, single-group study investigating the acceptability and feasibility of delivering *Headspace* to parents of young children, to help manage their stress. It presents a thematic analysis of both semi-structured interviews and five-minute speech sample transcripts to capture parents' perspectives and experiences of using the app, but also their experiences during and immediately following the initial COVID-19 lockdowns in the UK, and the effects these restrictions had on family life.

Chapter 5: Quantitative report on the feasibility, acceptability, and initial effects of *Headspace* for parents

This chapter presents the quantitative findings of Project 2, including the feasibility of recruitment and retention to a study using the *Headspace* app with parents, details of adherence to the app, as well as questionnaire data measuring parental wellbeing,

mindfulness, and child adjustment, and the five-minute speech samples quantitatively coded for expressed emotion. This data was used to plan Project 3, but was not published due to the confounding effects of COVID-19.

Chapter 6: *Headspace* for parents – an internal pilot randomised controlled trial

This chapter presents the findings of an internal pilot trial to investigate the feasibility of a three-armed RCT, as well as the preliminary effects of using the *Headspace* app on parents' wellbeing and child adjustment. A randomised, controlled trial design was utilised to test the effects of using the sleep only content and the mindfulness only content with a waitlist control group; details of recruitment, retention, and app adherence are reported, as well as preliminary effect sizes for parent, child, and parenting outcomes.

Chapter 7: General Discussion

The research findings are summarised, followed by a discussion of key themes. Strengths, limitations, as well as potential implications of this thesis and future directions for research are included here.

CHAPTER 2

General methods

This thesis is comprised of three projects: one meta-analytic review study (Project 1) with a supplementary narrative synthesis (see Appendix O), and two studies which tested the *Headspace* app with parents of young children—a mixed methods pre-post single-group study (Project 2) and a three-armed internal pilot RCT (Project 3). Specific details of the methodology used in the two reviews are contained in Chapter 3 (meta-analysis) and Appendix O (narrative synthesis) respectively. Details of the two samples used in both the *Headspace* studies are also contained in their respective chapters (Chapters 4 and 5 report on the same sample collected for Project 2, Chapter 6 reports on a second sample collected for Project 3).

Although COVID-19 affected the projects in different ways, some methodological decisions are applicable to both the meta-analytic and narrative synthesis review, and both *Headspace* studies utilised similar recruitment and retention methods, to deliver the same mindfulness-based app, and as such the samples were limited by similar issues. This general methods section therefore describes the methodological decisions relevant to the reviews, presents details of the *Headspace* app as well as details of the shared outcome measures used, and contextualises the original plans for both Projects 2 and 3 as well as the ways they were adapted as a result of the pandemic—i.e., retention, recruitment, and analytic issues applicable to both samples.

2.1 Funding and collaboration context

The studentship which funded the completion of this thesis was facilitated by the Economic and Social Research Council (ESRC), in collaboration with an industry partner, *Headspace. Headspace* is a fast-paced and continuously growing online company specialising in meditation, with offices based in San Francisco, US, and London, UK (*Headspace* Inc*.,* 2023). In practical terms, the nature of the funding and the industry partner, meant that the plans for the three projects were outlined to and agreed with the funders before the studentship began in order to secure the collaboration and funding. The industry collaboration involved the research team at *Headspace* delivering free app-access codes for the two projects which involved data collection using the app. This allowed for the analysis of app usage data, recorded by *Headspace*. The industry partner did not contribute to the financial funding of any of the projects, and no direct relationship was maintained with any individual working at *Headspace* due to the aforementioned fast-paced, and therefore often changing nature, of the business, and structure of the research team. To summarise, all three projects were funded by the ESRC, but only projects 2 and 3 involved direct collaboration with *Headspace* to gain access codes to the app for participants and retrieve usage data from the use of those codes.

2.2 Project 1

2.2.1 Methodological background

Given the cumulative nature of science, literature reviews and syntheses which scope fields of knowledge are useful to facilitate clinical decision making and to guide future research avenues (Paré & Kitsiou, 2017). They can provide accessible summaries of rapidly expanding fields where thousands of empirical papers may be published each year, and can

be used to synthesise trends and patterns to allow clinicians a clearer understanding of the latest findings in a particular area (Paré et al., 2015). According to a recent bibliometric analysis, 67% (n = 11, 164) of the 16, 581 publications about mindfulness available on the database Web of Science were published in the five years between 2016 and 2021 (Baminiwatta & Solangaarachchi, 2021). This significant number of recent publications, and its potential clinical utility as a therapeutic tool for a variety of psychological issues (Zhang et al., 2021), demonstrates that mindfulness in particular is an eligible area for a useful synthesis of the literature. Although mindfulness in parenting is a relatively smaller and more novel sub-specialty of the field, it is the focus of this thesis, and therefore was the focus of Project 1.

Methodologically, literature reviews and the resulting data can be synthesised in a variety of different ways, both qualitatively and quantitatively, to answer different research questions (Paré & Kitsiou, 2017). Here, two methods were utilised—a quantitative meta-analysis to aggregate and appraise the empirical evidence for MBIs in parenting prior to COVID-19, and a narrative review to provide a more comprehensive background and understanding of current MBI research in parenting during COVID-19.

2.2.2 Meta-analysis

As a result of the literature presented in Chapter 1 which demonstrates that mindfulness may have some beneficial impacts on parent and child wellbeing, Project 1 was designed to better understand what effects MBIs have on parental stress and/or child adjustment outcomes. This project built on a previous systematic literature review and meta-analysis with similar aims (Burgdorf et al., 2019), by only including RCTs to increase the robustness of the findings, and by incorporating all methods of intervention delivery (i.e., remote and in-person, to parents alone and to parents and children in parallel) in the analysis.

As a result of the relatively homogenous nature of the outcome measures (i.e., all validated scales measuring similar constructs related to parent and child wellbeing), and the adequate number of RCTs found, a quantitative meta-analysis was conducted which allowed for an investigation of magnitude and direction of effect. More details are available on this in Chapter 3.

2.2.3 Narrative synthesis

Importantly, Project 1, and therefore all the studies included within it, were completed prior to the start of the COVID-19 pandemic in March 2020 (Institute for Government, 2022). Conversely, the two studies in this thesis (Projects 2 and 3) that the meta-analysis was intended to complement were conducted *after* COVID-19 started. COVID-19 has been demonstrated to have had a significant impact on both family life (Weaver & Swank, 2021), and research processes (Tuttle, 2020). As such, it was deemed valuable to complete a second literature search using a similar systematic search strategy to Project 1 to find out what the experiences of parents and researchers were when receiving (in the case of parents) or delivering (in the case of researchers) MBIs during COVID-19. As the aim of this second review was to contextualise MBI research during COVID-19, not to generalise cumulative knowledge, and only four studies were identified (not all of which used quantitative outcome measures), a narrative synthesis was employed to combine the results. More details are available in Appendix O.

2.3 Projects 2 and 3

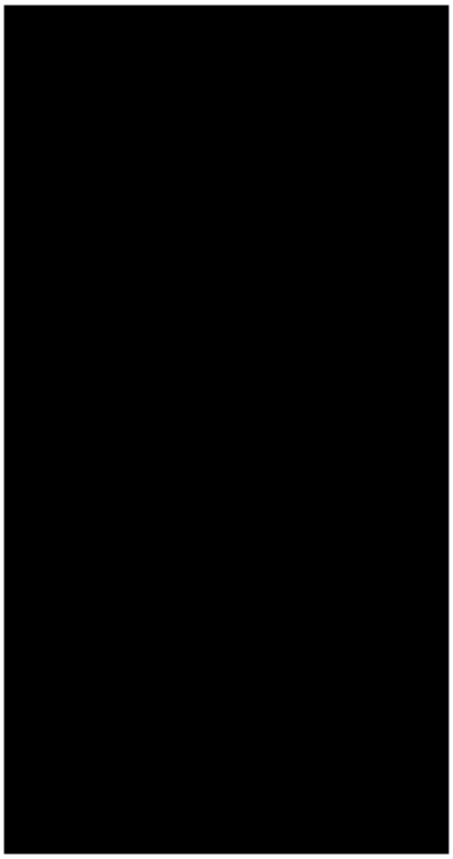
Specific details of the procedures for Projects 2 and 3 are available in Chapters 4 and 5, and Chapter 6, respectively. For Project 2, a mixed methods pre-post single-group study, the study materials are available in Appendices A (recruitment poster), B (introductory email), C

(participant information sheet and consent form), D (*Headspace* access instructions), and E (semi-structured interview topic guide). For Project 3, a three-armed internal pilot RCT, study materials are available in Appendices G (recruitment poster), H (generic participant email templates), I (participant information sheet and consent form), J (introductory call script), K (arm 1: mindfulness group *Headspace* access instructions), L (arm 2: sleep group *Headspace* access instructions), and M (arm 3: waitlist control group *Headspace* access instructions). The debriefing information was the same for both projects (due to using the same intervention, for similar purposes), and is available in Appendix N.

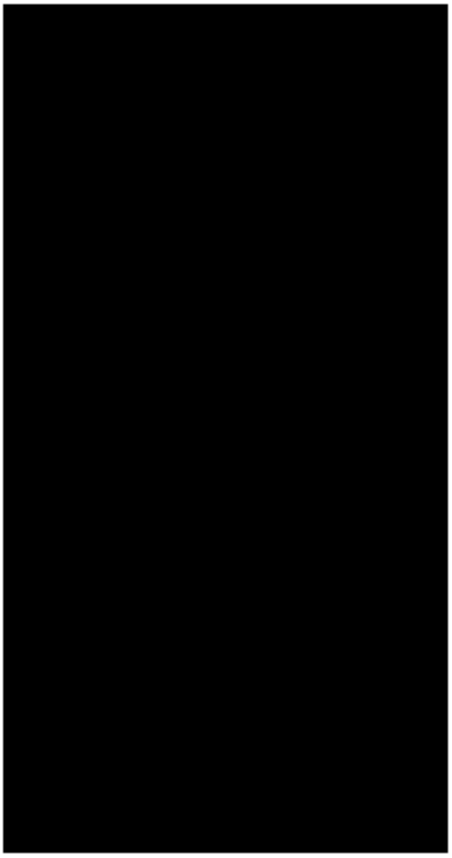
2.3.1 The Headspace app as an intervention

Both Projects 2 and 3 utilised *Headspace* as a self-directed intervention to improve wellbeing. *Headspace* contains a wide variety of meditative and non-meditative content, including guided meditations, sleep aids, music/sounds, and short animations, as well as some content designed for parents and their children to do together. Participants in Projects 2 and 3 were asked to use the app in slightly different ways. The app is regularly updated and so screenshots of it can change frequently, however, instructions given to participants which demonstrate the app as it was available to consumers at the time of data collection are available in Appendix D for Project 2, and in Appendices K and L, for Project 3. To demonstrate the subtle changes in the app's user interface, here, the "explore" page that participants were directed to is available in the screenshot on the left, and the current version of the same "explore" page is shown in the screenshot on the right:

Screenshot of the explore page presented to participants



Screenshot of the current explore page (April 2023)



Project 2. Participants were asked to complete the "Basics" packages 1, 2 and 3 as a guided introduction to mindfulness. Each of these packages lasts for 10 days, thus the intervention period was 30 days. In the Basics package 1, participants were able to choose between 3, 5, or 10 minutes of meditation a day, and in Basics 2 and 3, from 10 or 15 minutes a day. No specification was given for the duration of the mediation chosen, and no strict limitations were placed on their use of the rest of the app.

Project 3. The initial plans for the pilot RCT were formed utilising feedback from the participants in Project 2 (described in Chapters 4 and 5). As participants talked about the benefits of the app for helping them to sleep, more so than improving their mindfulness practice (Burgess et al., 2022), a three-armed RCT with two active intervention groups and a

waitlist control group was planned. One intervention group was instructed to access only mindfulness content on the app, while the other intervention group was instructed to access only sleep content. Participants on the waitlist were asked to explicitly avoid any mindfulness practice. Participants randomised to either of the intervention groups were asked to strictly avoid the rest of the app and only engage with the specified content for the duration of the intervention. They were also explicitly instructed not to use the app with their children for the duration of the study.

Mindfulness only group. Participants were asked to complete the Basics packages 1, 2 and 3, each of which lasts 10 days, and thus the intervention lasted for 30 days (although in this second study, participants were given 40 days in which to complete it). Basics 1 still provided duration options between 3, 5, or 10 minutes of meditation a day, and Basics 2 and 3 also still provided 10 or 15 minutes a day. No specification was given for the duration chosen.

Sleep only group. Within the sleep section of the app, participants had the option to select either sleepcasts (containing some guided relaxation content followed by a story), wind downs (guided relaxation), night-time SOS sessions (guided, sleep-specific mindfulness-based exercises), sleep music, soundscapes (bird song, rain on windows, etc.), or sleep radio (an 8-hour long session combining any/all of the above). Participants were advised to use only one of these elements each night, depending on their preference, but findings from the previous qualitative work suggested parents found the sleepcasts and wind downs to be the most useful. They were asked to complete only 30 days of the sleep content, but were also given 40 days in which to do so.

2.3.2 Aims and hypotheses

Project 2 aimed to test the feasibility, acceptability, and initial effects of giving *Headspace* to parents by measuring a range of child and parent outcomes and app usage data, as well as conducting semi-structured interviews, and collecting pre- and post- intervention five-minute speech samples (Gottschalk & Gleser, 1979) to measure expressed emotion. In terms of effects, it was hypothesised that *Headspace* would result in improvements in mindfulness and reductions in parenting stress when comparing pre-intervention data to post-intervention data collected 30 days later. As the intervention was novel in the parenting domain, and effects had not been demonstrated for parents, no hypotheses were explicitly proposed for children's outcomes, but improvements were anticipated.

Project 3 aimed to build on the results of the pilot study by testing the specific elements of the app that parents qualitatively reported to be most useful in a three-armed internal pilot RCT design. The two intervention groups (mindfulness and sleep content) and waitlist control group were measured on similar child and parent outcomes to the pilot trial, and had their app usage data recorded. The primary outcome was identified as children's externalising behaviour problems, and it was hypothesised that children of parents allocated to the mindfulness arm would show greater reductions in problem behaviours than children of parents allocated to the sleep arm—both of whom would show greater improvements than children of parents allocated to the waitlist-control arm.

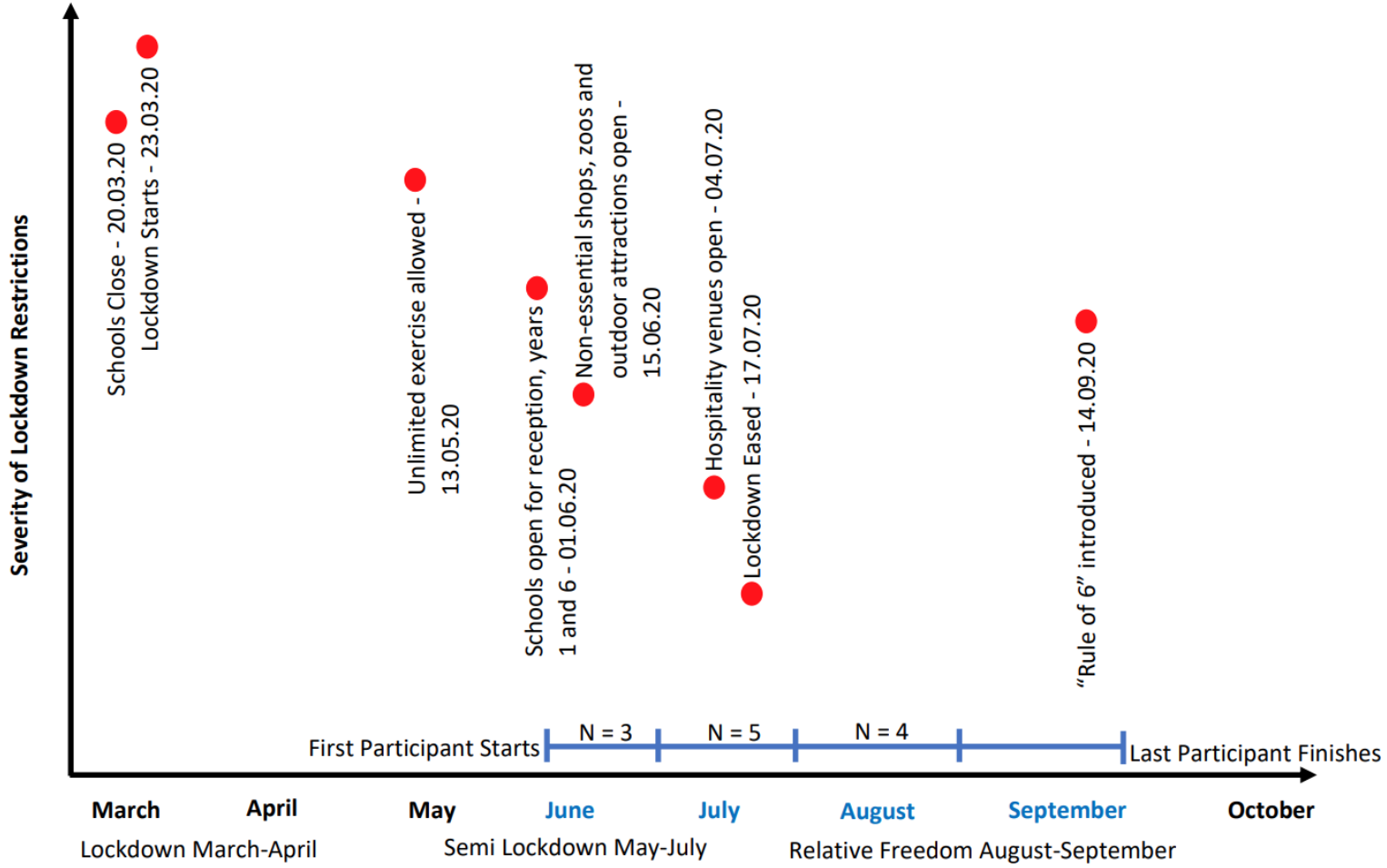
2.3.3 Sample issues

Project 2 was planned as a mixed methods feasibility study, whereby 12 self-selecting parents of 2–5-year-olds were invited to use the *Headspace* app. Although the results of the systematic literature review and meta-analysis that formed Project 1 (see Chapter 3) indicated that there is an overabundance of high SES status, White mothers and their sons in

the mindful parenting literature, extraordinary efforts were not made to diversify the sample beyond those who volunteered to participate as this was the first time the intervention was being tested in this population, and initial feasibility issues were prioritised. In the event, COVID-19 restrictions meant that all recruitment efforts took place remotely which resulted in the predominant use of personal and professional networks. Snowball sampling was utilised to recruit further participants which resulted in a sample of mostly very well educated and relatively privileged White mothers. Recruitment started in May of 2020, with the first participant enrolled in June. As Figure 2.1 shows, this was during a period of considerable turbulence in the UK following the initial March-April lockdowns. Details of inclusion criteria are available in Chapters 4 and 5.

Figure 2.1

Visualisation representing lockdown restrictions in the UK over the course of March 2020-October 2020 and the impacts on data collection for Project 2



Note: This visualisation of the different stages of lockdown restrictions in the UK in 2020 uses the dates of family-specific significant restrictions recorded by the Health Foundation's COVID-19 Policy Tracker (2021).

Attempts to maximise participant retention, and thereby preserve the sample were made throughout the study. Although, as it was small and participants built a relationship with the researcher through phone calls for the qualitative data collection, attrition from this study was not a significant issue. Participants were asked for preferred contact methods, and both email and phone numbers were kept on record for the duration of the study. A reminder email was also sent to participants to encourage completion of measures if they had not responded within 2 weeks of receiving them.

Project 3. Plans were made for a definitive trial in the event that the pilot phase proved feasible. Preliminary power analyses were conducted in G*Power software (Faul et al., 2007) to determine a sample size based on a predetermined power of .80, a two-tailed alpha of .05, and an anticipated moderate effect size (as this had been found for effects of MBIs on stress reduction in previous research; Spijkerman et al., 2016). These power analyses suggested that a sample size of at least 63 would be required. For the pilot phase, at a similar rate of recruitment to Project 2 (on average 4 parents per month), with similarly very high levels of adherence and low levels of attrition, it was projected that in a best-case scenario, recruitment would take 6 months to achieve at least enough participants to progress to a definitive phase—i.e., at least 4 parents recruited per group each month would have resulted in 12 participants randomised across the whole trial every month, and after 6 months, produced a total of 72 participants. However, given previously reported attrition rates, and the uncertainty of the ongoing pandemic, up to 12 months was allocated to recruitment to account for attrition.

Previously reported attrition rates of between 20-40% have been found in *Headspace* specific research (Howells et al., 2016; Lim et al., 2015), and were used to determine that an

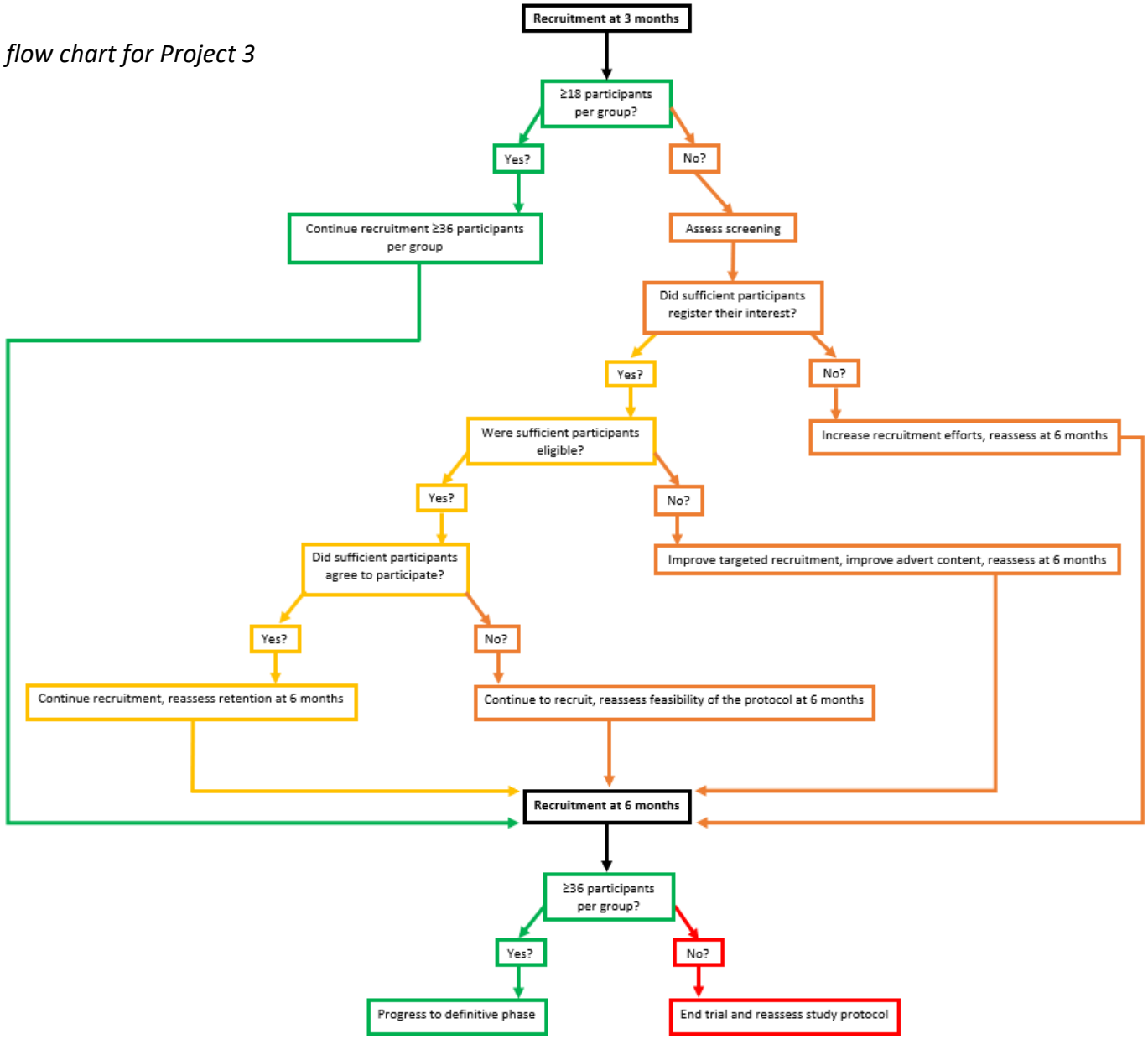
additional 2 participants per group per month would need to be recruited to ensure adequate data for analysis. Recruiting 6 participants per group per month, instead of 4, would provide 36 participants per group over 6 months. With a 40% attrition rate, this would have resulted in 21 retained participants per group, equating to a total sample of 63. If less than half of this number were recruited in 6 months, it was projected to be unlikely to recruit to a total of 63 over the full twelve months. Therefore, if after 6 months, 36 (or more) participants had been randomised to each group, the trial would progress to the definitive phase.

As described above, during the pilot phase, recruitment formed the basis of progression criteria to the definitive phase, informed by the work of the Medical Research Council (MRC) Network of Hubs for Trials Methodology Research (now known as the Trials Methodology Research Partnership; TMRP) as described in Avery et al. (2017). The reporting of internal pilot phases has historically been of variable quality, and difficult to interpret (Arain et al., 2010). Therefore, to improve transparency, the TMRP have made a number of suggestions, of which four were deemed to be particularly relevant to the initial planning stages of this project (the less relevant suggestions included, for example, trial teams consulting their Trial Steering Committees, and pilot recruitment sites being representative of the sites recruiting into the main study). The recommendations most relevant to this pilot study include; a traffic light system for progression rather than a binary stop/go system, pre-specified progression criteria being both ambitious and flexible, recruitment criteria being based on rates per centre per month, and being sure to investigate which elements of recruitment may be causing an issue when participant numbers fall behind projections (Avery et al., 2017). Here, progression criteria were demonstrably flexible because a priori, before recruitment began, it was projected (and pre-registered) that up to double the number of participants (i.e., 216 parents)

would need to be randomised to retain enough participants for planned analyses, however, it very quickly became apparent that this may be unrealistic and recruitment progression criteria were revisited. The revised approach has been visualised here in Figure 2.2, depicting the actual process of progression decisions for Project 3 in a flow chart format.

Figure 2.2

Progression criteria flow chart for Project 3



In the event, significantly greater than anticipated difficulties with recruitment were encountered. Higher than expected attrition rates were also observed—471 participants expressed an interest in the study, but only 64 (14% of those interested) arranged and completed a telephone/video call with the primary researcher, of whom, only 29 (45% of those who completed a call) completed post-intervention measures. Recruitment was stopped after 6 months as it became apparent that adhering to the trial protocol as initially designed was not feasible within the context of post-pandemic changes in family lives, and in light of the resources available to the researcher. Specific details of recruitment and retention are available in Chapter 6, including CONSORT Flow Diagrams (Schulz et al., 2010) of each study stage.

Attempts to preserve the sample were made throughout the data collection period, including incorporating a telephone or video call with participants at the start of the research to develop a relationship with the primary researcher. Participants were also scheduled to receive regular emails including information about the study and reminders to complete measures—details of these are available in Chapter 6. Participants who did not complete baseline measures within three weeks of receiving them were sent two reminder emails, after which they were withdrawn from the study. Participants who received the intervention, but did not complete post-intervention measures within three weeks of receiving them were also sent two reminder emails, after which they were considered to have not completed the study. Participants who withdrew from the study at any stage were excluded from the sample.

2.3.4 Measures

Participants in both Projects 2 and 3 were asked to complete pre-, post-, and follow up online questionnaires, however, these questionnaires were delivered at different time points

and distributed to participants using different data collection software. In Project 2, parents were asked to complete a pre-intervention questionnaire, followed 30 days later by a post-intervention questionnaire, then two weeks later a follow up questionnaire, collected using Qualtrics software (Qualtrics, 2020). In Project 3, parents were asked to complete a pre-intervention questionnaire, followed 40 days later by a post-intervention questionnaire, then three months later a follow up questionnaire, collected using REDCap electronic data capture tools hosted at UCL (Harris et al., 2009, 2019). Further details are available in Chapters 4 and 5 (Project 2), and Chapter 6 (Project 3), however, below is a summary of the included measures, with differences between the two projects highlighted where relevant.

2.3.4.1 Demographics

Participants in both Projects 2 and 3 were asked to provide their age, gender, ethnicity, relationship status, age at the birth of their first child, number of children they had, their relationship to the target child (e.g., birth or adoptive parent), and their child's age, gender and ethnicity. Participants in Project 2 were also asked to provide the age, gender, and ethnicity of any siblings as it was not known what impact *Headspace* may have on children's outcomes, and therefore, all children living in the home were recorded in the data. In qualitative interviews, participants also reported some demographic information, including education level and employment status.

In contrast, in order to focus on the elements of the theoretical model being tested, participants in Project 3 were not asked to record data for siblings, but they were asked to indicate the total number of children (under 18) living with them. As a result of COVID-19 induced changes in working and childcare patterns, participants in Project 3 were also asked about their employment status, the number of hours they worked per week (of which how

many were at home), whether they used childcare services, and if so, the number of hours of childcare outside the home they used each week.

2.3.4.2 Questionnaire data

As a result of the methodological and contextual differences between the two studies—each intended to test *Headspace* with parents in slightly different ways, delivered at different points during the pandemic—the outcome measures used differed slightly between the two projects. As Project 2 was the first of its kind, and was planned prior to the advent of lockdowns, the measures reflect a more exploratory approach to the topic. As Project 3 was planned in light of the learning from Project 2, after COVID-19 restrictions became the norm, an approach more focussed on elucidating the proposed theoretical model's mechanisms of mindfulness described in Chapter 1 was taken (see Figure 1.4). Table 2.1 presents the measures used in both projects with reasons for the differences between the projects. Further details regarding each measure can be found in Chapters 4 and 5 (for Project 2) and Chapter 6 (for Project 3).

Table 2.1

Primary and secondary outcome measures included in Projects 2 and 3

Measure	Scale properties	Subscale	Project 2	Project 3	Cronbach's alpha		Reason for inclusion/removal
Child outcomes					**Project 2**	**Project 3**	
Eyberg Child Behaviour Inventory (ECBI; Eyberg & Pincus, 1999)	• 36 items • 2 sub-scales • 7-point Likert scale • Higher scores = more problem behaviours	Intensity scale	✓	✓	.89	.93	Primary outcome measure – children's externalising problems
Social Competence Scale (SCS; Corrigan, 2002)	• 12 items • 2 sub-scales • 5-point Likert scale • Higher scores = more competence	Prosocial behaviour Emotion regulation	✓	✓	.62 .15	.74 .81	Secondary children's outcome – internalising problems
Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997)	• 25 items • 5 sub-scales • 3-point Likert scale • Higher scores = more difficulties/ strengths	N/a[a]	✓	✗	N/a[a]	-	To streamline the questionnaire to allow for extra measures to test every element of the theoretical model, only one measure for internalizing problems and one for externalizing problems was included

Short-form Children's Sleep Habits Questionnaire (SF-CSHQ; Bonuck et al., 2017)	• 23 items • 6 sub-scales • 3-point Likert scale • Higher scores = more sleep problems	Total scale	✗	✓	-	.89	As a result of parents reporting improvements in their own sleep in Project 2, a children's sleep measure was included to measure (potentially bidirectional) effects on parental sleep quality
Parent outcomes							
Short-form Five Facet Mindfulness Questionnaire (FFMQ-15; Baer et al., 2008)	• 15 items • 5 sub-scales • 5-point Likert scale • Higher scores = more mindfulness	Total scale	✓	✓	.78	.82	A measure of parent's dispositional mindfulness
Short-form Depression, Anxiety, and Stress Scale (DASS-21; Lovibond & Lovibond, 1995)	• 21 items • 3 sub-scales • 4-point Likert scale • Higher scores = more of an issue	Depression Anxiety Stress	✓	✓	.85 .52 .76	.89 .89 .84	A measure of parent's general stress
Emotion Regulation Questionnaire	• 10 items • 2 sub-scales • 7-point Likert scale	Cognitive reappraisal	✓	✓	.84	.80	A measure of parent's emotion regulation

	(ERQ; Gross & John, 2003)	• Higher scores = more use of that strategy	Expressive suppression			.61	.87	
	Pittsburgh Sleep Quality Index (PSQI-9; Buysse et al., 1989)	• 9 components • 1 sub-scale (sleep disturbance) and 1 sleep quality question used • 4-point Likert scale • Higher scores for sleep disturbance = more disturbances • Higher scores for sleep quality = better sleep quality	Sleep disturbance	✗	✓	-	.76	Because sleep improvements were widely noted in semi-structured interviews with parents in Project 2, this scale was included to measure self-reported, subjective sleep quality
Parenting Outcomes								
	Parenting Stress Scale (PSS; Berry & Jones, 1995)	• 18 items • 5-point Likert scale • Higher scores = more stress	Total scale	✓	✓	.90	.91	A measure of parents' stress related specifically to parenting

	Short-form Child Parent Relationship Scale (CPRS; Pianta, 1992)	• 15 items • 2 sub-scales • 5-point Likert scale • Higher scores = more conflict/more closeness	Conflict Closeness	✓	✓	.72 .54	.90 .87	A measure of the parent-child relationship quality
	Parenting Daily Hassles Scale (PDHS; Crnic & Booth, 1991; Crnic & Greenberg, 1990)	• 20 items • 2 sub-scales • 4-point Likert scale • Higher scores = more of an issue	Total intensity	✓	✘	.90	-	Although daily parenting hassles can contribute to parenting stress, to streamline the questionnaire to allow for extra measures to test every element of the theoretical model, only one measure related to parenting stress was included
	Coparent Relationship Scale (CRS; Feinberg et al., 2012)	• 14 items • 7-point Likert scale • Higher scores = better relationship	Brief total scale	✘	✓	-	.65	Because parenting often happens with a co-parent, this was included to measure a potential change in parenting behaviours via improvements in the coparent relationship
	Alabama Parenting Questionnaire for Pre-schoolers (APQ-PR; Clerkin et al., 2007)	• 24 items • 3 sub-scales • 5-point Likert scale • Higher scores = more use of parenting strategy	Positive parenting Inconsistent parenting Harsh parenting	✘	✓	- - -	.79 .70 .29	Included to measure changes in parenting behaviours

Household (dis)organisation (CHAOS; Matheny et al., 1995)	• 6 items • 4-point Likert scale • Higher scores = less organisation	Total scale	✘	✓	-	.63	Included to account for differences in the home environment

[a]Due to an error in the Qualtrics survey, responses for the SDQ in Project 2 were mostly missing as the display logic did not show the scale to participants reliably—this measure was therefore discarded from all analyses due to the lack of data collected, and no psychometric properties were measured in the sample

2.3.4.3 Five-minute speech samples (FMSS)

Five-minute speech samples (FMSS; Gottschalk & Gleser, 1979) are a research procedure whereby caregivers are asked to speak for five minutes uninterrupted about the person in their care, and are most frequently used to assess the expressed emotion of the caregiver (Magaňa-Amato, 1993). In developmental psychology, FMSS are used to measure a caregiver's statements of criticism and positive regard towards a child (Sher-Censor, 2015). In Project 2, FMSS were measured pre- and post- intervention to gain an additional insight into changes in the parent-child relationship that may not have been captured by the questionnaire data. The inclusion of the FMSS is relevant to understanding the parent-child relationship (parenting) facet of the mindful parenting model employed in this thesis. Whilst the pre-post FMSS were included in Project 2 as an exploratory measure to capture the quality of parental expressed emotion towards the target child, it was determined to not be feasible to include at a larger scale in Project 3.

2.3.4.4 Qualitative data – reflexive statement

In addition to pre- post- intervention questionnaire data and FMSS, Project 2 incorporated a semi-structured interview to better understand the experiences of parents regarding the feasibility and acceptability of integrating *Headspace* into their daily lives. Details of the interview schedule used can be found in Appendix E, and more specific details regarding the analysis are reported in Chapter 4. Here, however, an explicit acknowledgement of the epistemological and ontological position of the researcher is warranted. This thesis was approached from within the social constructionist orientation described by Gergen (1985) as encompassing four key assumptions; i) experiences do not, in and of themselves, dictate the terms by which the world is understood—i.e., that scientific theory cannot map reality in a

decontextualised manner; ii) understanding is more usefully situated as a social artifact, whereby knowledge is the product of historically situated exchanges between and among people; iii) the degree to which understanding prevails is not dependent on an external (empirically "valid") perspective, but on the nuances of social context; and iv) that different forms of understanding are negotiated within social life, because knowledge is inextricably connected with the many other activities in which people (both researchers and participants) engage.

Given that this perspective can be positioned in conflict with the positivist-empiricist conception of knowledge more usually associated with the quantitative work undertaken in this thesis (Gergen, 1985), it is important to elucidate that the social constructionist approach taken explicitly for the thematic analysis of the semi-structured interviews has also informed the quantitative data collection in both projects. In Project 2 this was actioned by using an explanatory sequential mixed methods design within a generative approach, argued to be more in line with constructionist thought as it is future focused and accommodates a reality of socially constructed and constantly changing knowledge (Romaioli, 2022). In Project 3, a socially constructed approach to knowledge generation can be seen as results have not been interpreted in terms of truth and validity, but in terms of their implications and consequences for future research as well as the study participants (Romaioli, 2022)—and highlighted by the consistent and rigorous contextualising of all aspects of the research within the specific historical context of this thesis (i.e., COVID-19).

Furthermore, whilst issues of external validity and generalisability are discussed throughout the thesis, these are understood in terms of the contextual shared knowledge between researchers, not as a means to access an objective, universal truth—i.e., that validity and generalisability have meaning when communicating research findings, and therefore are

used with the understanding that this knowledge is socially generated, and meanings are created between people. Therefore, the social constructionist approach taken here, whilst traditionally associated with purely qualitative methods is understood to not preclude more traditionally positivist methods when taken as a philosophical position to socially-situated knowledge generation (McNamee, 2010).

2.3.5 Analytic issues

Project 2. Due to the timing of data collection, it was found that the qualitative data collected in both the semi-structured interviews and FMSS provided a rich insight into family life during a period when the first UK lockdown was beginning to be eased, and immediately after it had been lifted. The quantitative data were also confounded by data collection timing, as parents described both their child's behaviour changing with the rules, and their stress levels changing as a result of being free to access childcare outside of the home once more. As a result, the FMSS data and semi-structured interview data which were rich with detail about the impacts of COVID-19 on family life were thematically analysed and published together to describe the pre- post- changes experienced by parents in order to make a more impactful and timely contribution to the current literature. The qualitative data is also reported separately here to reflect the methodological challenges and decisions associated with analysis. As the quantitative data was used in the planning of Project 3, it is included as a separate report in Chapter 5 and should be interpreted with caution beyond the specific sample measured.

The quantitative data in Chapter 5 which aided in the planning of Project 3 is comprised of two elements; survey data and FMSS data coded for expressed emotion (EE). This data is presented as it would have been presented in a paper if the initial plans for a feasibility study

had not been confounded by COVID-19. It is important to note that whilst in Chapter 4, the FMSS transcripts are thematically analysed in conjunction with the semi-structured interview transcripts, and in Chapter 5, the same data is quantitatively scored for pre-post differences in EE, there is otherwise no overlap of data. The same FMSS data has been presented twice because the two analyses (thematic analysis and EE coding) use different elements of the data which do not overlap; in Chapter 4, the thematic analysis is focused on the experiences of parents related directly to COVID-19 and/or the use of *Headspace*, whereas in Chapter 5, the coding is focused entirely on the quality of emotion expressed about the target child (irrespective of both COVID-19 and *Headspace* use).

Project 3. Initially, per protocol analyses were planned, with secondary intention to treat analyses, however, due to the issues with recruitment and retention resulting in a much smaller sample than intended, the trial did not progress to a definitive phase. Of the 14 participants across the two intervention groups who completed all post-intervention measures, only five participants adhered to the protocol (i.e., used the app for at least 15 days), and thus all participants—irrespective of protocol adherence—were included in preliminary tests for effects. In planning for the definitive phase, missing data for participants who did not complete post-intervention measures were intended to be multiply imputed, however, as the trial was stopped at the internal pilot phase, this was not deemed appropriate. A more appropriate approach for an internal pilot trial was taken, aiming to better understand potential barriers to continued participation which parents who did not complete post-intervention measures may have faced, whereby baseline measures of completers and non-completers were compared. The results were used to explore potential reasons for the feasibility issues seen in recruitment and retention (see Chapter 6 for more details).

CHAPTER 3

Systematic literature review and meta-analysis of mindfulness interventions for parenting stress and child adjustment

3.1 COVID-19 context

The research comprising this thesis started in October 2019, five months before the first COVID-19 lockdown in the UK started at the end of March the following year (Institute for Government, 2022). Project 1, described in this chapter, was conducted in these first 5 months, and was therefore the only element of the three projects comprising this thesis that was unaffected by the pandemic. The initial literature searches were conducted entirely pre-pandemic, in December 2019, and February 2020, meaning that the literature originally incorporated in the meta-analysis was not impacted by the pandemic either. Although these searches were then updated in September 2021, and August 2022, and some additional studies were found, no RCTs investing an MBI with parents measuring parent and/or child outcomes conducted during the pandemic were found.

The additional studies found during the updated searches exclusively reported on studies conducted before the pandemic, and their publication during the pandemic might simply reflect some researchers using lockdowns to write up and publish results using previously gathered data due to the difficulties of collecting new data during periods of social restrictions (Byrom, 2020). There were also significant publishing delays during the 2020-2021 period when searches were first run and updated for this meta-analysis, where academic papers that were not explicitly related to COVID-19 took longer to be published, in part due to the urgency of publishing COVID-19 work, and in part due to reduced editorial capacities

during the pandemic (Forti et al., 2021). Therefore, it is unsurprising that RCTs investigating MBIs to improve parent and/or child outcomes unrelated to the pandemic, were not necessarily a priority for publication and that even by 2022, when the final search update was completed, no RCTs measuring parent and/or child outcomes conducted *after* the pandemic started were found. The result of this is that the literature found and synthesised in this meta-analysis does not reflect the COVID-19 context.

As such, the effects reported in this chapter should be considered in the light of their having been found in a different social climate to that which the studies in this thesis were conducted in, and, going forwards, to the post-COVID-19 climate that future research will be conducted in. Accordingly, the review in Appendix O updates the results in this chapter to account for the effects of COVID-19 by describing the small number of pre-post single-group studies conducted during the pandemic, and narratively synthesises their effects to compare with the results of the meta-analysis described here.

3.2 Abstract

Parenting stress is thought to drive harsh, automatic parenting, increasing the likelihood of children's adjustment problems. While practising mindfulness has been demonstrated to improve emotion regulation and reduce stress, it has only recently been applied to parenting. This review examines in-person and digital mindfulness-based interventions (MBIs) for reducing parenting stress and subsequently improving children's adjustment outcomes, pre-registered on the international prospective register of systematic reviews (PROSPERO; registration number CRD42020177609). The databases PsychInfo, Medline, Pubmed, CINAHL, Web of Science, and the Cochrane Central Register of Controlled Trials were searched for randomised controlled trials investigating MBIs delivered to parents and children targeting parental stress and/or children's adjustment outcomes. Of the 22 eligible studies synthesised, MBIs were moderately effective at reducing parental stress (*g*= -0.36, 95% CI -0.49, -0.23). Small effects were found for children's outcomes (*g* = -0.15, 95% CI -0.29, -0.01). The literature was often at high (41% of included studies) or moderate (59%) risk of bias, and sensitivity analyses indicated a lack of robustness for children's total problems and internalising outcomes. This suggests MBIs are promising for reducing parenting stress and improving children's outcomes, however, caution is warranted due to small samples and poor consideration of control groups. More rigorous RCTs investigating remote delivery, and both parent-only and parallel parent/child interventions are needed.

3.3 Introduction

Mindfulness can be conceptualised as the practice of giving non-judgmental attention to experiences in the present moment (Kabat-Zinn, 2003). As a meta-cognitive skill, it has been demonstrated to improve adults' stress tolerance, emotion regulation and executive control (Zhang et al., 2021). As such, mindfulness has been considered a potentially useful addition to training programmes that aim to improve children's psychological adjustment outcomes by reducing stress and improving coping for parents/caregivers (hereon 'parents'; Bögels et al., 2010). However, there remains a lack of synthesised evidence on the effectiveness of different modes of delivery. Updating and building on a previous systematic review and meta-analysis (Burgdorf et al., 2019), this chapter aims to investigate the effects of MBIs on parental stress and children's psychological adjustment outcomes, specifically considering the impact of delivery mode (i.e., remote and in-person, to parents only or to parents and children in parallel).

3.3.1 Children's adjustment problems and parental stress

Children's adjustment problems span difficulties in both internalising and externalising domains, which are reflected in diverse taxonomies and outcome measures in the literature. Adjustment problems may result in long-term psychological problems (Ogundele, 2018), and are seen to be at least partly driven by harsh, coercive parenting (Patterson, 1982). Harsh parenting (e.g., yelling, smacking) is associated with parental stress, poor emotion regulation, and parent-focused motivations (Lunkenheimer et al., 2017). Mindfulness interventions are hypothesised to target these maladaptive parenting behaviours by inviting the non-judgemental awareness of interactions with the child (Parent et al., 2016), thereby reducing automatic reactions and coercion, and increasing child-focused parenting (Dumas, 2005). By

improving parenting practices, interventions which incorporate mindfulness are theorised to have the potential to reduce child adjustment problems.

3.3.2 Mindfulness-Based Interventions (MBIs)

Mindfulness has been incorporated into several parenting interventions–largely parent-directed, and most often, adaptations of the MBSR programme first developed to manage chronic pain by Kabat-Zinn et al. (1992) (Burgdorf et al., 2019). These MBIs, when delivered to parents, are usually structured according to a standardised framework, delivered by trained practitioners to in-person groups over 8-12 weeks, and include elements of independent skills practice at home (Bögels et al., 2010). MBIs in parenting can be differentiated as those delivered to parents only and those delivered to parents and children in parallel. This distinction is important because, although most of the literature investigates parent-only interventions, there is mixed evidence regarding which delivery route is more effective at improving parent-child relationships and, in turn, children's adjustment (Burgdorf et al., 2019; Morrison et al., 2014).

3.3.3 Mode of delivery

Building on a prior review which focused exclusively on MBIs delivered in-person (Burgdorf et al., 2019), here, MBIs delivered remotely are also included. Barriers to in-person interventions can include a variety of systemic and individual factors relating to families themselves, as well as limited financial resources and varying capacities of services (Department for Communities and Local Government, 2012; Koerting et al., 2013). These barriers are seen to disproportionately affect parents in greater need of support—particularly those of lower socio-economic status (SES) who are simultaneously at greater risk of employing harsh parenting practices (Morris et al., 2017). Remote delivery of psychological

interventions usually occurs at the individual (as opposed to group) level and has grown in popularity over the last decade (Bakker et al., 2016). In particular, remotely delivered (usually self-directed) MBIs have shown promise in their efficacy, accessibility, and personalisation (Mrazek et al., 2019; Taylor et al., 2021).

3.3.4 The current study

Synthesising the existing literature, the current chapter investigates the effects of mindfulness interventions delivered both remotely and in-person to either parents only or to parents and children in parallel, at the individual level or in group format, for the purposes of improving parental stress and/or children's adjustment outcomes. Only data from RCTs have been included in this review to facilitate robust quantitative analysis. Children's adjustment outcomes were not restricted, although prior literature has demonstrated more pronounced effects for externalising problems than internalising problems (Burgdorf et al., 2019). In summary, this meta-analysis aims to answer the research questions:

1. What are the quantitative effects of MBIs on measures of parental stress and child adjustment outcomes?
2. Are there any differences in the effects of MBIs on parental stress and child adjustment outcomes when comparing interventions delivered to parents only to parents and children in parallel?
3. Are there any differences in the effects of MBIs on parental stress and child adjustment outcomes when comparing interventions delivered remotely to those delivered in-person?
4. If effects are found, are these effects robust to sensitivity analysis?

3.4 Methods

3.4.1 Eligibility criteria

Studies were included if they randomly allocated participants to evaluate MBIs delivered to parents only or parents and children in parallel, in clinical or non-clinical populations, with a control group, including quantitative outcome measures of parental stress and/or child (≤18 years) adjustment (here understood to mean internalising/externalising problems). Mindfulness interventions were defined as comprising more than one session, delivered remotely or in-person, incorporating at least 50% mindfulness content, and referencing further independent practice. Control groups included waitlist, alternative parent-training, other forms of treatment as usual, and no intervention. No limitation was placed on the country of origin, but reports not in English were excluded, as there was no scope for translation (see Figure 3.1 for a PRISMA flow diagram representing excluded studies). Due to the relative lack of RCTs investigating MBIs delivered to parents (most of the literature is comprised of single-group, pre-post, pilot studies; Burgdorf et al., 2019), results were not restricted to published research, but also included unpublished doctoral theses.

3.4.2 Information sources

The electronic databases PsychInfo, Medline, Pubmed, CINAHL, Web of Science, and the Cochrane Central Register of Controlled Trials were originally searched between December 2019 and February 2020, and searched for updates in September 2021, and August 2022. Reference lists of all eligible studies, as well as previous systematic reviews (Burgdorf et al., 2019; Cachia et al., 2016; Townshend et al., 2016), were also searched manually. Searches were re-run prior to final data extraction; no additional studies were found.

3.4.3 Search

The search strategy was developed in collaboration with the specialist psychology librarian at Goldsmiths, University of London. In an initial meeting, key terms were identified using the PICO (Population, Intervention, Comparison, Outcome) framework, as recommended by the Cochrane Collaboration (Thomas et al., 2022). Using this framework, parents and their children were identified as the population of interest, mindfulness as the intervention, and comparisons of interest as no treatment, treatment as usual, and alternative parent-training. Outcomes of interest were broadly identified to be parent and child wellbeing, although on completing initial trial searches in the key databases suggested by the specialist librarian (PsychInfo, Medline, Pubmed, CINAHL, Web of Science, and the Cochrane Central Register of Controlled Trials), it was determined that including the outcomes of interest as part of the search strategy in fact only served to overly compromise the sensitivity of results, and was therefore dropped from the final strategy.

After an iterative process of test searching, the key terms were refined, and related subject headings were identified using the various databases' thesaurus functions. This process resulted in the identification of two key terms—"mindfulness" and "parenting"—which are available with the relevant truncation and related subject headings in Table 3.1. All variations of keywords and subject headings were combined using the Boolean operator OR, and then the two searches were combined with the Boolean operator AND. In Medline, the equivalent MeSH terms were used in place of subject headings. Truncation was used to replace the suffixes of words where multiple suffixes were relevant.

Table 3.1

Key search terms

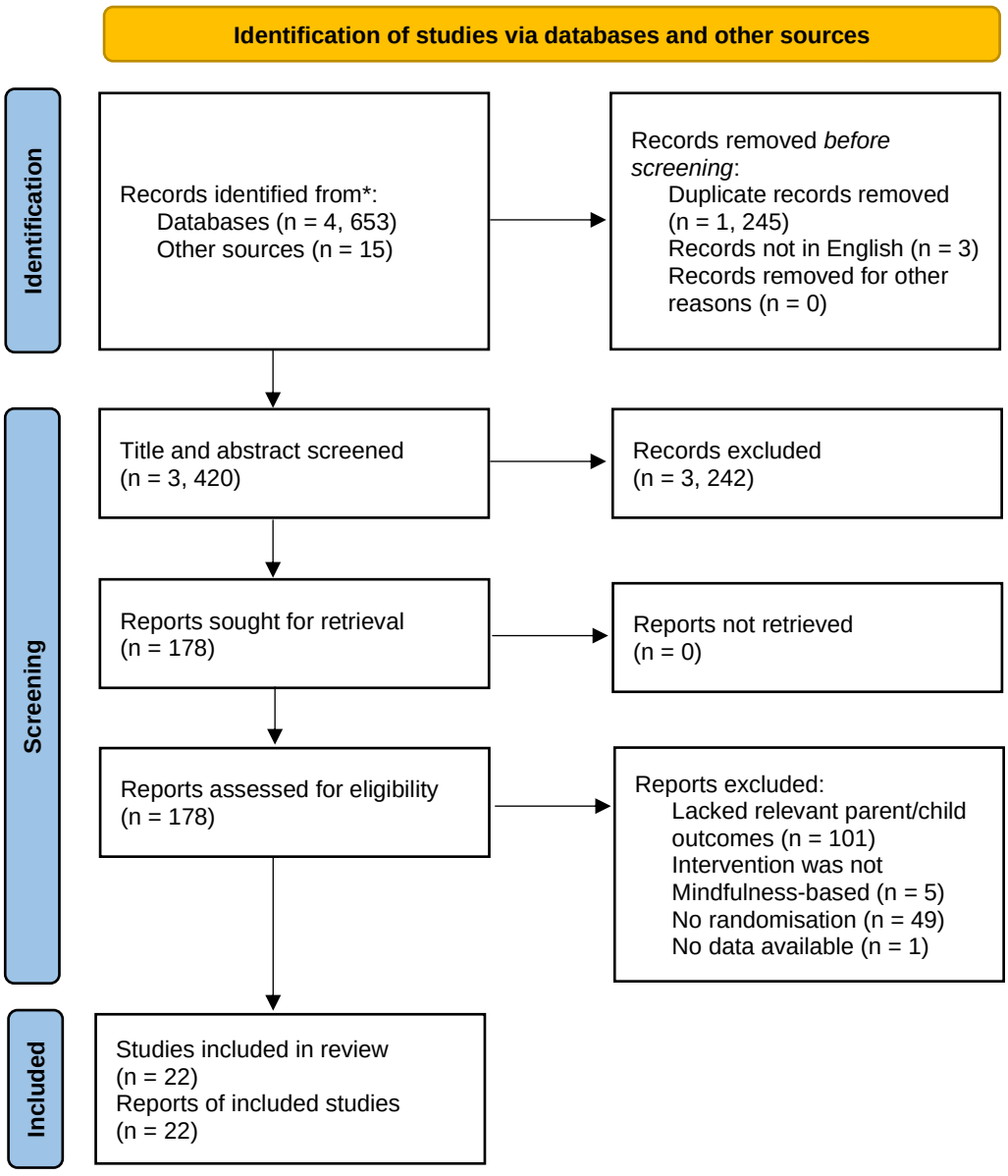
Key term	Keyword search terms	Subject heading search terms
Mindfulness	Mindful*	Mindfulness
	Meditat*	Meditation
	Mindful parent*	
	Dispositional mindfulness	
	Trait mindfulness	
Parenting	Parent*	Parenting
	Mother*	Parents
	Father*	Parenting style
	Maternal	Parenting skills
	Paternal	Parental attitudes
		Parenting behaviour
		Parent training
		Parent-child relations
		Mother-child relations
		Father-child relations

3.4.4 Study selection

Following the removal of duplicates, and papers utilising the same dataset with the same outcomes, title and abstract screening resulted in 178 studies included in a full-text review. Of these, 101 were excluded as lacking relevant outcomes, five due to the intervention not fitting the specified 'mindfulness-based' criteria, and a further 49 as they either did not randomly allocate participants, or were observational studies only. Three published articles were excluded as the main text was not in English, and one was excluded because relevant data were not available after contacting the author. Therefore, in total 22 studies were synthesised; Figure 3.1 presents a flow chart representing this process.

Figure 3.1

PRISMA 2020 Flow diagram for new systematic reviews which included searches of databases and other sources



Adapted from: Page et al. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. International journal of surgery, 88, 105906.

3.4.5 Risk of bias

Risk of bias assessments were conducted using the Cochrane Risk of Bias 2 tool for RCTs (RoB 2; Sterne et al., 2019). All domains were assessed, but to reserve sample size, studies having a moderate (n = 13) or high (n = 9) risk of bias were not excluded but rather findings were reported with this in mind. See Table 3.2 for details.

To ensure robustness in the review process, a third party who was not otherwise involved in any elements of the research comprising this thesis independently searched and extracted the data from the papers of interest, and conducted separate risk of bias assessments. Comparison of the results of this replication suggested some initial differences of opinion for the risk of bias for Behbahani et al. (2018) and Lo et al. (2017). These were resolved through discussion. Specifically, the source of the difference of opinion was that the independent assessor had initially considered scoring Behbahani et al. (2018) as at high risk of bias due to the high risk for incomplete outcome data (the analyses did not follow intention to treat principles), and Lo et al. (2017) as at high risk of bias due to the lack of allocation concealment, as the randomisation table allowed the researchers to see what condition new incoming parents would be allocated to. However, it was agreed that as these risks generally pertained to one sub-criterion, not the overall criterion, that therefore both studies remained at moderate risk of bias.

Table 3.2

Risk of bias assessments using the RoB 2 Tool

Included studies	Overall risk of bias
Behbahani et al. (2018)	Moderate
Brown et al. (2021)	Moderate
Chan & Neece (2018)	Moderate
Chaplin et al. (2021)	High
Ferraioli & Harris (2013)	High
Guo et al. (2020)	Moderate
Ho et al. (2021)	Moderate
Jespersen et al. (2021)	High
Liu et al. (2021)	Moderate
Lo et al. (2017)	Moderate
Lo et al. (2019)	Moderate
Lo et al. (2020)	Moderate
Mah et al. (2021)	High
Mann et al. (2016)	High
McGregor et al. (2020)	High
Muratori et al. (2021)	High
Padgett (2020)	High
Potharst et al. (2019)	Moderate
Schwartzman et al. (2021)	Moderate
Siebelink et al. (2021)	Moderate
Valero et al. (2021)	High
Weitlauf et al. (2020)	Moderate

3.4.6 Data extraction

Data extracted included the number of participants, participant characteristics (gender, psychopathology, child age) (see Table 3.3), study design, and intervention details (see Table 3.4). For the meta-analysis, post-intervention means, standard deviations and number of participants were extracted for both the intervention and control groups. Too few studies reported follow-up data for both parenting and child outcomes to include follow-up time points in analyses. Where data were missing, study authors were contacted for additional details. If no reply was received within two months of contact, the study was excluded. Data were also independently extracted and checked for agreement with colleagues external to UCL, the University of Sussex, and who were not otherwise involved in the project.

3.4.7 Analytic strategy

The included studies showed a high convergence of measures used for the parent outcomes: the Parental Stress Index (PSI; Abidin, 1995) was used in 13 of the 19 studies where this was measured. However, there was significant heterogeneity in the children's outcomes, including: the Child Behaviour Checklist (CBCL; Achenbach, 1991) in eight studies, the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) used in three, the Eyberg Child Behaviour Inventory (ECBI; Eyberg & Pincus, 1999) used in one (Lo et al., 2017), and various attention-deficit/hyperactivity disorder (ADHD) or autism spectrum disorder (ASD) specific measures used in the others (see Table 3.4).

For both parent and child outcomes, composites had to be calculated for some papers due to differential reporting of total scores or sub-scale scores. For parent outcomes, most studies (n = 16) reported a total parenting stress score, however, Chaplin et al. (2021) reported separate data for the three subscales of the Stress Index for Parents of Adolescents

(SIPA; Sheras et al., 1998), Mah et al. (2021) reported separate data for two of the PSI subscales, and Potharst et al. (2019) reported separate data for the three subscales of the PSI. A single composite effect size was created for all three of these studies, using the method described by Borenstein et al. (2009) to avoid giving additional weight to these studies by including the subscales separately as if independent from each other. Effects for these subscales were thus averaged, and the corresponding variance was calculated using a correlation between them of $r = 0.55$ for the SIPA, and $r = 0.60$ for the PSI as described by Burgdorf et al. (2019).

For children's outcomes, due to the heterogeneity of measures used, it was not possible to examine each quantitatively, therefore, outcomes were grouped within studies into the domains of internalising or externalising problems. Following Burgdorf et al.'s (2019) methods, a "total problems" score was also used. This was done by incorporating studies where total scale scores, and broadband scale scores (e.g., McGregor et al. (2020) reported only CBCL Internalising scores) were incorporated as they were, and for those where no broadband scale was used, but multiple outcomes were reported, a composite parent-report effect size was calculated using the Borenstein et al. (2009) method described above, assuming a correlation of $r = 0.60$ between outcomes within each study, as per Burgdorf et al. (2019). For the internalising and externalising subgroup analyses, broadband scales were used where reported, but if not reported, subscales coded as relevant to either internalising or externalising problems were combined to form relevant composite effects. One study (Potharst et al., 2019) reported data from participating mothers and their non-participating partners—data was used for the participating mothers only, to avoid issues of non-independence.

The meta-analysis was conducted in Review Manager 5.3 (Cochrane Collaboration, 2014). Standardised mean differences (SMDs) were calculated, then imputed into a random-effects meta-analysis, using Hedge's *g* method. SMDs were classified as large if greater than 0.8, moderate if around 0.5, and small if around 0.2 or lower (Cohen, 1992). Heterogeneity was assessed used I^2 and χ^2 statistics—I^2 values of 25% suggest low heterogeneity, 50% moderate, and 75% high (Higgins & Thompson, 2002). Outliers were defined as where 95% confidence intervals (CI) did not overlap with those of the pooled effect CI (Harrer et al., 2019), and were removed. Sensitivity analyses, available in Tables 3.5 to 3.8), used the leave-one-out method to determine bias from one or more high-weighted studies (Greenhouse & Iyengar, 2009).

Subgroup analyses were conducted to determine differential effects on internalising or externalising problems, as well as the effects of intervention delivery method, combining parent-child parallel interventions (Lo et al., 2019, 2020) separately from those delivered to parents only, and interventions delivered remotely (Brown et al., 2021; Potharst et al., 2019) separately from those delivered in-person. Subgroup analyses of delivery methods were only possible for parenting stress, children's total problems and children's externalising problems analyses due to the small number of studies available measuring internalising problems and utilising, respectively, parallel and/or remote delivery methods.

3.5 Results

3.5.1 Study characteristics

The majority of studies (n = 13, 59%) delivered in-person group-format mindfulness programmes based on MBCT and/or MBSR, to parents only. Six studies (27%) delivered mindfulness in-person to both parents and children, in parallel (Ho et al., 2021; Lo et al., 2019,

2020; Muratori et al., 2021; Siebelink et al., 2021; Valero et al., 2021), and three studies (14%) utilised remote delivery methods to parents only (Guo et al., 2020; Padgett, 2020; Potharst et al., 2019). Intervention duration ranged from one to three hours a week, for between four to eight weeks. Total intervention duration ranged from four and a half to 24 hours (M = 12.5 hours). Child-age range was similarly heterogenous (0-18 years). Only seven papers reported the specific amount of time participants were invited to do home practice for during the study. This ranged from 10 to 45 minutes per day for parents (M = 24 minutes) and from 10 to 15 minutes for children (M = 12.5 minutes).

A total of 1, 897 parents participated in the included studies, of whom the majority were women (ranging from 61% to 100%, M = 87.25%), and married (ranging from 61% to 100%, M = 84.72%). The mean age of parents (where reported) was 38.5 years (ranging from 30 to 47). Where reported, the majority of children were male (ranging from 43% to 100%, M = 70.5%) and neurodiverse, with 17 of the 22 studies (77%) investigating neurodivergent children specifically. Of those 17 studies, seven focussed on ADHD, nine on ASD, and one did not specify the developmental disorder. Of the eight studies that reported parental ethnicity, six had a majority of White participants (ranging from 33% to 89%, M = 68%), one had a majority BAME sample (55%; Schwartzman et al., 2021), and one included a large proportion of Latinx participants (48%; Chan & Neece, 2018). Of the 16 studies which reported parental SES, the majority (n = 12, 52%) included participants of moderate to high SES, with only four studies specifically investigating parents and children with low SES (Brown et al., 2021; Chan & Neece, 2018; Jespersen et al., 2021; Lo et al., 2019).

For more details on the study characteristics, see Tables 3.3 and 3.4.

Table 3.3

Summary of included participant characteristics

	Parent demographics							Child demographics		
Study	**Sample size**	**Age (years) M (SD)**	**Gender (Female) N (%)**	**Clinical status**	**Married or Cohabiting (%)**	**SES***	**Majority ethnicity N (%)**	**Gender (Male) N (%)**	**Age range (M, SD)**	**Clinical status (Diagnosis)**
Behbahani et al. (2018)	56	NR	56 (100%)	None	NR	NR	White, 36 (64%)	37 (66%)	7-12	ADHD
Brown et al. (2021)	28	31 (9.1)	23 (82%)	Substance Use Disorder	NR	Low	Latinx, 38 (48%)	17 (60.7%)	0-16	NR
Chan & Neece (2018)	80	37.21 (7.22)	77 (96.3%)	None	60 (75%)	Low	White, 52 (65%)	57 (71.25%)	2.5-5	ASD
Chaplin et al. (2021)	83	47.4 (6.3)	78 (94%)	None	66 (79.8%)	High	White, 27 (33%)	40 (48%)	12-17	Yes (not specified)
Ferraioli & Harris (2013)	15	NR	10 (67%)	None	15 (100%)	High	NR	NR	3-18	ASD
Guo et al. (2020)	284	30.6 (6.2)	284 (100%)	Anxiety & Depression	145 (92.36%)	High	NR	NA	NA	NA
Ho et al. (2021)	37	46.5 (6.0)	28 (76%)	None	33 (89%)	High	White, 24 (66%)	(76%)	10-18	ASD
Jespersen et al. (2021)	213	30 (NR)	130 (61%)	None	130 (61%)	Low	NR	(60%)	0-5	None

Liu et al. (2021)	113	39.76 (4.62)	102 (90%)	None	106 (94%)	High	NR	87 (77%)	M 10 (SD 2.48)	ADHD
Lo et al. (2017)	180	38.87 (5.92)	169 (93.9%)	None	165 (92%)	NR	NR	139 (77%)	5.24 (NR)	ASD
Lo et al. (2019)	102	38.20 (7.60)	95 (93.1%)	None	84 (82%)	Low	NR	57 (56%)	5-7	None
Lo et al. (2020)	100	39.21 (NR)	88 (88%)	None	91 (91%)	NR	NR	83 (83%)	5-7	ADHD
Mah et al. (2021)	63	41 (7.4)	59 (94.1%)	None	52 (83%)	High	White, 45 (72%)	(73.5%)	6-11	ADHD
Mann et al. (2016)	38	37.1 (5.3)	36 (95%)	History of Depression	27 (71%)	NR	NR	NR	2-6	None
McGregor et al. (2020)	80	37.71 (8.38)	NR	None	60 (75%)	Middle	NR	(66.7%)	M 4.01 (SD 0.94)	ASD
Muratori et al. (2021)	74	NR	50 (68%)	None	NR	Middle	NR	80 (100%)	8-12	ADHD
Padgett (2020)	56	39.03 (6.48)	53 (94%)	None	51 (91%)	High	White, 48 (86%)	NR	M 7.90 (SD 2.05)	ASD
Potharst et al. (2019)	67	35.8 (3.6)	67 (100%)	None	66 (99%)	NR	NR	29 (43%)	3-4	None
Schwartzman et al. (2021)	34	40.6 (NR)	26 (76%)	None	26 (76.8%)	High	BAME, 19 (55%)	28 (82.4%)	4-10	ASD
Siebelink et al. (2021)	103	43.4 (5.9)	70 (68%)	None	80 (78%)	High	NR	72 (70%)	8-16	ADHD
Valero et al. (2021)	30	44.6 (5.1)	29 (97%)	None	27 (90%)	NR	NR	23 (77%)	9-14	ADHD
Weitlauf et al. (2020)	61	33.27 (6.24)	53 (87%)	None	NR	High	White, 54 (89%)	50 (82%)	M 2.30 (SD 0.45)	ASD

Notes: NR = Not reported; *where SES is reported as high, middle, or low in the paper, it has been reported as such here, where it has been reported as annual income in the original paper, it has been sorted into high, middle, or low, according to the applicable country's median income.

Table 3.4

Summary of included study characteristics

	Intervention details						Child outcomes	
Study	**Intervention format**	**Delivery method**	**Duration (hours per week)**	**Attendance (%)**	**Control group**	**Parenting stress measure**	**Measures**	**Composites created**
Behbahani et al. (2018)	Parents	In-person	8 weeks (1.5 hr)	NR	NR	PSI-SF	SNAP-IV	None
Brown et al. (2021)	Parents	In-person	6 weeks (1 hr)	84%	Waitlist	PSI-SF	CBCL	None
Chan & Neece (2018)	Parents	In-person	8 weeks (2 hr)	NR	Waitlist	SIPA	CBCL	Total Problems; Internalising; Externalising
Chaplin et al. (2021)	Parents	In-person	8 weeks (2 hr)	78.3%	Education	PSI	NA	NA
Ferraioli & Harris (2013)	Parents	In-person	8 weeks (NR)	97.80%	Parent Training	PSI	NA	NA
Guo et al. (2020)	Parents	Remote	6 weeks (1.5 hr)	91.80%	Waitlist	PSI	NA	NA
Ho et al. (2021)	Parent & Child	In-person	9 weeks (1.5 hr)	78.9%	Waitlist	PSI	CBCL; BRIEF; SRS	Total Problems; Externalising
Jespersen et al. (2021)	Parents	In-person	4 weeks	NR	Waitlist	PPS	SDQ	Externalising

			(2 hr)					
Liu et al. (2021)	Parents	In-person	8 weeks (3 hr)	81%	TAU	PSI-SF	CPRS; ADHD-IV	Total Problems; Externalising
Lo et al. (2017)	Parents	In-person	6 weeks (1.5 hr)	83.3%	Control	PSI-SF	ECBI	None
Lo et al. (2019)	Parents & Child	In-person	6 weeks (1.5 hr)	84%	Waitlist	PSI-SF	CBCL	NA*
Lo et al. (2020)	Parents & Child	In-person	6 weeks (1.5 hr)	79%	Waitlist	PSI-SF	SWAN; CBCL	NA*
Mah et al. (2021)	Parents	In-person	12 weeks (2 hr)	NR	Parent Training	PSI-SF	ADHD-IV	None
Mann et al. (2016)	Parents	In-person	8 weeks (NR)	74%	TAU	PSI-SF	SDQ	None
McGregor et al. (2020)	Parents	In-person	8 weeks (2 hr)	NR	Waitlist	NA	CBCL	None
Muratori et al. (2021)	Parents & Child	In-person	9 weeks (1.5 hr)	85%	Waitlist	NA	SDQ	Externalising
Padgett (2020)	Parents	Remote	6 weeks (1 hr)	34%	Waitlist	PSS	NA	NA
Potharst et al. (2019)	Parents	Remote	8 weeks (35-50 min)	NR	Waitlist	PSQ	CBCL	Total Problems

Schwartzman et al. (2021)	Parents	In-person	8 weeks (1.5 hr)	47%	Delayed Treatment	PSI-SF	SDQ; ABC; SRS	Total Problems; Internalising; Externalising
Siebelink et al. (2021)	Parents & Child	In-person	8 weeks (1.5 hr)	91%	TAU	NA	CPRS; KIDSCREEN-10; BRIEF; SWAN	Total Problems; Internalising; Externalising
Valero et al. (2021)	Parents & Child	In-person	8 weeks (1.5 hr)	NR	Waitlist	PSI-SF	Conner's	Total Problems; Externalising
Weitlauf et al. (2020)	Parents	In-person	18 weeks (1.5 hrs)	NR	Parent Training	PSI-SF	CBCL	None

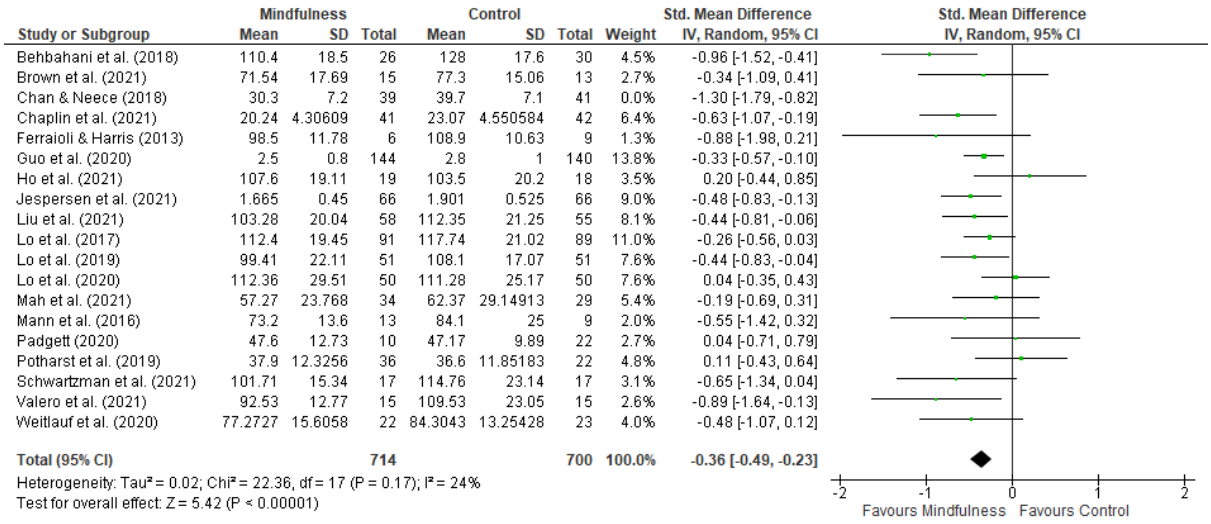
Notes: NR = Not reported; NA = Not Applicable; TAU = Treatment as Usual; * = data not available in paper or from authors; PSI-SF = Parental Stress Index – Short Form; PSS = Parental Stress Scale; SDQ = Strengths and Difficulties Questionnaire; ECBI = Eyberg Child Behaviour Inventory; CBCL = Child Behaviour Checklist; SRS = Social Responsiveness Scale; ABC = Autism Behaviour Checklist; BRIEF = Behaviour Rating Inventory of Executive Function; SNAP-IV = Swan, Nolan, and Pelham Questionnaire (ADHD Scale); SWAN = ADHD measure; CPRS = Conner's Parent Rating Scale (ADHD measure); Conner's = ADHD measure

3.5.2 Effects of mindfulness interventions on parental stress

Data were synthesised in a random effects meta-analysis for parental stress at post-intervention from 1, 494 parents (753 randomised to receive mindfulness). At post-intervention, parents in the mindfulness intervention arms reported lower parental stress compared to controls, with a moderate effect size (g = -0.42, 95% CI -0.58, -0.26, p < 0.01, k = 19). There was also moderate statistical heterogeneity (I^2 = 51%, χ^2 = 36.46, df = 18, p = 0.006). One outlier was identified (Chan & Neece, 2018); its removal from the analysis decreased heterogeneity (I^2 = 24%, χ^2 = 22.36, df = 17, p = 0.17), and effect size (g = -0.36, 95% CI -0.49, -0.23, p = < 0.001, k = 18). The results after outlier removal are displayed in Figure 3.2.

Figure 3.2

Forest plot depicting post-intervention parenting stress measures for mindfulness intervention and control groups with outlier removed



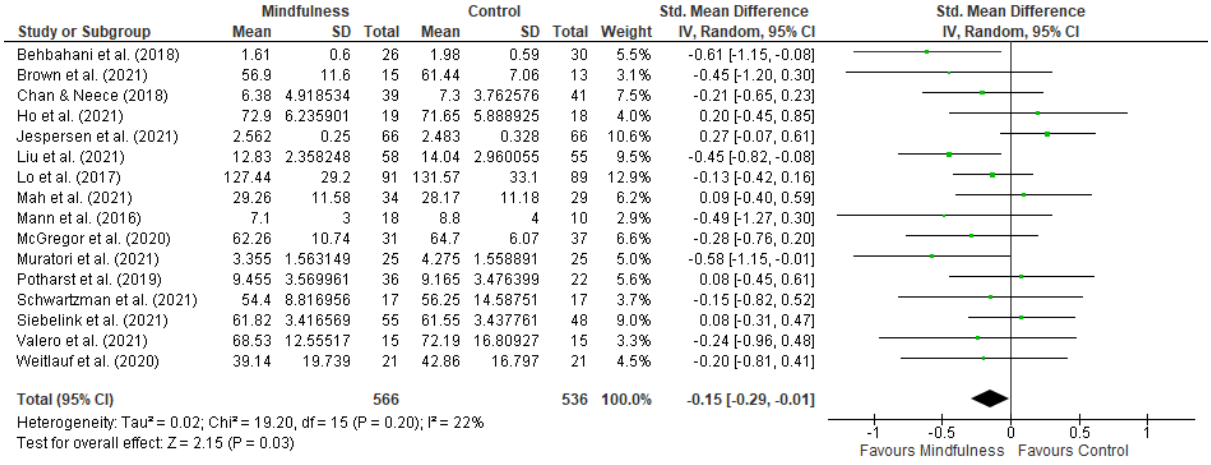
3.5.3 Effects of mindfulness interventions on children's outcomes

The random-effects meta-analysis results for the parent-reported child total problems outcome are shown in Figure 3.3; data were synthesised from 1, 102 parents, 566 randomised

to receive an intervention. Comparison with controls revealed significant small post-intervention effects on children's total problems (g = -0.15, 95% CI = -0.29, -0.01, p = 0.03, K = 16), and moderate statistical heterogeneity was found (I^2 = 22% χ^2 = 19.20, df = 15, p = 0.20). No outliers were identified.

Figure 3.3

Forest plot depicting post-intervention measures of children's total problems for mindfulness intervention and control groups



Study or Subgroup	Mindfulness Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Behbahani et al. (2018)	1.61	0.6	26	1.98	0.59	30	5.5%	-0.61 [-1.15, -0.08]
Brown et al. (2021)	56.9	11.6	15	61.44	7.06	13	3.1%	-0.45 [-1.20, 0.30]
Chan & Neece (2018)	6.38	4.918534	39	7.3	3.762576	41	7.5%	-0.21 [-0.65, 0.23]
Ho et al. (2021)	72.9	6.235901	19	71.65	5.888925	18	4.0%	0.20 [-0.45, 0.85]
Jespersen et al. (2021)	2.562	0.25	66	2.483	0.328	66	10.6%	0.27 [-0.07, 0.61]
Liu et al. (2021)	12.83	2.358248	58	14.04	2.960055	55	9.5%	-0.45 [-0.82, -0.08]
Lo et al. (2017)	127.44	29.2	91	131.57	33.1	89	12.9%	-0.13 [-0.42, 0.16]
Mah et al. (2021)	29.26	11.58	34	28.17	11.18	29	6.2%	0.09 [-0.40, 0.59]
Mann et al. (2016)	7.1	3	18	8.8	4	10	2.9%	-0.49 [-1.27, 0.30]
McGregor et al. (2020)	62.26	10.74	31	64.7	6.07	37	6.6%	-0.28 [-0.76, 0.20]
Muratori et al. (2021)	3.355	1.563149	25	4.275	1.558891	25	5.0%	-0.58 [-1.15, -0.01]
Potharst et al. (2019)	9.455	3.569961	36	9.165	3.476399	22	5.6%	0.08 [-0.45, 0.61]
Schwartzman et al. (2021)	54.4	8.816956	17	56.25	14.58751	17	3.7%	-0.15 [-0.82, 0.52]
Siebelink et al. (2021)	61.82	3.416569	55	61.55	3.437761	48	9.0%	0.08 [-0.31, 0.47]
Valero et al. (2021)	68.53	12.55517	15	72.19	16.80927	15	3.3%	-0.24 [-0.96, 0.48]
Weitlauf et al. (2020)	39.14	19.739	21	42.86	16.797	21	4.5%	-0.20 [-0.81, 0.41]
Total (95% CI)			**566**			**536**	**100.0%**	**-0.15 [-0.29, -0.01]**

Heterogeneity: Tau² = 0.02; Chi² = 19.20, df = 15 (P = 0.20); I² = 22%
Test for overall effect: Z = 2.15 (P = 0.03)

3.5.4 Subgroup analyses

3.5.4.1 Children's internalising and externalising problems

When delineated by externalising and internalising problems, the results for children's outcomes remained statistically significant. Specifically, a small effect on externalising problems was found (g = -0.24, 95% CI = -0.38, -0.10, p < 0.001, k = 11), with minimal statistical heterogeneity (I^2 = 7%, χ^2 = 10.73, df = 10, p = 0.38), and on internalising problems (g = -0.34, 95% CI = -0.62, -0.06, p = 0.02, k = 4), with moderate statistical heterogeneity (I^2 = 27%, χ^2 = 4.11, df = 3, p = 0.25).

3.5.4.2 Parent only and parallel (parent and child) interventions

A moderate intervention effect for parenting stress was found in the parent-only delivery group *(g* = -0.39, 95% CI = -0.51, -0.23, $p < 0.001$, k = 14) with minimal statistical heterogeneity (I^2 = 2%, χ^2 = 13.29, df = 13, p = 0.43), and a small effect for the children's externalising problems outcome (g = -0.23, 95% CI = -0.41, -0.06, p = 0.01, k = 7) with minimal statistical heterogeneity (I^2 = 21%, χ^2 = 7.58, df = 6, p = 0.27). No effect for children's total problems was found, and there were too few studies measuring effects on internalising problems using parallel delivery methods to be included in this subgroup analysis.

No effect for parents' outcomes were found in the parallel delivery group, however, a small, statistically significant effect was found for children's externalising problems (g = -0.28, 95% CI = -0.55, -0.00, p = 0.05, k = 4) with minimal statistical heterogeneity (I^2 = 2%, χ^2 = 3.06, df = 3, p = 0.38). There were no differences between subgroups when comparing parent-only delivery and parallel parent-child delivery methods for parenting stress (χ^2 = 0.48, df = 1, p = 0.49, I^2 = 0%), children's total problems (χ^2 = 0.06, df = 1, p = 0.80, I^2 = 0%), or children's externalising problems (χ^2 = 0.21, df = 1, p = 0.64, I^2 = 0%).

3.5.4.3 In-person and remote interventions

A moderate effect for parental stress was found for interventions delivered in-person (g = -0.40, 95% CI = -0.55, -0.26, $p < 0.001$, k = 15), with minimal statistical heterogeneity (I^2 = 22%, χ^2 = 18.00, df = 14, p = 0.21), however, no effects were found for interventions delivered remotely (g = -0.18, 95% CI = -0.47, 0.12, $p < 0.25$, k = 3), and no differences between the subgroups were found (χ^2 = 1.84, df = 1, p = 0.17, I^2 = 45.7%). This is likely reflective of power issues, as only three studies utilising remote delivery methods (Guo et al., 2020; Padgett, 2020; Potharst et al., 2019), all at moderate to high risk of bias, were analysed. Furthermore,

there were too few studies which measured any children's outcomes whilst utilising a remote delivery method to include in this analysis.

3.5.5 Sensitivity analysis

Parent outcomes (Table 3.5) and children's externalising outcomes (Table 3.6) were robust to sensitivity analyses. However, for children's total problems (Table 3.7), removing Behbahani et al. (2018), Liu et al. (2021), and Muratori et al. (2021) rendered the overall effect non-significant as CIs crossed zero. For children's internalising outcomes (Table 3.8), removing McGregor et al. (2020) and Siebelink et al. (2021) had the same effect.

Table 3.5

Results of sensitivity analyses for parental stress outcome

	Parental stress outcome								
Study removed	**Total (N)**	**Intervention group (N)**	**SMD**	**95% CI**	**Overall Effect P-value**	**I^2 (%)**	**χ^2**	**df**	**Heterogeneity P-value**
Behbahani et al. 2018	1438	727	-0.39	-0.55, -0.23	< 0.001	47	32.31	17	0.01
Brown et al. 2021	1466	738	-0.42	-0.59, -0.26	< 0.001	53	36.43	17	0.004
Chan & Neece 2018	1414	714	-0.36	-0.49, -0.23	< 0.001	24	22.36	17	0.17
Chaplin et al. 2021	1411	712	-0.40	-0.57, -0.24	< 0.001	52	35.28	17	0.006
Ferraioli & Harris 2013	1479	747	-0.41	-0.57, -0.25	< 0.001	52	35.69	17	0.005
Guo et al. 2020	1210	609	-0.43	-0.61, -0.25	< 0.001	53	36.10	17	0.004
Ho et al. 2021	1457	734	-0.44	-0.60, -0.28	< 0.001	49	33.07	17	0.01
Jespersen et al. 2021	1362	687	-0.42	-0.59, -0.24	< 0.001	53	36.20	17	0.004
Liu et al. 2021	1381	695	-0.42	-0.59, -0.25	< 0.001	53	36.40	17	0.004
Lo et al. 2017	1314	662	-0.43	-0.61, -0.26	< 0.001	52	35.57	17	0.005
Lo et al. 2019	1392	702	-0.42	-0.59, -0.25	< 0.001	53	36.41	17	0.004
Lo et al. 2020	1394	703	-0.45	-0.61, -0.29	< 0.001	46	31.40	17	0.02
Mah et al. 2021	1431	719	-0.43	-0.60, -0.27	< 0.001	52	35.78	17	0.005
Mann et al. 2016	1472	740	-0.42	-0.58, -0.25	< 0.001	53	36.33	17	0.004
Padgett 2020	1462	743	-0.43	-0.60, -0.27	< 0.001	52	35.14	17	0.006
Potharst et al. 2019	1436	717	-0.45	-0.61, -0.29	< 0.001	48	32.91	17	0.01
Schwartzman et al. 2021	1460	736	-0.41	-0.58, -0.25	< 0.001	53	35.93	17	0.005
Valero et al. 2021	1464	738	-0.40	-0.56, -0.24	< 0.001	51	34.79	17	0.007
Weitlauf et al. 2020	1449	731	-0.42	-0.58, -0.25	< 0.001	53	36.38	17	0.004

Table 3.6

Results of sensitivity analyses for children's externalising problems outcome

	Children's externalising problems outcome								
Study removed	**Total (N)**	**Intervention group (N)**	**SMD**	**95% CI**	**Overall effect P-value**	**I^2 (%)**	**χ^2**	**df**	**Heterogeneity P-value**
Behbahani et al. 2018	822	419	-0.21	-0.35, -0.08	0.002	0	8.74	9	0.46
Chan & Neece 2018	798	406	-0.21	-0.35, -0.07	0.003	0	9.02	9	0.43
Ho et al. 2021	841	426	-0.26	-0.40, -0.11	< 0.001	7	9.69	9	0.38
Jespersen et al. 2021	746	379	-0.27	-0.42, -0.12	<0.001	6	9.58	9	0.39
Liu et al. 2021	765	387	-0.22	-0.37, -0.07	0.005	9	9.86	9	0.36
Lo et al. 2017	698	354	-0.27	-0.43, -0.11	0.001	11	10.09	9	0.34
Mah et al. 2021	815	411	-0.26	-0.40, -0.13	<0.001	0	8.87	9	0.45
Muratori et al. 2021	828	420	-0.22	-0.36, -0.08	0.002	3	9.25	9	0.41
Schwartzman et al. 2021	844	428	-0.25	-0.40, -0.10	0.001	14	10.52	9	0.31
Siebelink et al. 2021	775	390	-0.25	-0.41, -0.09	0.002	16	10.66	9	0.30
Valero et al. 2021	848	430	-0.23	-0.38, -0.09	0.002	10	10.04	9	0.35

Table 3.7

Results of sensitivity analyses for children's total problems outcome

	Children's total problems outcome								
Study removed	**Total (N)**	**Intervention group (N)**	**SMD**	**95% CI**	**Overall effect P-value**	**I^2 (%)**	**χ^2**	**df**	**Heterogeneity P-value**
Behbahani et al. 2018	1046	540	-0.12	-0.26, 0.01	0.07	13	16.09	14	0.31
Brown et al. 2021	1074	551	-0.14	-0.29, -0.00	0.05	24	18.53	14	0.18
Chan & Neece 2018	1022	527	-0.15	-0.30, -0.00	0.05	27	19.10	14	0.16
Ho et al. 2021	1065	547	-0.17	-0.31, -0.03	0.02	23	18.08	14	0.20
Jespersen et al. 2021	970	500	-0.20	-0.33, -0.07	0.002	0	12.92	14	0.53
Liu et al. 2021	989	508	-0.12	-0.26, 0.02	0.10	14	16.27	14	0.30
Lo et al. 2017	922	475	-0.16	-0.32, -0.00	0.05	27	19.19	14	0.16
Mah et al. 2021	1039	532	-0.17	-0.32, -0.02	0.02	23	18.27	14	0.19
Mann et al. 2016	1074	548	-0.14	-0.30, -0.00	0.05	24	18.43	14	0.19
McGregor et al. 2020	1034	535	-0.15	-0.29, 0.00	0.05	26	18.84	14	0.17
Muratori et al. 2021	1052	541	-0.13	-0.27, 0.01	0.07	17	16.79	14	0.27
Potharst et al. 2019	1044	530	-0.17	-0.31, -0.02	0.02	24	18.49	14	0.19
Schwartzman et al. 2021	1068	549	-0.16	-0.30, -0.01	0.04	27	19.20	14	0.16
Siebelink et al. 2021	999	511	-0.18	-0.32, -0.03	0.02	21	17.83	14	0.21
Valero et al. 2021	1072	551	-0.15	-0.30, -0.01	0.04	27	19.12	14	0.16
Weitlauf et al. 2020	1060	545	-0.15	-0.30, -0.01	0.04	27	19.16	14	0.16

Table 3.8

Results of sensitivity analyses for children's internalising problems outcome

	Children's internalising problems outcome								
Study removed	**Total (N)**	**Intervention group (N)**	**SMD**	**95% CI**	**Overall effect P-value**	**I2 (%)**	**χ^2**	**df**	**Heterogeneity P-value**
Chan & Neece 2018	205	103	-0.39	-0.75, -0.02	0.04	38	3.20	2	0.20
McGregor et al. 2020	217	111	-0.33	-0.73, 0.06	0.10	50	4.01	2	0.13
Schwartzman et al. 2021	251	125	-0.39	-0.70, -0.08	0.01	33	3.00	2	0.22
Siebelink et al. 2021	182	87	-0.18	-0.48, 0.11	0.22	0	0.41	2	0.81

3.6 Discussion

A previous systematic review and meta-analysis investigating the effects of MBIs delivered in-person to improve parent and child outcomes found moderate effects for reducing parenting stress (*g* = 0.53) and small effects for improving child outcomes (*g* = 0.27) (Burgdorf et al., 2019). This chapter advanced the literature by incorporating MBIs delivered remotely, and synthesising only RCTs to improve the robustness of results. Here, pooled effect sizes indicated a moderate effect of mindfulness on reducing parental stress (*g* = -0.42), and small effects for improving children's total (*g* = -0.15), internalising (*g* = -0.34), and externalising (*g* = -0.24) adjustment problems. Effects for parents and children's externalising problems were statistically significant and robust to sensitivity analysis, but were at moderate to high risk of bias, while effects for children's total problems, and internalising problems were not robust to sensitivity analysis and were similarly at risk of bias. It is important to note that the children's total problems composite score was created for the purposes of this analysis from heterogenous measures of different aspects of child adjustment, which may have impacted the results, and also that there were a lack of studies measuring children's internalising problems, providing less power to investigate it.

3.6.1 Findings in context

Effects for parenting stress are in-line with the results of a previous meta-analysis (Burgdorf et al., 2019), as well as mirroring effects of MBIs in general population samples, where moderate reductions in stress/psychological distress were found following MBSR and/or MBCT (*g* = -0.44) (Querstret et al., 2020). In addition, previous meta-analyses focussing on the effects of interventions on parents' stress with neurodiverse children found similar results, including a broader range of both pharmacological and psychosocial interventions (*d*

= 0.53)—noting that pharmacological treatments were no more effective than psychosocial ones (Theule et al., 2018).

In terms of delivery targets (i.e., parents alone, or parents and children in parallel), whilst there were larger effects found for both parenting stress and children's outcomes in the parent-only group, there were no significant subgroup effects found. These results should be interpreted in the light of there being more than double the number of studies which implemented a parents-only intervention (n = 16) as opposed to a parallel parent and child intervention (n = 6*).* For children's outcomes, previous reviews suggest that systemic interventions (such as those involving family systems change, including parent-child and/or co-parenting relationships) are particularly effective for reducing childhood behaviour problems (Carr, 2019). It may therefore be the case that this analysis does not demonstrate parallel interventions to be as/more effective than parent-only interventions due to issues of power as well as heterogenous scale reporting, and the moderate to high risk of bias throughout. However, it may also be the case that improving parent-only mindfulness has subsequent effects on their ability to reappraise their child's behaviour and their relationship with their child (Parent et al., 2016), such that their perceptions of their children's behaviour improve. Therefore, irrespective of objective improvements which interventions simultaneously delivered to children intend to achieve by directly improving children's behaviour, improvement in parent-perception of child behaviour may be enough to target their relationship with their child.

Furthermore, the majority of the studies included here (n = 17) investigated populations of parents of neurodivergent children. Parents of children with neurodevelopmental disorders have been shown to experience more stress than parents of children without these

conditions (Craig et al., 2016), and interventions have been found to have greater effects for parents of children where clinically significant symptoms are present (Bayer et al., 2007; Hiscock et al., 2015). It is therefore not surprising that the majority of studies included here focussed on this population. However, it may be more fruitful in the long term to take a prevention focus to improve child wellbeing (Bierman & Torres, 2016), therefore, it is important to understand the effects of mindfulness for parents and children before symptoms become apparent.

3.6.2 Research implications

When considering children's outcomes, it is also important to note the impact of the wide variety of different outcome measures used in the studies included in this review. This is reflective of issues with defining what is meant by children's adjustment outcomes more broadly (Amerijckx & Humblet, 2014). For example, measures of children's outcomes have been criticised for being drawn from exclusively adult-derived frameworks—disregarding the experiences and narratives of the children they intend to measure (Fane et al., 2020). However, methodological issues arise when measuring young children's psychopathology directly, such as problems with the comprehension of questions (Kwon et al., 2022). This therefore results in parent-report measures being used more often than self-report measures for children under 8 years of age (Kwon et al., 2022), built on conceptual frameworks driven by adults. This raises questions about the validity of such outcomes for children themselves, as opposed to the adults around them (Fattore et al., 2019), and is an important limitation to consider when assessing the evidence base for interventions designed to improve children's wellbeing.

Irrespective of the measures used, however, interventions may be considered only as good as the families they reach. Even for children where problems are apparent, sustained family engagement in intervention programmes can be difficult (Department for Communities and Local Government, 2012). For example, Flujas-Contreras et al. (2019) report in-person attendance for parenting interventions to be around 35-50%, with one in three families agreeing to participate yet never attending. Moreover, this issue has previously been found to be most prevalent in low SES populations (Potharst et al., 2019). In this meta-analysis, of note, only four studies focused specifically on low SES families (Brown et al., 2021; Chan & Neece, 2018; Jespersen et al., 2021; Lo et al., 2019), of which, only one reported attrition rates (Lo et al., 2019).

These engagement and attendance issues are perhaps of particular concern for MBIs which have been demonstrated to have higher attrition rates than alternative psychotherapeutic or pharmacotherapeutic interventions in a range of populations (Lam et al., 2022b). In addition to this, there is notably poor recording of reasons for attrition in the mindfulness in parenting literature (Ruuskanen et al., 2019). Poor parental attendance at MBIs may be compounded by the deleterious effects of SES on parenting stress and parent and child mental health (Deater-Deckard & Panneton, 2017), potentially leaving MBIs directed at low SES families particularly vulnerable to attrition (e.g., Eames et al., 2015—where 48% of participants were lost to follow up), and simultaneously leaving those low SES families without support. Therefore, when designing studies to test MBIs for parents and/or their children to improve either their or both them and their children's wellbeing, it might be fruitful to consider the specific barriers that low SES families face in accessing support (Lo et al., 2019).

3.6.3 Clinical implications

Digital interventions have been posited to offer some solution to engagement and attendance problems as a result of the greater personalisation and flexibility digital tools promise (Mrazek et al., 2019). Such flexibility may be particularly pertinent in light of post-pandemic changes to healthcare access, in particular mental health services (Molodynski et al., 2021; Smith et al., 2020). Within mental health services in the UK, there is a persistent crisis of access for child and adolescent services in particular (Children's Commissioner, 2022; Department of Health [DoH], 2015)—it is estimated that only a third of children are able to access the support they require from the NHS (Children's Commissioner, 2022). If effective, therefore, access to digital tools which support parent and child wellbeing may serve to address some of the common barriers families in the UK face when trying to access support.

Despite the promise of accessibility, there remains limited evidence for MBIs delivered remotely. This review found no significant effects on parenting stress or children's outcomes from digital interventions, however, this is likely more reflective of power issues than effectiveness issues (only three studies incorporated a digital intervention; Guo et al., 2020; Padgett, 2020; Potharst et al., 2019). That this study is simply underpowered to detect effects is supported by reviews of digital interventions in the general population demonstrating similar effects on stress reduction as MBIs delivered in-person (Spijkerman et al., 2016; Taylor et al., 2021). Although parents may be understood to experience unique stresses (Deater-Deckard, 2008) and therefore research from general population samples may not be generalisable to parents, the comparable results from such research remains promising.

3.6.4 Strengths and limitations

This review added to the previous literature by exclusively incorporating RCTs—the previous meta-analysis on which this study was based incorporated only 6 RCTs, here 22 were included. It also differentiated by treatment groups in novel ways, including comparing remote and in-person methods of intervention delivery. This review is, however, restricted in its interpretive power due to the literature available, which largely consists of small pilot trials, at moderate to high risk of bias, and samples biased towards White, high SES families. In addition, the dearth of research utilising digital platforms and parallel parent-child interventions impacted the robustness of subgroup analyses investigating differences in intervention delivery. Moreover, the findings for child outcomes were mixed, likely a result of the heterogeneity of study outcome data and intervention design, as well as child diagnosis.

3.6.5 Conclusion and implications

It has been theorised that mindfulness interventions may be effective at improving children's outcomes by reducing parental stress and consequently parental harshness (Duncan et al., 2009). This review demonstrated that mindfulness can be effective at reducing parental stress, and, although less clear, holds promise for children's adjustment outcomes. However, considerable issues exist regarding the robustness of this evidence, and there are notable gaps in terms of intervention delivery mode (remote, and parents and children in parallel), and typically developing children, warranting further research. Particular attention to the accessibility and acceptability of interventions considering socio-economic factors is well-advised, especially in light of the continued impacts on financial circumstances and parental stress from the COVID-19 pandemic (Fancourt et al., 2022; ONS, 2023a). When considering mindfulness interventions, parents and practitioners might usefully be aware of

the mixed results, and heterogenous evidence base for children's adjustment outcomes, and, until it is more robustly researched, incorporate other approaches with stronger evidence bases. Nevertheless, the promise of mindfulness interventions for both parents and children is highlighted, and the field would benefit from further robust research investigating their effectiveness.

CHAPTER 4

Qualitative report on the feasibility and acceptability of Headspace for parents during COVID-19

This chapter has been adapted from an article (available in Appendix F) published in *BJPsych Open* as: Burgess, A., Cavanagh, K., Strauss, C., & Oliver, B. R. (2022). Headspace for parents: qualitative report investigating the use of a mindfulness-based app for managing parents' stress during COVID-19. *BJPsych Open*, 8(1), e15.

4.1 COVID-19 context

The qualitative data reported on in this chapter was collected as part of Project 2, originally designed to be a mixed methods feasibility study. Ethical approval was granted for this mixed methods study in January of 2020—two months before the first lockdown in the UK (Institute for Government, 2022). It was planned that data collection would begin in February, although this was delayed until March 2020 which coincided with the beginning of the first UK lockdown (Institute for Government, 2022). Due to the unprecedented nature of the—at the time—rapidly evolving and unpredictable guidance, the uncertainty of these restrictions brought about further delays to the start of data collection, until May 2020.

However, as a result of the planning for this study having occurred before COVID-19 was a widely known entity, the original plans for the study did not account for any of the subsequent impacts of the pandemic on family's lives, or on data collection processes. Furthermore, because the study tested the use of an app-based intervention, designed to be

accessed remotely by parents, the intervention did not require any adjustments to accommodate social restrictions. In addition to this, in the initial stages of the outbreak, COVID-19 related restrictions were poorly communicated and poorly understood in the UK (Plümper & Neumayer, 2022), with many people believing they would last only for weeks to months, not years—79% of respondents in a UK-based general population survey stated that they thought social restrictions would end in 6 months or less, of whom 49% thought they would end in 3 months or less (Duffy et al., 2020). Given this, there was little justification for changing the measures included in Project 2 as COVID-19 related experiences could be captured in the semi-structured interviews. However, initial plans for participant recruitment were required to change, as in-person outreach to parents in the local community with no ties to the university, or to the researchers, was not feasible due to the newly imposed social restrictions. Figure 4.1 highlights the general nature of restrictions during this phase of data collection.

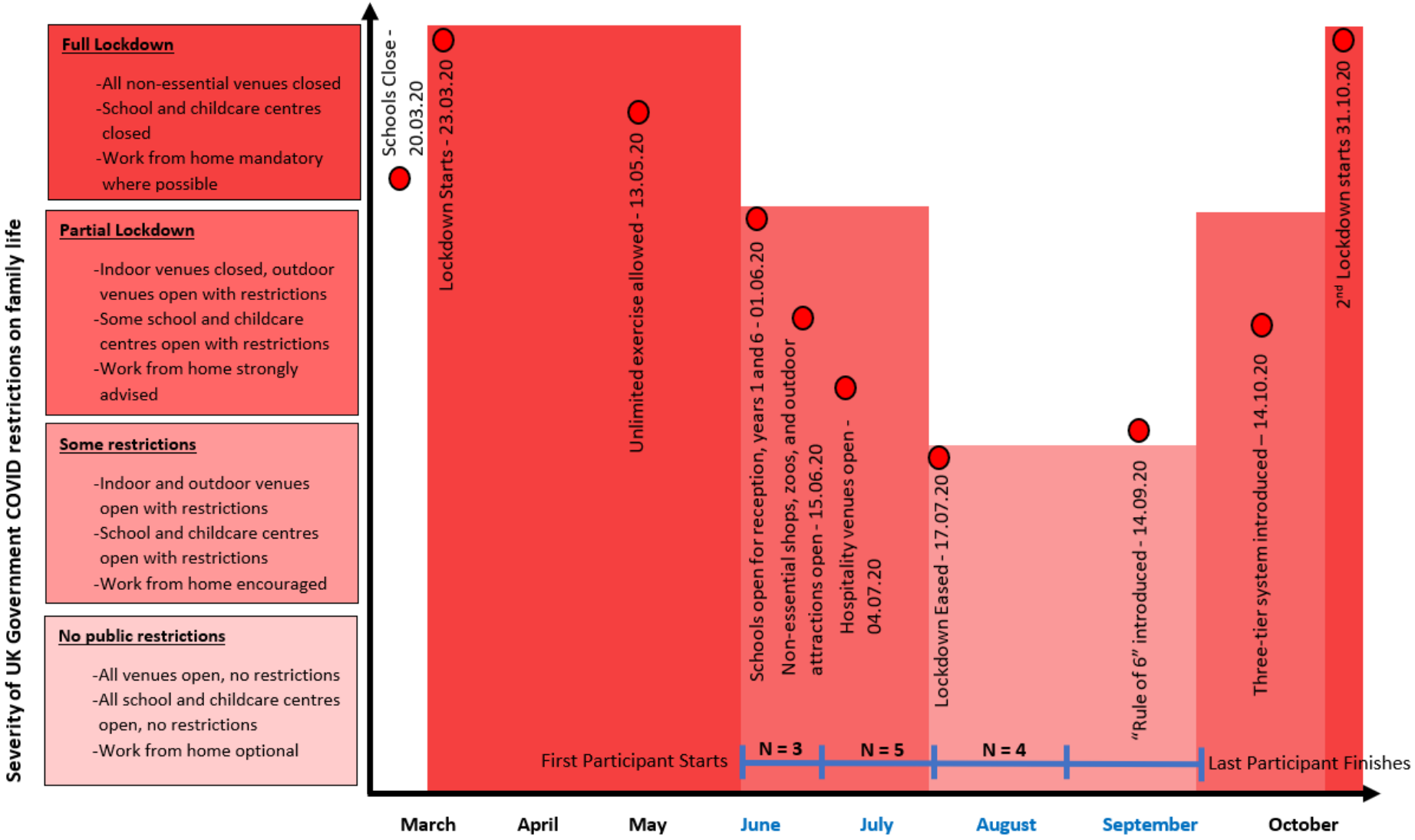
Once the data had been collected, it became apparent that the impact of the entirely novel, and fluctuating, restrictions on families' lives had had a significant influence on the content of the semi-structured interviews as well as elements of the FMSS data collected. It also became apparent that the quantitative data collection had failed to record different elements of participants responses, and more broadly that the measures used were not necessarily reflective of the outcomes intended, resulting in data that did not reflect the experiences of participants as clearly or meaningfully for the time period as the qualitative data. Furthermore, as there was little to no evidence regarding the lived experience of families during the pandemic at the time of data analysis and write up, the qualitative data collected

as part of Project 2 had the potential to contribute in a very meaningful way to the literature base to highlight this lived experience.

As such, the qualitative data was published, and is presented here. The published paper explored the original aims of the study (understanding the feasibility and acceptability of giving *Headspace* to parents) explicitly within the broader social context in which using *Headspace* happened—i.e., the impact of COVID-19 on family life in the UK. This chapter should therefore be considered in the light of the decision to publish the qualitative elements of the study only, as, in compiling this thesis, it was also decided to incorporate the quantitative evidence collected. This was because, whilst uninterpretable for a more general audience, it did contribute to the context of, and planning for, Project 3 and is therefore presented in Chapter 5.

Figure 4.1

Impact of COVID-19 restrictions in the UK on planning and recruitment for Project 2



Note: This visualisation of the different stages of lockdown restrictions in the UK in 2020 uses the dates of family-specific significant restrictions recorded by the Health Foundation's COVID-19 Policy Tracker (2021), and the Institute for Government's timeline of UK government coronavirus lockdowns and restrictions (2022).

4.2 Abstract

Stress can compromise parental wellbeing and may contribute to harsh and critical parenting styles, which are in turn associated with children's adjustment problems. COVID-19-related restrictions are likely to have exacerbated parental stress as, for many, UK-based family life was altered considerably. Mindfulness has been demonstrated to improve stress management and emotion regulation when delivered to parents in-person, however, more accessible digital interventions are under-researched. This study aimed to provide preliminary data on parent and child wellbeing and parent-child relationships as well as the acceptability and usability of the *Headspace* app—a self-delivered mindfulness-based intervention—for parents in low-risk families during the early days of the COVID-19 pandemic. 12 parents were given access to *Headspace*, and qualitative (semi-structured interviews and five-minute speech samples) and questionnaire data were collected immediately following the initial COVID-19 lockdown in the UK. The qualitative transcripts are thematically analysed here. Most parents reported *Headspace* to be acceptable and useful—improvements in parents' own sleep were particularly noted—and there was high adherence to the intervention. However, difficulties related to family wellbeing and parent-child relationships following the lockdown were also reported. Due to the confounding impacts of COVID-19 restrictions, and varied access to app content, we were unable to determine any outcomes to be a result of practising mindfulness specifically. However, COVID-19 has had profound impacts on many UK-based families, including those previously at low-risk, and these results demonstrate that *Headspace* may have beneficial effects for parents. There is a need for more rigorous studies using this tool with a broader range of families.

4.3 Introduction

Already an existing crisis, the mental health of children and young people is of grave concern in the post-pandemic era (Holmes et al., 2020), with both internalising problems (e.g., depression, anxiety) and externalising (behavioural) problems seen as common concerns (Holmes et al., 2020). Worldwide, COVID-19 and associated lockdown restrictions are projected to have serious long-term implications for the mental health and wellbeing of a range of families and young children, including those who may not have been classified as vulnerable prior to the pandemic ('low risk') (Galea et al., 2020). Parent-focused parenting strategies (e.g., harshness and criticism) are associated with both increased internalising and externalising problems in neurotypical children (Flouri & Midouhas, 2017). Parental stress can exacerbate the use of these negative parenting strategies (Patterson, 1982), making it a key target for intervention, arguably in particular since parental stress has been heightened by COVID-19 (Portnoy et al., 2021).

4.3.1 Mindfulness-Based Interventions (MBIs)

Mindfulness is characterised by non-judgemental awareness and acceptance of present-moment experiences (Kabat-Zinn, 2003). Mindfulness-Based Interventions (MBIs) aim to cultivate mindfulness though meditation practices and teacher-led discussion, with a wealth of evidence showing beneficial effects on stress, mental health, and wellbeing, including self-help mindfulness resources, in non-clinical (Cavanagh et al., 2014; Chiesa & Serretti, 2009) and clinical settings (Goldberg et al., 2018). The skills taught in MBIs have promise in the parenting context since, in addition to beneficial effects on stress, it is proposed that mindfulness improves emotion regulation, and self-efficacy (Parent et al., 2016)—furthering their potential to interrupt negative parent-child cycles (Dumas, 2005).

When delivered to parents, MBIs are most often delivered in group format, in-person, and to families at risk for serious mental health difficulties, or to those with neurodiverse children who are thought to experience higher levels of parenting stress (Burgdorf et al., 2019; Craig et al., 2016). This is not surprising given that most MBIs are based on the MBSR framework, which involves a high level of facilitator expertise (Crane et al., 2017). However, self-directed MBIs are gaining ground, particularly in non-clinical settings, offering the potential for efficient approaches to intervention and prevention (Cavanagh et al., 2014; Taylor et al., 2021). Demonstrating the efficacy of preventative interventions is acknowledged to be difficult (Costello, 2016), but prevention is an increasingly key priority in mental-health care and research in the UK (Public Health England, 2018), and it may be argued to be of critical importance in the parenting setting where there are opportunities to improve young adults' outcomes in the future. Yet, despite low-risk families not being entirely impervious to mental health challenges (Wille et al., 2008)—arguably particularly following pandemic-enforced social restrictions—there is a lack of research into the effects of digital, self-delivered MBIs for parents of neurotypically developing children, in low-risk families (Burgdorf et al., 2019).

4.3.2 Mode of delivery

Digital, self-delivered, interventions are proposed to be both more accessible and cost-effective than in-person approaches (Linardon et al., 2019), yet there are concerns in non-clinical populations around effectiveness and poor engagement (Renfrew et al., 2020). Regarding mindfulness specifically, concerns are that practice without therapist guidance may result in a greater frequency of adverse events (Farias et al., 2020), although this may be mitigated by using guided meditations (Daudén Roquet & Sas, 2018). It has been proposed

that increasing the acceptability of remote, self-directed interventions may lie in addressing preconceptions of digital tools, as hypothetical acceptability is often lower than actual acceptability on their implementation (Berry et al., 2016). As these forms of intervention are relatively novel, there is a need for wider research to ascertain the best way to implement them in practice (Lau et al., 2020).

4.3.3 The current study

Headspace is a commercially available smartphone-app that provides self-directed content designed to support mindfulness practice alongside a broader suite of materials supporting mental wellbeing and performance (e.g., exercise and sleep), and is the best-evidenced self-help app available to the general population (Lau et al., 2020). In RCTs, *Headspace* has been demonstrated in diverse adult populations to produce small between-group post-intervention differences in favour of *Headspace* compared to control groups for reductions in stress (g = 0.24), anxiety (g = 0.21) and depression symptoms (g = 0.36) (Gál et al., 2021). Whilst its effectiveness has been tested in a wide variety of clinical and non-clinical contexts (Lau et al., 2020), despite its relevance and promise, nothing prior to this study had been conducted with parents. Thus, this study aimed to investigate the use of *Headspace* by a small number of low-risk families, collecting app usage data, as well as in-depth qualitative data, and questionnaire data (reported in Chapter 5), to ascertain parents' experiences of *Headspace,* and of family wellbeing and parent-child relationships. The over-arching research question was, what are parents of young children's perceptions and experiences of using a self-directed mindfulness app to manage their stress, in relation to their experiences of being a parent?

4.4 Methods

4.4.1 Design

This small pre-post feasibility study examined the use of *Headspace* by a small number of families in the UK, collecting in-depth, qualitative data and questionnaire data to ascertain its acceptability and usability. Here, thematic analysis was employed to identify themes within the semi-structured interviews and five-minute speech sample (FMSS) transcripts.

4.4.2 Ethics statement

All procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation, and were approved by the Department of Psychology at Goldsmiths, University of London (Ethics Committee Approval: PS080120ABS). Written, informed consent was obtained from all participants, and anonymous identifiers have been used for all illustrative quotes.

4.4.3 Participants

Via social media, a volunteer sample of UK-based parents (aged over 18) of children aged 2-5 years old, with no self-reported, pre-existing, neurodevelopmental or mental health conditions, with access to an internet-enabled smart device, and no experience of meditation or use of the *Headspace* app in the last six months were recruited. A pre-determined sample size of 12 was achieved as this is proposed to be sufficient to incorporate into a thematic analysis (Guest et al., 2006), and simultaneously small enough for the originally planned mixed methods feasibility study (Kooistra et al., 2009).

A demographically homogenous sample of 12 parents (from 12 families) were recruited, 11 of whom identified as White or White British, were married or cohabiting with a partner,

and were mothers (one single parent, and one father). Mean parental age was 42 years (SD = 3.58 years) and mean target child age was 3.5 years (SD = 1.08 years). Six (50%) participants reported being single-child households, three had a second child under one year old, and three had a second child older than five years. Most (n = 11) parents reported being educated to at least undergraduate degree level (half to either master (n = 4) or doctoral degree levels (n = 2)), and all parents were employed at the time of the study. Participants were given free access to *Headspace* for the duration of the study and were further incentivised on completion with a voucher worth £15.

4.4.4 Materials

Five-minute speech samples (FMSS) (Gottschalk & Gleser, 1979) were collected from parents pre- and post- *Headspace* intervention. Participants were telephoned or video-called and asked to talk for five minutes uninterrupted, answering the following prompt: "Please tell me what you've been thinking and feeling about (your child) in the past two weeks. What your relationship with (your child) has been like, and how well you have gotten along with them in the last two weeks". Participants also engaged in a semi-structured interview at a 2-week follow up telephone or video call, lasting for between 30 and 45 minutes. The topic guide is available in Appendix E. Audio recordings for the pre- and post- intervention FMSS, and semi-structured interviews were transcribed and anonymised before being qualitatively coded.

4.4.5 Intervention

Unique, study-specific codes to access the *Headspace* app were provided to participants, giving them free access for a total of 6 months, although the intervention period

only lasted for 30 days. Participants were asked to use the three Basics packages on the app, however, no specification was given for the duration of the mediation chosen, and no limitations were placed on participants' use of the rest of the app's content. App usage data was collected from *Headspace* for only the duration of the 30-day intervention, starting from when parents registered the app with their access code. More details on participants' app usage are available in Chapter 5.

4.4.6 Data analysis

Reflexive thematic analysis was chosen over other qualitative approaches because it is not tied to one epistemological or ontological position, and is useful in identifying overarching themes across participant responses (Braun & Clarke, 2006). In particular, thematic analysis has been described as a "translator" between qualitative and quantitative approaches, enabling researchers using different methods to better understand each other which can be argued to be particularly pertinent for mixed methods research as was conducted here (Nowell et al., 2017). Furthermore, although this research was interested in participants experiences, thematic analysis was chosen over phenomenological approaches (such as Interpretative Phenomenological Analysis) because such approaches explicitly avoid cross comparisons which were deemed to be essential in identifying the overarching themes across participants to assess feasibility and acceptability as part of a pilot trial (Braun & Clarke, 2020). Moreover, whilst a narrative analysis may be considered appropriate for understanding the dynamics of participants narratives from within their context (Zelčāne & Pipere, 2023) (here, relevant for understanding participant responses during different experiences of the COVID-19 pandemic), a pluralistic approach incorporating narrative and thematic analysis was not taken due to the identification of central themes being a prioritised outcome of analysis. For

this outcome, and the epistemological position of the researcher, a reflexive thematic analysis was understood to be the most appropriate and flexible method (Zelčāne & Pipere, 2023).

Coding was conducted in six stages (Braun & Clarke, 2006) utilising an iterative and inductive approach to the data to produce a rich and encompassing reflection of participants experiences. Collaborative confirmation of the final coding was utilised, however, independent second coding was not conducted, as a social constructionist approach to analysis was taken, acknowledging the role of the researcher in the interview, and the perspectival nature of the findings (Braun & Clarke, 2006; O'Connor & Joffe, 2020).4.5 Results

Participants in this study completed on average 26 (SD = 11.84) out of the 30 "Basics" sessions they were asked to do (ranging from 1 to 43 sessions). Six participants also used the sleep content (completing an average of 4 sessions, SD = 9.01, although the range was also large, from 1 to 29 sessions). Three participants also used the app with their children, although this was less frequent (completing an average of 1 children's meditation session, SD = 1.08, ranging from 1 to 3 sessions), with two participants also using the children's sleep content specifically (completing an average of 1 session, SD = 1.27, ranging from 1 to 4 sessions). Table 4.1 presents the demographic details of the participants, and identifies the gender and number of children each participant as a table of reference for the illustrative quotes to better contextualise them without identifying the individuals who provided them.

Table 4.1

Sociodemographic characteristics of participants in Project 2 (N = 12), with corresponding gender and number of children per anonymised participant number

Baseline characteristic	Full sample	
	M/n	**SD/%**
Parents		
Age	42.00	3.68
Age at birth of first child	37.00	3.83
Gender (n, %)		
Female	11	92%
Male	1	8%
Ethnicity (n, %)		
White	11	92%
Prefer not to say	1	8%
Marital status (n, %)		
Married living together/cohabiting	10	84%
Married living apart	1	8%
Single	1	8%
Total number of children (n, %)		
One	6	50%
Two	6	50%
Target Child		
Age	3.42	1.08
Gender (n, %)		
Male	8	67%
Female	4	33%
Ethnicity		
White	11	92%
Prefer not to say	1	8%
Sibling		
Age	4	1.45
Gender (n, %)		
Male	3	50%
Female	3	50%
Ethnicity		
White	6	100%
Participant Number	**Gender**	**Number of children**
1	Female	1
2	Female	1
3	Male	2
4	Female	2
5	Female	1
6	Female	1
7	Female	1
8	Female	2
9	Female	2
10	Female	2
11	Female	1
12	Female	2

Note. Target child age ranged from 2-5 years old. Frequency % rounded to integer where possible, or first decimal place to sum 100%

Five over-arching themes were identified from a thematic analysis of participants semi-structured interviews and FMSS data, which are presented with illustrative quotes—in relation to use of the *Headspace* app, Acceptability and Feasibility, and in relation to family experiences of COVID-19 lockdowns, Lockdown Tensions, Gains, and Easing of Restrictions. Details of these themes and the related subthemes are further expanded on in Table 4.2.

4.5.1 Acceptability and feasibility

In terms of acceptability of the app, there were just two reports of negative experiences using *Headspace*, but these are important to note as they are not often recorded in the extant literature (Farias et al., 2020). One participant reported associating physical sensations with breathing difficulties linked to asthma:

> *"Concentrating on my breath…I was getting…that sort of feeling of relaxation and sort of slightly…ugh it's not quite the right word, but almost…sort of…giddiness, I guess? ...I would find myself worrying that I was getting that feeling not because I was meditating but because I was breathing incorrectly or something. Which I know is a strange thing that ties in with that feeling of asthma, and that feeling of, if I'm concentrating on my breathing, there's something hardwired in my brain to be saying to me, what's wrong? …Are you ok? Are you breathing enough?" – P3 (father, two children)*

Of note, there is some move away from using the breath as the only anchor point in mindfulness teaching (Anderson & Farb, 2018), these results suggest that this may indeed be pertinent for some people. The other negative experience was centred around sleep disturbance. Although the participant did not report this as lasting, it is note-worthy since they found it to be distressing and negatively impactful on their perception of mindfulness:

"I was doing it last thing at night for quite a while, and I wasn't sleeping afterwards. It was waking me up, rather than calming me down…my husband noticed it and he was like, 'you've got to stop doing them at night'…when I stopped doing that at night, it was noticeable that my sleep went back to being fine." – P6 (mother, one child)

This was markedly different from the majority of participants (n = 11) who reported the app to be beneficial for their sleep. Although noting a feeling that the meditation was 'gearing them up' for the day ahead, most parents (n = 9) nonetheless found it easiest to schedule into their night-time routine. Irrespective of the time of day, parents reported getting a better quality of sleep as a result of practising mindfulness, and, although not the intention, those using the app at night specifically spoke of being lulled into sleep more quickly as a result—and commonly of falling asleep during the exercise:

"I think if I'd been able to do that daily practice at the beginning of the day…it would have been even more helpful because, although …it was probably really helpful in terms of getting to sleep, …I think …my challenge was hanging on to it for the next day, and staying awake!" – P5 (mother, one child)

"I definitely felt more patient, actually. I think it, I don't know whether it just helps me sleep…a lot quicker, and very soundly" – P8 (mother, two children)

Although this qualitative data suggests that parents experienced a reduction in stress over the course of this study, as a result of fluctuating government restrictions in the UK (see Figure 4.1), it was not possible to determine whether these findings were a result of using *Headspace*, or a result of the timing of data collection. However, most parents (n = 8)

attributed the reduction in their stress to be a result of learning to be mindful during an emotionally complex lockdown, including perceiving vicarious utility for their children's emotion management skills:

> *"…if I'm feeling fear, I can do this for me, if I'm feeling anxious, I can do this, I can focus, if I can't sleep, I've got these tools. That's how it feels to me, it's like a whole load of tools, I've got some extra tools in my belt now, as a parent, that I can use to make me a more rational parent, a calmer parent, a more focussed parent, and [we are] starting to get some of those tools into my daughter's bag that's going to help her regulate her emotions and communicate clearly what she needs and what she feels. So, I think I'm very grateful for the experience that we had." – P11 (mother, one child)*

In addition to most parents reporting the intervention to be helpful, its method of delivery—i.e., self-directed via an app—was also evaluated positively (n = 11), with some participants explicitly describing it as preferable to participating in-person due to the privacy and autonomy, as well as the convenience, of being able to access the intervention on their phone:

> *"…it was quite nice to be able to do it without anyone there that could potentially judge, I guess. Nobody had to know I was doing it, whereas, if you go to a group, they do..." – P6 (mother, one child)*

> *"I think it's actually quite a vulnerable thing. Like just sitting there in silence, like, you know, it only takes one person to cough, or sniff, or, and…I think I'd*

step out of where I was quite quickly. But, with this, you know, you're in your own world which I really like." – P4 (mother, two children)

4.5.2 COVID-19 and the family

Headspace was widely reported in this sample to be both feasible in parents' daily life and acceptable (n = 11). However, some parents (n = 6) explicitly stated that the specific—and unforeseeable—timing of the study in terms of COVID-19 impacted their experiences. Some (n = 2) explained that they would have found it more useful to have tried the app in advance of the lockdown:

"I think it's quite an interesting study for this time. I think if it had've been a year earlier, it would have been very useful for COVID!" – P6 (mother, one child)

others (n = 4) that, in fact, access to *Headspace* was timely:

"…it's unfortunate your study's coming now, but in terms of the lockdown, and like people being isolated and alone…there's some amazing content on there." – P7 (mother one child)

Some insight was also gained into the impacts of COVID-19 specifically in terms of participants' relationships with their children. Strikingly, these experiences can be delineated into the different stages of the lockdown during which they participated—immediately following the full UK lockdown, followed by the relaxation of rules in the summer, and then the transition for children back into school and nursery (see Figure 4.1 for the numbers of participants recruited at each stage).

4.5.2.1 Semi-lockdown: June & July 2020

Semi-lockdown was largely considered a period of significant uncertainty. Family tensions directly attributed by parents to the effects of the pandemic were most often (n = 7) reported as difficulties caused by the various and fluctuating governmental rules during this period:

> *"In all honesty, the past two weeks have been a little bit tricky…I think the current situation we're in in terms of a semi-lockdown could be part of the problem. [My son]…seems to be struggling a little bit…maybe a little bit more frustrated at times" – P9 (mother, two children)*

> *"…we'll see some of his friends, but we can't see other friends…he's finding that harder to understand, and therefore there's been more sulking and tantrums going on. Because sometimes we can go, and sometimes it's a no, and I can see how that's harder to understand." – P5 (mother, one child)*

For some (n = 4), these tensions were gendered, in that mothers reported feeling the burden of responsibility fell to them rather than their partners, as intense pressure and guilt to be both a mother and balance work, as well as household administration:

> *"I'm just at the computer and I'm on the phone to people, which is horribly dull, and I always feel really bad. But at the moment, I can't help it—we are just juggling things…I'm often the one that's not doing the fun things…I have to be the practical one, I have to be the one working, I have to be the one juggling things." – P12 (mother, two children)*

4.5.2.2 School summer holiday: August 2020

Over the summer holiday, some family pressures were relieved by being able to take time off during a period when restrictions were significantly reduced. The most notable reported change was on the quality of children's sleep and their behaviour (n = 4):

> *"…we've been on [summer] holiday…So we took her to the park, and we took her to the zoo, we went out and played in the local playground in the place where we went to go and stay and she…just absolutely adored every second. And I think that it's just so lovely to see her light up and wake up every morning and have had, you know, 12, 13 hours of sleep and 3 hour naps a day just because she's been so wiped out from having so much fun." – P10 (mother, two children)*

In addition, the role that access to extra-familial support played in improving their children's behaviour was widely reported (n = 11):

> *"We had a visit from his aunt yesterday, and, you know, he was just delighted, and the change to his behaviour was quite stark." – P9 (mother two children)*

> *"…now we've sort of gone through lockdown, my mum has sort of been looking after [my daughter] and that has a massive impact on my relationship and how we are together, like how I view her, because I've got time away as well. And you can have that little break and come back to it and you're like oh my gosh I've missed you so much! These are all the things I love about you!" – P8 (mother two children)*

4.5.2.3 Return to school: September 2020

Some parents (n = 7) reported finding their children's return to nursery or school to be challenging—especially following the extended absences earlier in the year, and the continued difficulties in accessing regular childcare:

> *"…we've been doing a fair amount of preparing for school, there's been a bit of a balancing act that we haven't had for a very long time because of COVID, of my husband starting back at work in his school, so therefore having to work out childcare with our usual methods not being quite as accessible as they were before. So, that's been a little bit of a struggle…" – P2 (mother one child)*

The consequences of school returns were experienced by some (n = 3) as difficulties with sleep once again:

> *"I think, you know, coming alongside going to nursery and being so stimulated [after lockdown ended], her sleep hasn't been amazing which is really unlike her. So, we've had a handful of really bad nights which, honestly, was absolutely draining and exhausting." – P8 (mother, two children)*

4.5.2.4 Relative freedom: August-September 2020

Importantly, however, there were also reports of positive experiences during the pandemic, notably on participants' perceptions of their children, and their attitude to life more broadly. For example, some mothers (n = 6) noticed and appreciated the sensitivity of their child to their—the mother's—distress, and the resultant empathy after what has been a difficult year at home:

"…he saw me crying because I…had enough, I was too overwhelmed with work, and he comes to me and says—he gives me a cuddle, and says—"Mummy, I'm here". Like the same way that I do when he is upset…and it was so sweet. He is a good boy." – P1 (mother, one child)

"He has been really good since I was poorly last week, and he likes to pretend to be a doctor. So, he'll come along with his toys and he'll go, "open your mouth", and check me out, and he's really caring—finishes it off with a sticker for being a good girl, and off he goes again." – P7 (mother, one child)

Appreciating the "little things" was also reported by parents (n = 7) as a change to the way they perceived their family which they may not have experienced without the enforced lockdown:

"I think COVID's really helped in the kind of simple pleasures and the simple joys of just appreciating on a child's level maybe, which is often quite tricky in a busy life. COVID's given us a chance to calm down a bit and have a reset." – P2 (mother, one child)

"We've had a couple of little "sleep overs" [*with each other, during lockdown*]*, which is her favourite activity at the moment…So, she'll only go to bed about an hour later than she normally would, but it's so special for her because there's so few things we can do, so that's really nice." – P10 (mother, two children)*

Table 4.2

Table expanding on the themes and subthemes identified from a thematic analysis of participants semi-structured interviews and five-minute speech samples

Theme	Sub-theme	Brief description	N	Illustrative quote
Acceptability	Attitudes	Being open minded and a belief in *Headspace* helps; framing is paramount.	11	"I think British people are very reluctant to try new things at the best of times...There are going to be people that are sceptical, and from the get-go are going to go, this isn't going to work for me, and then it won't work for them. You have to be an open person to be able to give it a try, don't you?" – P10 (mother, two children)
		Derogatory perceptions of mindfulness, trends in the public consciousness, often related to age.	5	"When I told my dad I was doing this, he was like, meditating?! Why are you doing that?! And it was just the way he asked me, it was almost like I'd said, oh, you know, I take drugs twice a week or something, you know" – P4 (mother, two children) "It's like veganism, isn't it? It's all that kind of. I don't know, hippy sounds like a derogatory word for it, but you know what I mean, just slightly more that way. But yeah, I think it's just become a bit more fashionable." – P11 (mother, one child)
	Negative	Breath-related and sleep disturbance	2	"Because of my asthma...Concentrating on my breath, I found, threw up a lot of thoughts, certainly at first. I should say, because of the breathing thing—and this

	reactions			happened less towards the end, though it was still happening occasionally—I must have met a resistance—I don't think I was—but I was getting a…getting that sort of feeling of relaxation and sort of slightly ugh it's not quite the right word, but almost sort of giddiness, I guess? I'm not sure if that's quite right. And certainly at first, while I was in the process, I would find myself worrying that I was getting that feeling not because I was meditating but because I was breathing incorrectly or something. Which I know is a strange thing that ties in with that (laughs) feeling of asthma, and that feeling of, if I'm concentrating on my breathing, there's something hardwired in my brain to be saying to me, what's wrong? You know? Are you ok? Are you breathing enough?" – P3 (father, two children) "I was doing it last thing at night for quite a while, and I wasn't sleeping afterwards. It was waking me up, rather than calming me down...I don't really know why they were keeping me awake, it didn't seem logical, because I think the actual process was actually quite calming. I mean, my husband noticed it and he was like, you've got to stop doing them at night. I don't know why, it doesn't make sense, but, the thing that should be calming was keeping me awake. But it was noticeably that, so when I stopped doing that at night, it was noticeable that my sleep went back to being fine." – P6 (mother, one child)
Feasibility	Autonomy & Privacy	Parents appreciated the autonomy and privacy of using an app to learn	11	"[I] found the actual class itself [in-person] quite...intimidating is not the right word, but I found myself quite self-conscious of it. So, it was quite nice to be able

		mindfulness in their own space		to do it without anyone there that could potentially judge, I guess." – P6 (mother, one child)
	Scheduling	Demands on parents' time are great; recognition of these struggles by *Headspace* may help	12	"Yeah! I always say, oh well I'll do it in a bit, I'll do it in a bit, I'll do it in a bit, and then the bit never comes. There's always something else that I have to put first, whether it's my son, or cooking, or cleaning, there's always something like oh I really should be doing that, I shouldn't sit down, I need to be prepping this, doing that. And it's difficult to put myself first, it really is." – P7 (mother, one child) "I felt guilty in some moments in the beginning that I struggled to start, because I'm like, oh my god I'm just tired. And it's so easy to go to do it for a few minutes but I can't stop with three minutes to lay down and do it properly. Maybe something that accepts that being a mother and doing work and being with kids is difficult. It's difficult to change behaviours and the way that you fit things that you know that are healthy and that can help you on a daily basis. Yeah. Change is really difficult!" – P12 (mother, two children)
	Routine	Incentive and embedding *Headspace* in routine increased likelihood of adherence.	10	"It is a short amount of time, but I know I would have gone, oh I'm just really tired, or oh I'm just not in the mood for it, or something, so, you know, because it's contributing to something else, it was easier to stay more disciplined." – P10 (mother, two children) "I think the impetus of this study that you're doing, and having committed to it

				for someone else was really useful. And I think, for me to do it, and I think the results of that have been really useful to push me to want to continue it" – P2 (mother, one child)
	Sleeping	Fitting *Headspace* in at night was incidentally beneficial for sleep.	10	"I definitely felt more patient, actually. I think it, I don't know whether it just helps me sleep—fall asleep, it doesn't necessarily keep me asleep—but it certainly helped me fall asleep a lot quicker, and very soundly, which definitely helped when my daughter was waking me up in the middle of the night for two hours. And I didn't feel stressed or anything, I just felt very calm about the fact that, oh well, I'm going to be up now and, you know, just got to parent in the middle of the night. Whereas before, I would have been irritated, I could have easily been irritated by the fact that my sleep had been disturbed. And I have like mild sleep anxiety, so...I think it really helped with that. And just rationalising a lot of it." – P8 (mother, two children) "I'd always do it once the boys had gone to bed, so I only ever did it in the evening. Because.it wouldn't be possible to do it at any other time. And quite often, I'd do it just before I went to bed. And which, I have to say, I am aware that some of the times I definitely fell asleep doing it, so I wasn't especially being mindful, more just totally relaxing. But, that also sort of has benefits because sometimes it takes quite a long time before I go to sleep, so then knowing that it definitely helped me get off to sleep, I then had to concentrate on, I was like, this isn't to put you to sleep, this is supposed to be concentrating on, you know,

				calming yourself down, not just actually falling asleep—that's kind of cheating." – P4 (mother, two children)
	Emotional Toolkit	*Headspace* improved emotion regulation and stress management skills	11	"So, I feel, I feel maybe like I'm a better parent, in the sense that I am a calmer parent. I can notice things better with him. I was always very proud of him, but I'm even more proud." – P5 (mother, one child) "Sort of a little, you know, mental post it note saying "be a bit more aware of where you are", and especially at—it tended to be after work, when maybe my wife was making dinner for the kids and I had a half an hour or something to play with them and ask them how their day was and that sort of thing. It tended to be there more, so if I was giving him a cuddle on the sofa watching CBeebies or whatever, it'd almost be then that the mental post it note would kick in and that feeling of actually being present when you're being cuddled by and cuddling people that you sort of love unreservedly, it's quite a powerful feeling. And just that mental note to do that and, you know, be present at these times when, you know, your brain is programmed to give you all these endorphins and all you have to do is sit there and enjoy them! That was really powerful." – P3 (father, two children)
	As Exercise	Parallels between mindfulness as a mental exercise, and physical exercise; effort increases benefits	10	"...it's like doing my physical exercise. It may not be the most appealing thing to start with, when you've got other pressures on your time, but once you've done it, you feel better and you start to see the benefits in other parts of your life as

				well." – P3 (father, two children) "But from that moment when you actually manage a little bit, and then you manage a little bit more, and then a little bit more, it compensates for the initial frustration of, I can't do this, and I need to do something else. And then it's like running, the more you run, the longer you want to run. So it was challenging at the beginning because I couldn't really disconnect, but now that I can connect, I want to see how long can I be focused." – P1 (mother, one child)
	Reciprocal benefits	Noticeable benefits for their child/ren—even where no children's content was accessed.	9	"It helps me, and actually, it helps him. Now, sometimes, he says, when I know that he's getting frustrated and I say, do you have to do something? And he says, yes, I have to count to ten. And he counts to ten, and he gets a bit calmer. Sometimes, he even imitates me when I'm like [breathes deeply] and he goes [childish deep breath]. [Spoken to the child] "You're learning!". It's skills that are getting passed from me to him." – P1 (mother, one child) "We've also been spending time together meditating...because of the app, we've found that there is a monster meditation that we can enjoy together. So, she's really been learning those skills about calming herself down, about taking a deep breathe, about belly breathing, and things like that. We're doing the app together as well, which I think has really helped. Like it's helped her manage her emotions, which helps me feel better about it because she's got a little bit more control, and that gives both of us a bit more patience with each other. So, things like that where I can see her relaxing as well, makes me feel so happy that she's

				developing those skills and I think that helps our relationship massively." – P11 (mother, one child)
	Me time	Refocusing onto themselves, sometimes as parents this was a difficult adjustment	10	"One thing that I found really helpful was the time to focus on myself. So, regardless of whether it's then a change in terms of approach, or in terms of, I suppose my own thought process maybe, and the fact that I don't leave the house at all at the moment still, to have just a little bit of time to focus on me was actually really quite nice." – P7 (mother, one child) "And once…you've started, it's great and it does relax you straight away, but it doesn't seem like finding ten minutes would be that hard, but there's always something else that feels like it should be done." – P5 (mother, one child)
	Self evaluation	Negative evaluations of their capacity to be mindful; feelings of selfishness and failure	9	"Initially, the fact that it challenges you to just be present in the moment, and not think about, and not let your mind wander, I found that quite challenging. And it felt like you were failing all the time." – P1 (mother, one child) "Well, yeah, because it's for self, isn't it? The whole point of it is that it's for self, and that's not something that I'm attuned to. We've always done stuff as a family. And I know that it's meant to interlink, but we've always done stuff either for the family, or as a family. So to suddenly be like [imitates snooty voice], well actually, I need to go and do this...I dunno, it didn't quite..." – P6 (mother, one child)

	Timing	Challenges inherent with the pandemic; prevention better than cure	6	"Yeah, it's an interesting one as a kind of, I think it's quite an interesting study for this time. I think if it'd had've been a year earlier, it would have been very useful for COVID!" – P6 (mother, one child) "Like, timing wise, with my daughter going to school, there couldn't be a better time for me to try something to relax, to stay calm, to not be caught up in my mind so much. Like, literally, for me, this is the biggest challenge I've come to face yet, sending her to school, so there's been other things that I know other people would find difficult, but for me, this is the time that I've found most difficult, so having something that, like, helps me, because like at night time, that is when I'd be thinking the most, ruminating, like I would lie there for hours just with my own thoughts, running away with it." – P2 (mother, one child)
Lockdown Tensions	Juggling act	Complication of home life with addition of home working and schooling— particularly for mothers	11	"According to him [my son] my job's very boring! Because I'm just at the computer and I'm on the phone to people, which is horribly dull, and I always feel really bad. But at the moment, I can't help it— we are just juggling things. It's not a normal time. And I think that makes it very difficult for everybody. So, I'm often the one that's not doing the fun things. When his dad's home, he's home and he's not working. And so he gets to be the fun one! Whereas I have to be the practical one, I have to be the one working, I have to be the one juggling things, or dropping him off at nursery and walking away for the day. I'm that one. And I think there are times when I feel that probably more than him, that I have

				to be the boring one, I have to be the practical one, I have to be the one that makes sure he gets washed and has to go to bed and think about what he's going to eat, and that he's watched too much TV." – P12 (mother, two children) "I feel like I need to be more on it as a mum, in terms of being able to support and help him through" – P5 (mother, one child)
	Acting out	Increases in externalising behaviours and sleep problems for children	11	"He does something that I totally hate, which is whining. Oh my God. Since he returned to school, after the lockdown, it has been horrendous! If I say no to something, he starts whining. And I say, "don't whine, if you whine, I'm not going to listen to you", so he whines even more, and I'm like, "stop". I can't deal with this! I can't deal with all this whining! And so today I have discovered when talking to the teacher in the nursery that she was like, "Yeah, since they've come back, there's loads of people whining". – P1 (mother, one child)
		Confusing rules increased children's frustration with mixed messages	7	"The past two weeks. In all honesty, the past two weeks have been a little bit tricky. I'm not 100% sure why. I think the current situation we're in in terms of a semi-lockdown could be part of the problem. But [my son] I think seems to be struggling a little bit. And what I mean by that is he is less able to control his—maybe a little bit more frustrated at times." – P9 (mother, two children) "We'll see some of his friends but we can't see other friends and I think he's finding that harder to understand and therefore there's been more sulking and

				tantrums going on because sometimes we can go and sometimes it's a no and I can see how that's harder to understand." – P5 (mother, one child)
	Missing childcare	Childcare increased pressures on parents; anxieties around delays for social development, and the importance of visiting relatives	11	"His attitude towards them [extended relatives] is different, so he won't accept being disciplined by them. He doesn't particularly want much attention from them. He'll still choose me over them, whereas he used to be quite happy to go off with any of my family and leave me behind and not worry about it. So, I think that we, my son and I, have got closer during lockdown, but almost at the detriment of his relationships with everybody else which is a shame. But, I hope it'll get a bit better." – P7 (mother, one child) "It's—now we're sort of gone through lockdown, my mum has sort of been looking after her and that has a massive impact on my relationship and how we are together, like how I view her, because I've got time away as well. And you can have that little break and come back to it and you're like oh my gosh I've missed you so much! These are all the things I love about you! And it's just so nice to get" – P8 (mother, two children)
Gains	It's the little things	Simple pleasures become important when there are few pleasures; pressure eased by home working	7	"We've enjoyed baking. Just being together as a family. I think COVID's really helped in the kind of simple pleasures and the simple joys of just appreciating on a child's level maybe, which is often quite tricky in a busy life—COVID's given us a chance to calm down a bit and have a reset." – P2 (mother, one child)

				"We've had a couple of little sleep overs [with each other, during lockdown], which is her favourite activity at the moment, and really cute...So, she'll only go to bed about an hour later than she normally would, but it's so special for her because there's so few things we can do that's really nice." – P10 (mother, two children)
	Empathy	Empathy of children to increased stress and anxiety noted	6	"The other day when he saw me, he saw me crying because I at some point I had enough, I was too overwhelmed with work, and he comes to me and says—he gives me a cuddle and says—"Mummy, I'm here". Like the same way that I do when he is upset, and I'll go "I'm here, I'm here. It's not ok, but it will be ok", and he kind of did the same actually, and it was so sweet. He is a good boy." – P1 (mother, one child) "He has been really good since I was poorly last week, and he likes to pretend to be a doctor. So he'll come along with his toys and he'll go, "open your mouth" and check me out, and he's really caring— finishes it off with a sticker for being a good girl, and off he goes again." – P7 (mother, one child)
Easing of restrictions	Transition	Transition from lockdown to "normal life" difficult, especially in relation to childcare.	7	"I think that perhaps we're all a little bit apprehensive of the school start, and things are about to change again after like a long period where we've just all been together. And, you know, I think in the last couple of days I've realised how nice it's been. But it's also been really hard." – P8 (mother, two children)

		Children's resilience and adaptability notable.	11	"He's just been coping really well, and he's not going to go back to nursery before school, and he's coped really well with that." – P9 (mother, two children)
	Developing in Lockdown	Children developed immensely over lockdown—noticeably on recontact with relatives	10	"I noticed him as a bigger boy. We travelled for a holiday and then we met my parents and—that we didn't see in the last year—so I could notice a lot of difference in his behaviour and relationships with other adults. I'm very glad because he seems more polite, he seems more patient with things, he seems more careful with his Grandpa. In that same time, I felt a bit like the time is passing by quickly—that's always a little bit emotional." – P9 (mother, two children

4.6 Discussion

Mindfulness has been demonstrated to improve emotion regulation and stress management, and has been used in parenting interventions to interrupt negative parent-child cycles, in order to improve both parent (stress) and child (adjustment) outcomes (Parent et al., 2016). However, as demonstrated in Project 1 (see Chapter 3), there is a lack of literature investigating digital MBIs, arguably of particular relevance since the COVID-19 pandemic has negatively impacted access to health care services for non-emergency care (Reed et al., 2022). Promisingly, digital MBIs have been demonstrated to have comparable effects for reducing stress in general population samples when compared with in-person mindfulness sessions (Taylor et al., 2021). This study aimed to add to the existing literature by investigating the use of a self-directed mindfulness-based app, *Headspace*, in a low-risk—i.e., well-educated, socio-economically advantaged—UK sample.

The results provide preliminary qualitative evidence that parents found using *Headspace* to be both feasible and acceptable. Parents also perceived a positive impact of learning mindfulness on their emotion regulation skills and stress tolerance. These results are discussed in terms of the utility of *Headspace*, but arguably of greatest interest is that the nature and timing of data collection, whilst negatively impacting the study plans, provided key insights into life for low-risk families at an unsettled time in the UK due to COVID-19. The novel insights gained from this data are important for understanding the impact of COVID-19 and associated restrictions on families who may not have been classified as vulnerable prior to the pandemic (Galea et al., 2020). However, these insights are discussed in the context of assertions that, for socio-economically disadvantaged children and their parents, the risk of adverse consequences are likely to be far greater (Lally & Bermingham, 2020).

4.6.1 Findings in context

It is encouraging for the aims of this thesis that parent perceptions of effectiveness, and adherence to, *Headspace*, were almost universally good in this sample. However, this is noted with the understanding that these are very preliminary findings in need of replication with robust study designs and larger, more diverse samples. Importantly caution in generalising is advisable, not only in light of the privileged and self-selecting sample, but also because participants had multiple contacts with the researcher which may have positively influenced intervention effects and app adherence (Gál et al., 2021). Nonetheless, these findings offer some support for previous assertions that digital MBIs can have beneficial effects on parental stress (Potharst et al., 2019), as well as for the suggestion that hypothetical acceptability of digital interventions may be lower than actual acceptability (Berry et al., 2016). These findings may also hint at the potential utility of remote MBIs in the post-pandemic era, although it is important to be mindful that the nature of the sample provided the requisite cultural and financial capital supporting greater adherence to self-directed interventions (Schüz et al., 2021). As such, this study emphasises the importance of robust testing of *Headspace* with a more diverse sample of parents to better understand its effects in a more pragmatic context.

4.6.2 Research implications - mechanisms of action

One of the mechanisms by which mindfulness is thought to improve family functioning is via a non-judgemental, present-moment awareness of the self and child, such an awareness allowing parents to recognise the distinction between perception and affective response (Dumas, 2005). It is therefore interesting that, after using *Headspace,* parents in this sample specifically spoke about appreciating "the little things", and their perceptions of the value this perspective added to interactions with their child. This is supported by previous research

suggesting a dispositional capacity to maintain a focus on the present is associated with reductions in parental coercion and improvements in parental warmth (Parent et al., 2016). This present-moment focus may also go further and be indirectly related to improvements in parenting and family functioning by reducing impulsivity, improving marital and coparenting relationships and depressive symptoms (Bögels et al., 2014).

It was, however, difficult to tease apart the effects of the *Headspace* sleep content from the mindfulness content in this sample as half the participants used both, and many participants reported incidentally finding the mindfulness content to be a sleep aid. This was reported both as parents experiencing better-quality sleep due to improvements in emotion regulation after practising mindfulness, and as an incidental aid to sleep whereby parents fell asleep during the exercise as they found it very soothing. This is of note in terms of the feasibility of *Headspace* as an intervention for parents, because, in this study, parents often commented on a lack of time being one of the biggest barriers to using the app on a daily basis. As such, many parents here found it most feasible to use the app at night, once their children were asleep. If this is the case for parents more broadly, the effects of *Headspace* on sleep are perhaps of particular interest.

If replicated, this may be of importance since evidence suggests practising mindfulness is itself associated with improved sleep and decreased sleep-interfering cognitive processes such as rumination (Shallcross et al., 2019). However, this evidence is heterogenous and limited in parenting populations (Shallcross et al., 2019). Furthermore, in terms of the different types of content parents accessed at night on the app, the sleep content of *Headspace*, whilst informed by mindfulness, is more relaxation focussed and does not constitute mindfulness practice. As such, more research is required to investigate the mediators and moderators of the effects anticipated following a mindfulness intervention for

parents of young children (Dimidjian & Segal, 2015). Specifically, the inclusion of measures of sleep as well as dispositional mindfulness may help to better understand the mechanism by which parents experienced improvements in their sleep.

4.6.3 COVID-19 and 'low-risk' family life

Despite parent perceptions of the benefits of using *Headspace* as part of this study, the effects reported are difficult to tease apart from the effects of COVID-19 restrictions. For example, COVID-19 has been demonstrated to have deleterious effects on the quality of sleep of both parents (Peltz et al., 2023) and children (Bruni et al., 2022), with potential bi-directional effects (Richter et al., 2023). In this study, the relative freedom from earlier restrictions towards the end of the study may have latently improved parents' sleep, as well as allowed them to receive help with childcare which may have equally benefitted their stress levels, as using the app may have done. It is significant, however, that this small sample was demographically homogenous and socio-economically advantaged (e.g., none of the parents reported economic loss ensuing from the restrictions), but that these findings still revealed parent perceptions of substantial negative impacts of COVID-19 and associated measures on their family's wellbeing. The reported experiences of increased parenting stress in these families is striking when considered in their low-risk context, since the effects of the pandemic on family life are likely to be highly influenced by socio-economic circumstance: families less economically and socially "well-placed" may be expected to have been faring worse (Mondragon et al., 2021).

Albeit from different sources than those less economically advantaged, and arguably with different severity, more advantaged parents still experience perceptions of difficulties that nevertheless are impactful for families. For example, research with parents from high-

income countries with higher educational attainment has demonstrated that they may spend more time parenting their children than other parents, arguably a function of both more flexible jobs, and societal pressure (Buchanan et al., 2018). These pressures may have been directly exacerbated as a result of the pandemic-induced shift to home working and home schooling, and may therefore be a unique risk factor for families of higher SES. Although it is likely that pandemic-related difficulties faced by low-risk families may be more transitory than those at higher-risk, due to the greater personal, financial, and social resources available to them (Abel, 2008).

In this sample, the far-reaching effects of COVID-19 restrictions on family life apparent even in these low-risk families were most often reported to relate to sleep difficulties (of the parent or child). Importantly for stress management, previous research suggests a lower quality of parental sleep is associated with higher levels of stress, as well as less observed positive parenting (McQuillan et al., 2019). Although it is not possible to determine from this study, it may not be unreasonable to theorise that potential *Headspace*-induced improvements in sleep (as well as mindfulness, as discussed above) may have the potential to reduce parental stress and increase positive parenting, in turn potentially improving child adjustment outcomes.

4.6.4 Strengths and limitations

Whilst this study offers evidence that the use of *Headspace* to manage parental stress was both acceptable and feasible for parents of young children in this sample, there are significant limitations to the findings. In addition to the aforementioned effects of data collection timing and the low-risk, privileged nature of the sample, all of which limit generalisability, participants used the app in a variety of different ways, accessing content in

addition to the “Basics” mindfulness packages they were directed to use. It was therefore difficult to ascertain what parts of the app, if any, were responsible for reported stress reductions. Moreover, while qualitative work is an essential step in evaluating the effectiveness of a novel intervention (Kooistra et al., 2009), the limitations of the design in conjunction with COVID-19 induced study limitations are acknowledged. Although assessments of inter-coder reliability were not conducted due to the epistemological position taken on the interpretative nature of the analysis (i.e., a reflexive thematic analysis was conducted, consist with social constructionist thought; Braun & Clarke, 2006; Zelčāne & Pipere, 2023), it is acknowledged that other best practice guidelines for ensuring the robustness of qualitative research, such as member checking, were also not conducted and this forms a significant limitation of the work. As such, while it may be posited that these results provide initial support for the theoretical promise of *Headspace* for reducing parental stress and in turn improving children’s outcomes, more robust and diverse research in this area is needed. Further qualitative work in particular would be particularly value, but this study has acted as a springboard for what was planned to be a more rigorous, well-powered, internal pilot randomised controlled trial.

4.6.5 Conclusion and implications

COVID-19 is likely to have long-lasting and wide-spread impacts on the availability of preventative physical and mental health care whilst health services recover from emergency-orientated care (Barnett et al., 2020). Previously, mindfulness has been demonstrated to be beneficial for both parent and child outcomes, via reductions in stress and improvements in emotion regulation (Burgdorf et al., 2019; Parent et al., 2016). Here, preliminary support is provided for the acceptability, feasibility, and utility of a digital, self-directed MBI for parents experiencing stress. It should be a priority, however, to build on the current findings in diverse

families, but particularly families who were vulnerable before the pandemic and who are now significantly more at risk (Holmes et al., 2020). In addition, the potential significance of the relationship between sleep and mindfulness in family dynamics and wellbeing has been highlighted. If this relationship stands to more robust scrutiny, it may be the case that mindfulness-based apps, such as *Headspace*, may prove to be accessible, inexpensive, and potentially useful self-directed interventions for parental stress and ultimately child well-being and mental health for diverse families.

CHAPTER 5

Quantitative report on the feasibility, acceptability, and initial effects of *Headspace* for parents

5.1 COVID-19 Context

As previously stated, the qualitative data collected as part of the original mixed methods feasibility study for Project 2 was published separately to give a timely indication of parents' experiences during the initial phase of the pandemic in 2020. Here, the quantitative data collected as part of the same project is presented. This data has been reported in this chapter not because it is intended to reflect any useful measure of the effectiveness of the *Headspace* app, but because it did contribute significantly to the planning of Project 3 (an internal pilot RCT). It contributed in multiple ways, including planning for recruitment, and understanding the feasibility and acceptability of the measures and sequencing of events in the study, as well gaining an insight into how and when parents used the app.

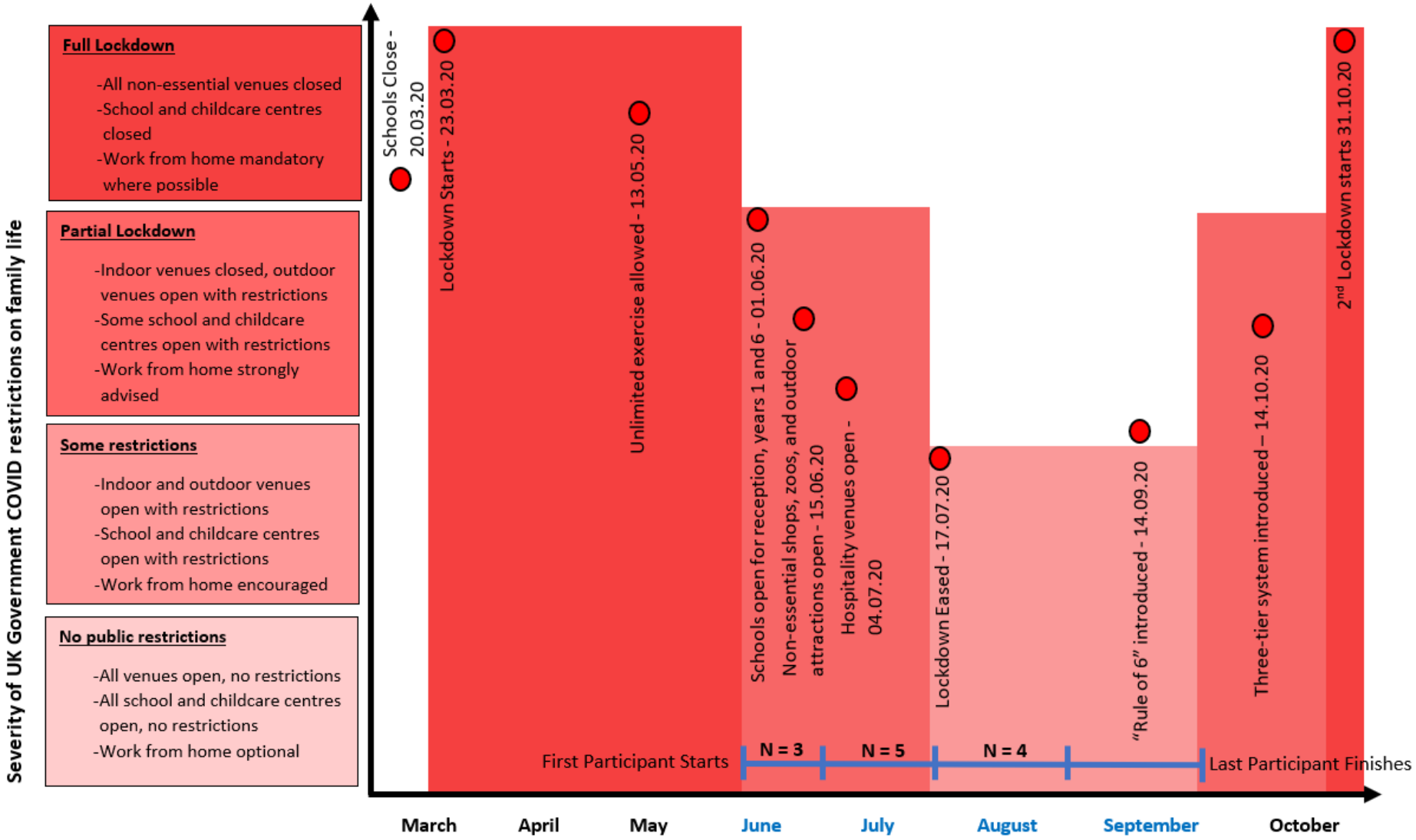
However, the work that is contained in this chapter was subject to the same COVID-19 context as that reported for the qualitative results in Chapter 4, which rendered it uninterpretable for the originally intended purpose. To briefly summarise, the original plans for this study did not take into account the impact of COVID-19 on family life, or on research processes, because it was planned before COVID-19 lockdowns became a reality. In the event, lockdowns were entirely unprecedented and there was little evidence about their effects outside of controlling the virus, and little certainty of what the immediate future may look like (Duffy et al., 2020; Plümper & Neumayer, 2022). Therefore, this chapter should be

considered in light of the uncertainty of the time, and the resulting issues with data collection and analysis. Figure 5.1 (as in Chapter 4) presents the general nature of restrictions in the UK starting with the first lockdown, and continuing through the data collection period for this study, with the corresponding number of participants recruited in each month.

In terms of the analysis, only one element of the data collected that was analysed qualitatively in Chapter 4 is also presented here—the FMSS. However, the transcripts in Chapter 4 were coded specifically to understand parents' experiences of lockdowns and the subsequent restrictions in place during data collection. Here, the FMSS have been quantitatively coded for expressed emotion. This is an entirely separate method of analysis which examines different elements of the data and has been used to address different research questions. In the first instance, the research question was centred around what parents' experiences were during COVID-19, here the research question being answered is how did parents' expressed emotion about their child (i.e., positive, negative, or neutral ways of speaking about their child) change from pre- to post- intervention. This is consistent with the UK Data Service's (2023) advice on when it can be appropriate to reanalyse qualitative data, i.e., that any reanalysis should ask new questions of the data and make different interpretations from the original analysis, approaching the data in a way that was not originally done. However, it is acknowledged that whilst the FMSS coding for expressed emotion was conducted by a different researcher (independent of both the project, the University of Sussex, and UCL), it is the same researcher asking the two different questions of the data, and this should be borne in mind when considering the findings.

Figure 5.1

Impact of COVID-19 restrictions in the UK on planning and recruitment for Project 2



Note: This visualisation of the different stages of lockdown restrictions in the UK in 2020 uses the dates of family-specific significant restrictions recorded by the Health Foundation's COVID-19 Policy Tracker (2021), and the Institute for Government's timeline of UK government coronavirus lockdowns and restrictions (2022).

5.2 Abstract

Common mental health problems in children, such as conduct disorders, are thought in part to be driven by harsh parenting styles, which in turn are seen to be driven and exacerbated by stress. Mindfulness has been demonstrated to improve stress management and emotion regulation when delivered to parents in-person, however, more accessible digital interventions are under-researched. This study aimed to provide preliminary data on the feasibility and effectiveness of giving the *Headspace* app—a mindfulness-based, self-directed intervention—to parents to improve children's wellbeing via reductions in parental stress. 12 parents were given access to *Headspace*, and both qualitative (semi-structured interviews and pre- and post- five-minute speech samples (FMSS)), and quantitative data (questionnaires and app usage) were collected immediately following the first COVID-19 lockdowns in the UK. Here, the quantitative data is reported—FMSS transcripts were coded for Expressed Emotion (EE), and pre- post- questionnaire data compared. Results suggest that parental use of *Headspace* is feasible, and small improvements were found in mindfulness, with reductions in stress, anxiety, depression, and improvements in emotion regulation and EE about the target child. However, these findings should be considered in light of the qualitative work, where changes related to COVID-19 lockdowns were also reported. Due to the confounding impacts of COVID-19, and varied access to app content, it is not possible to confidently attribute the improvements measured to parents using the *Headspace* app. Nonetheless, most participants adhered to most of the study procedures very closely, and also reported improvements in the parent-child relationship, as well as their own wellbeing pre- to post- intervention. It may therefore be beneficial to test the app using a more rigorous, randomised and controlled design.

5.3 Introduction

Mindfulness has been demonstrated to improve perceptions of stress, and stress in parenting has been associated with children's adjustment problems (Duncan et al., 2009). The "what" of mindfulness can be described as "openly attending, with awareness, to one's present moment experience" (Creswell, 2017, p. 493), which can be operationalised as the "how" by teaching individuals to intentionally notice and accept experiences (e.g., thoughts, feelings, sounds, sights, and sensations) as they are when they arise (Quaglia et al., 2015). Mindfulness can be thought of as a skill to practice (Kabat-Zinn, 2003), which has become increasingly popular in the West as a potentially effective, secular, and accessible method to improve well-being (Shapiro & Weisbaum, 2020). This popularity has encouraged the proliferation of MBIs, such as MBSR and MBCT, which have been usefully applied in diverse clinical and non-clinical populations to improve a range of psychological outcomes, including notably stress reduction (Crane et al., 2017).

Most MBIs are delivered in-person, and of those adapted for the parenting context, most are based on an MBSR or MBCT framework (Burgdorf et al., 2019). However, much of the literature investigating the effects of MBIs for parents is of poor quality (Burgdorf et al., 2019). There is also a notable lack of evidence to support the use of self-directed digital mindfulness interventions in parent populations, despite recent qualitative work suggesting that digital MBIs provide parents with much appreciated flexibility, including time saved travelling to and from sessions (Burgess et al., 2022; Wisen-Vincent & Bokoch, 2023). This study therefore aimed to expand the evidence base by utilising a mindfulness-based smartphone app (*Headspace*) to improve perceptions of stress for parents of young children.

Here, the quantitative results of a small, mixed-methods feasibility study are reported—the qualitative results of which have been described previously in Chapter 4.

5.3.1 Parental stress and mindfulness

Parenting stress is thought to be a significant driver of children's adjustment problems by contributing to harsher parenting behaviours which in turn have a negative effect on children's behaviours (Carapito et al., 2020). The psychological experience of "stress" is the discrepancy between perceived demands and abilities to cope with them, and is thought to be role-specific, determined from the continuous interaction between a person and their environment (Lazarus & Folkman, 1984). Parenting stress has been studied in a variety of contexts, with both mothers and fathers, as well as children of all ages (Deater-Deckard, 1998; Deater-Deckard & Scarr, 1996; Esdaile & Greenwood, 2003; Golfenshtein et al., 2016; Huizink et al., 2017; McBride et al., 2002), and has been causally related to poor parenting (Deater-Deckard, 1998). Central to the definition of parenting stress is a parent's perception. Both perception of their available resources, and perception of the demands placed on them as a parent (Deater-Deckard, 1998). Influencing perception is therefore one avenue for reducing parenting stress, and is a key mechanism in the proposed action of mindfulness in parenting (Parent et al., 2016).

5.3.2 Mindfulness in parenting

Mindfulness was first applied in Western science as a fundamental skill for parents by Kabat-Zinn and Kabat-Zinn (1997), and it continues to gain ground as a secular tool for improving wellbeing. When discussing mindfulness as an intervention it is important to differentiate parental mindfulness and dispositional mindfulness. Dispositional mindfulness

can be understood as a cognitive characteristic distinguishing perception from affective responses (Parent et al., 2016), whereas mindful parenting, or parental mindfulness, applies this characteristic to the focal point of the social relationship between the parent and child specifically (Kil, 2018). When delivered to parents, MBIs are most often in the form of in-person, professionally-led courses (Burgdorf et al., 2019), which aim to teach mindful parenting specifically. Whilst mindful parenting and dispositional mindfulness are related constructs (Kil, 2018), arguably the most accessible interventions (self-directed, commercially available apps) focus on improving dispositional mindfulness more broadly rather than teaching mindful parenting skills specifically.

Whether aimed at increasing dispositional mindfulness, or centered on the parent-child relationship, MBIs are theorised to improve self-reported perceptions of the parent-child relationship via improvements in stress management and emotion regulation (Parent et al., 2016). Rigid patterns of conflict-inducing parent-child behaviour can become automatic and negatively reinforcing, where mindfulness is proposed to reduce conflict via the interruption of these cycles (Dumas, 2005). However, the literature supporting mindfulness in parenting is of variable quality and has produced mixed outcomes with homogenous groups of participants—mostly investigating its effects for mothers of neurodivergent sons (Burgdorf et al., 2019). There are also wide variations in the type of interventions delivered, both in-person and remotely, delivered to parents only or to parents and children in parallel (Burgdorf et al., 2019). Whilst the meta-analysis reported in Chapter 3 found a greater effects on parenting stress for parent only interventions (g = 0.35) in comparison to parallel parent-child interventions (g = 0.18), there is little research available testing online interventions, specifically the utility of self-directed apps for reducing parents' stress.

5.3.3 Digital, self-directed MBIs

Self-directed digital MBIs are increasingly popular, particularly in non-clinical settings, as they may be considered both more accessible and cost-effective than in-person approaches, particularly post-COVID-19 (Zhiyu et al., 2022). Despite this, there is a lack of research investigating the use of a mindfulness app with parents of young children (Burgess et al., 2022). Previous parent-specific studies (Padgett, 2020; Potharst et al., 2019) have investigated the delivery of professional-led mindfulness programmes for parents adapted to a remote delivery format, rather than the use of a self-directed commercially available app. More broadly, research using mindfulness apps raises concerns in non-clinical populations around effectiveness and poor engagement (Renfrew et al., 2020), which are challenging to overcome when using self-directed interventions.

Headspace is, however, one of the most widely researched commercially available mindfulness-based apps, with a growing evidence base to support its use in the general population (Lau et al., 2020). It has been demonstrated to improve self-reported satisfaction with life, stress, and resilience in adults (Champion et al., 2018), as well as potentially improving concentration by reducing mind-wandering (Bennike et al., 2022), increasing compassion for others (Lim et al., 2015) and reducing aggressive responses to provocation (DeSteno et al., 2018). There is, however, a lack of research using *Headspace* with parents. The only other published research available investigated the feasibility of the app for stress regulation among parents and reported that 100% of participants found the app helpful (Militello et al., 2022). However, this micro-randomised trial was both very small (N = 10) and focused on difficulties with recruitment and retention, and therefore does not speak to the effectiveness of *Headspace* for stress reduction in parents (Militello et al., 2022).

Research using another mindfulness-based app (*Smiling Mind*) with parents of children with Autism similarly highlighted recruitment, retention, and engagement with the app as a consistent problem (Hartley et al., 2022), and did not explicitly report effects on wellbeing outcomes. Only two studies have reported effects of mindfulness apps on parental outcomes. One, a pre-COVID-19 study (published post-pandemic) with new mothers of children under 12 months old suggested that *Smiling Mind* decreased depression, anxiety, and stress levels in comparison to a control group but did not report effect sizes (Bear et al., 2022). The other, a small (N = 27) unpublished doctoral study investigating the effects of the *Calm* app on stress among foster parents, did not find any significant effects of the app (Loree, 2018).

However, given promising findings in general population samples, *Headspace* retains promise as an accessible and potentially useful MBI for parents. In particular for parents of younger children for whom engaging in parenting interventions can be inaccessible due to the cost and pragmatics of attendance at in-person sessions (Hall & Bierman, 2015). Accessibility issues, and the need for support, may also have been exacerbated by the recent social, economic and psychological changes associated with COVID-19, including increases in children's adjustment problems and parents' anxiety and depression (Feinberg et al., 2022), as well as a drop in the UK's Gross Domestic Product not seen since ONS measurements began in 1955 (ONS, 2023a). As the narrative synthesis in the previous chapter demonstrates, parents engaging in a remote MBI during the early stages of the pandemic reported that they appreciated the accessibility of digital sessions (Burgess et al., 2022; Wisen-Vincent & Bokoch, 2023), and some authors highlighted this effect was most notable for parents who lived furthest away from the campus the intervention was intended to be delivered at (Wisen-Vincent & Bokoch, 2023). Some parents also reported MBIs as useful for helping them cope

with pandemic-related distress (Burgess et al., 2022; Maher, 2021). Combined, these issues highlight the relevancy of delivering mindfulness to parents remotely via a widely accessible, commercially available, smart phone app.

5.3.4 The current study

Although *Headspace* is the most widely researched mindfulness-based app, its effectiveness has not been tested with parents. More broadly, there is a lack of research investigating digital MBIs with parents. Digital MBIs, and *Headspace* in particular, have been demonstrated to reduce stress in more general populations (Lau et al., 2020). Given the relationship between parenting stress, parenting practices, and parent-child relationships (Deater-Deckard, 1998), it has been hypothesised that helping parents to manage their stress may consequently improve their children's wellbeing (Parent et al., 2016). Therefore, due to its promise, but the lack of literature investigating it with parents, the aim of this study was to understand the initial feasibility and acceptability of using *Headspace* to manage stress for parents of young children.

The aspects of feasibility and acceptability of interest here may be usefully separated into five distinct categories: i) feasibility of recruitment to the study; ii) feasibility of study procedures (i.e., completion of outcome measures); iii) feasibility of the intervention (i.e., app usage); iv) preliminary pre-post outcome effects; and v) participant experience (both of using the app, and taking part in the study). The qualitative data collected and reported in Chapter 4 was intended to address the fifth category by answering the research question, what are parents of young children's perceptions and experiences of using a self-directed mindfulness app to manage their stress, in relation to their experiences of being a parent? The quantitative

data reported here, therefore, was intended to address the other feasibility issues of interest by answering the following research questions:

1. Is it feasible to recruit parents of children aged 2-5 years old to take part in a research study where they engage in daily mindfulness practice using a 30-day introductory programme on the *Headspace* app?
2. Is it feasible to retain parents to the study procedures (i.e., pre-, post-, and follow up measures)?
3. How closely do parents of 2–5-year-old children adhere to daily use of the *Headspace* app for the duration of a 30-day intervention?
4. Does using the *Headspace* app for 30 days improve parents' wellbeing—specifically, their mindfulness, stress, depression, anxiety, and the relationship they have with their child?
5. Does parental use of the *Headspace* app for 30 days improve their children's outcomes—both internalising and externalising problems?

5.4 Methods

5.4.1 Design and ethics

A mixed methods sequential explanatory design (Creswell et al., 2003) was employed for this feasibility study. Here, the quantitative data are reported; pre- and post- intervention questionnaires, app usage data from Headspace, and pre-post five-minute speech samples (FMSS) coded for Expressed Emotion (EE). Ethical approval was granted by the Department of Psychology at Goldsmiths, University of London (Ethics Committee Approval: PS080120ABS). Written, informed consent was obtained from all participants.

5.4.2 Participants

12 parents aged between 35 and 46 years old (M 42, SD 3.68) were recruited via social media (Twitter and Facebook), utilising snowball sampling. Inclusion criteria were defined as being the parent of at least one child aged between 2-5 years old, being usually resident in the UK, at least 18 years old, fluent in English and not having regularly practised (at least once per week for one month) meditation or used the *Headspace* app in the last 6 months. Participants were excluded if they were parents of twins, or if either they or their child had a diagnosed neurodevelopmental or mental health condition. Only one parent per family took part.

5.4.3 Procedure

Parents registered their interest in the study online, and, if eligible, were emailed the information sheet (see Appendices B and C), a link to the pre-intervention questionnaire, and were asked to schedule a phone or video call for the pre-intervention FMSS. After the call, participants were provided with a code and instructions to access *Headspace* (Appendix D). Participants were then emailed 30-days later to complete the post-intervention questionnaire and to arrange another phone call for the post-intervention FMSS. Two weeks later, the final questionnaire was emailed, and participants were invited to take part in a semi-structured interview. On completion, participants received a digital voucher worth £15.

5.4.4 Measures

Demographic details were collected in the pre-intervention questionnaire, including parent, target child and sibling age, gender, ethnicity, and parent marital status, and employment status. Objective app usage data (i.e., type and duration of content, and day and

time of access) was collected via study-specific codes, which gave participants free access to the app for the duration of the study.

Mindfulness. Parents were asked to fill out the short form Five Facet Mindfulness Questionnaire (FFMQ-15; Baer et al., 2008) as part of the pre-, post-, and follow up online questionnaire. This 15-item questionnaire is a short form of the original 39-item FFMQ, utilising a 5-point Likert scale, from 1 (never or very rarely true) to 5 (very often or always true). It measures the following five facets of mindfulness: Observing, Describing, Acting with Awareness, Non-Judging of Inner Experience, and Non-Reactivity to Inner Experience, with 3 questions relating to each facet. A total score was achieved by summing all 15 items, where items 3, 4, 7, 8, 9, 13, and 14 were reverse scored. The FFMQ-15 was used because this questionnaire has benefited from improvements on original mindfulness measures such as the Mindful Attention Awareness Scale (Brown & Ryan, 2003), and is in widespread use within the broader mindfulness literature allowing greater comparability of results. Good internal consistency was demonstrated in this sample, with a Cronbach's alpha of .78 for the total scale.

Parental Stress and Wellbeing. The Depression, Anxiety and Stress Scale - 21 Items for adults (DASS-21; Lovibond & Lovibond, 1995) was used as a measure of parents' general stress and wellbeing. It is comprised of 3 subscales, containing 7 items each, measured on a 4-point Likert scale from 0 (Did not apply to me at all) to 3 (Applied to me very much or most of the time). The stress subscale is reported to be sensitive to chronic non-specific arousal, including difficulty relaxing, nervous arousal, being easily upset, and impatient (Lovibond & Lovibond, 1995). Each subscale score is achieved by summing the 7 items and multiplying by 2 for comparability to the 42-item DASS questionnaire. Scores below 10 for depression, below 7

for anxiety, and below 14 for stress are thought to be “normal”, and scores between 21-27 for depression, 15-19 for anxiety, and 26-33 for stress are thought to be “severe”. Good internal consistency was demonstrated in this sample for the Stress (alpha .76) and Depression (alpha .85) subscales, however, an alpha of .52 was found for the Anxiety subscale.

The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) was used to further explore the relationship between mindfulness and parents’ stress. It measures two forms of emotion regulation, cognitive reappraisal and expressive suppression, with 10 items using a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Six of these items (1, 3, 5, 7, 8, 10) comprise the Cognitive Reappraisal subscale, and the remaining four comprise the Expressive Suppression subscale, which are both summed respectively. This scale was used because the cognitive reappraisal element is particularly pertinent to the proposed mechanism of action of mindfulness on improving the parent-child relationship (Duncan et al., 2009). In this sample, a Cronbach’s alpha was found of .84, and .61 for the Cognitive Reappraisal and Expressive Suppression subscales respectively.

Parenting. The Parental Stress Scale (PSS; Berry & Jones, 1995) and the Parenting Daily Hassles Scale (PDHS) (Crnic & Booth, 1991; Crnic & Greenberg, 1990) were both used as a measure of parenting specific stress. The PSS is comprised of 18 items, each measured on a 5-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree). Items 1, 2, 5, 6, 7, 8, 17, and 18 are reversed scored. All 18 items are summed to provide a total score, whereby higher scores indicate greater stress. In this sample, a Cronbach’s alpha of .90 was found. The Parenting Daily Hassles Scale (PDHS; Crnic & Greenberg, 1990) aims to assess the frequency and impact of experiences that frustrate parents, and has been used in social work to identify areas of specific stress as well as being used to monitor change (Smith, 2011). It is comprised

of 20 items, measuring frequency on a 4-point Likert scale from 1 (rarely) to 4 (constantly) which are summed to provide a score between 0-80, and intensity by a numerical 1-5 scale which is summed to provide a score between 0-100. Excellent internal consistency was also found in this sample, with a Cronbach's alpha of .90.

The short form Child-Parent Relationship Scale (CPRS; Pianta, 1992) is a 15-item scale used to assess the parents' perception of their relationship with their child. Each item is measured using a 5-point Likert scale from 1 (Definitely does not apply) to 5 (Definitely applies), and includes two subscales: conflict (8 items) and closeness (7 items). This scale has been well validated in the preschool age group in particular (Simkiss et al., 2013; Ulutas & Kanak, 2016; Zhang & Chen, 2010). Good internal consistency was demonstrated in this sample for the conflict subscale with a Cronbach's alpha of .72, however, an alpha of only .54 was found for the closeness subscale.

Expressed Emotion. To assess the parent-child relationship in terms of expressed emotion (EE) from the parents about the child, parents were asked to participate in a FMSS (Gottschalk & Gleser, 1979), collected pre- and post- intervention. Participants were telephoned and asked to talk for five minutes uninterrupted, answering the following prompt: "Please tell me what you've been thinking and feeling about (your child) in the past two weeks. What has your relationship with (your child) been like, and how well have you gotten along with them in the last two weeks?". The EE coding system was applied to the data, which classifies relationships into either positive, negative, or neutral categories, as well as including counts of criticism and positive remarks, and displays of emotional overinvolvement. When interpreting global ratings, high EE has been found to be reflective of more rigid, conflict-prone relationships, characterised by negative emotional atmospheres (Hubschmid et al.,

1989). In contrast, low EE has been associated with caregivers being less critical, more emotionally positive, and more supportive (Hubschmid et al., 1989).

Children's Mental Health and Wellbeing. The Eyberg Child Behaviour Inventory (ECBI; Eyberg & Pincus, 1999) was used to measure children's behaviour problems. It is comprised of an intensity scale and a problem scale, of which, only the intensity scale was used here. This was scored by summing the selected scores in the "How often does it occur?" column, which are comprised of a 7-point Likert scale ranging from 1 (Never) to 7 (Always). Good internal consistency was found in this sample with a Cronbach's alpha of .89.

The Social Competence Scale (SCS; Corrigan, 2002) was administered to assess parent report of children's prosocial behaviours, communication, and self-control. It is comprised of 12 items, each describing behaviours occurring when children socialise, measured using a 5-point Likert scale ranging from 0 (Not at all) to 4 (Very Well). There are two subscales, prosocial behaviours/communication skills and emotion regulation skills. This scale was used to measure children's emotion regulation, concurrent to measuring their parents using the ERQ (Gross & John, 2003). In this sample poor internal consistency was found, with the prosocial behaviour subscale having an alpha of .62, and the emotion regulation subscale an alpha of .15.

5.4.5 Intervention

Headspace is a commercially available app which incorporates a variety of meditative and non-meditative content focused on well-being, based on mindfulness principles. In this study, participants were asked to complete the "Basics" packages 1, 2 and 3. These packages form a 30-day introduction to mindfulness, which consists of short sessions designed to be used daily to teach beginner-level meditation skills. At the time of data collection, the app

allowed for slight variations in the length of sessions available to participants. In the first 10 days (Basics 1), participants could choose for sessions to be either 3, 5, or 10 minutes long. The next 20 sessions then build on this, and when using Basics 2 and 3, participants could choose between either 10 or 15-minute sessions. When given access to the app, participants were asked to use it every day for 30 days until the three Basics packages were complete, but no specification was given for the duration of meditation chosen, and no strict limitations were placed on their exploring the rest of the app. Participant instructions are available in Appendix D.

5.4.6 Data analysis plan

Descriptive analysis was planned to assess feasibility and acceptability, in answer to the five research questions which were operationalised as follows:

Recruitment feasibility was identified as enough parents of 2–5-year-old children being sufficiently interested in the study to take part within 6 months of data collection having started. As this study was intended to be a small mixed methods feasibility, the target for participant recruitment was small (N = 12) to facilitate both qualitative and quantitative data analysis, and 6 months was allocated in the overarching thesis timeline as being sufficient for data collection to be completed for this study to allow time for Project 3 to be completed. To analyse recruitment feasibility, numbers of participants recruited were recorded and compared with the target (N = 12).

Retention feasibility for the study procedures was identified as all 12 participants having completed all qualitative elements of data collection, and at least 80% of participants having completed pre- and post- quantitative measures, because a loss of more than 20% of participants to follow up measures is generally accepted to cast doubt on the feasibility of a

potential trial (Fewtrell et al., 2008). Retention to all qualitative elements of the study was aimed for because it was deemed important to be able to gather the views of all 12 participants regardless of whether they completed study measures, and/or used the app as directed, in order to better understand barriers and facilitators to participation and app use to improve future studies.

To better understand retention to study procedures, differences between study completers and non-completers at baseline were considered. Means and standard deviations are presented, and Hedge's *g* was calculated (with corresponding 95% confidence intervals) using the baseline means and standard deviations to assess differences between participants who completed the study and participants who did not complete the study (Hedges & Olkin, 1985). Hedge's *g* was used as this is particularly small sample, for which the procedure is thought to be less biased than Cohen's *d* (Lakens, 2013). Hedge's *g* effect size can be interpreted such that .2 indicates a small effect, .5 a medium effect, and .8 or greater, a large effect (Cohen, 1992). For more details on the formula used to calculate Hedge's *g*, see section 6.4.7 in Chapter 6.

Retention to the intervention was identified as participants having completed at least one element (one Basics package, lasting 10 days) of the 30 days they were requested to do, measured by objective app usage data collected by *Headspace.* Little was known at the time of this study about using *Headspace* with parents as this was a novel population for the app, and therefore adherence to at least one element of the proposed intervention was deemed to be a useful benchmark to assess retention to the intervention. Retention to the intervention was analysed using descriptive statistics, presenting app usage data (means and

standard deviations) according to total use of the app as well as the different types of content accessed.

Preliminary effects on parent and child outcomes. Descriptive comparisons of pre-post questionnaire data (means and standard deviations) were conducted to determine preliminary effects on parent and child outcomes. Effect sizes (Hedge's *g*) and corresponding 95% Confidence Intervals (CIs) for pre-post differences of each outcome measured are also reported. Follow up data collected at 2 weeks was not analysed for effects because it was not intended to be a quantitative data analysis point. Follow up measures were included in part to test the feasibility of a more longitudinal study design for a larger pilot randomised controlled trial, but also to give scope to conduct semi-structured interviews without overwhelming participants' time at post-intervention.

Questionnaire data was collected using Qualtrics software (Qualtrics, 2020), and both questionnaire and EE-coded FMSS data were analysed using IBM SPSS Statistics v28 for Windows. The FMSS audio was transcribed, anonymised, and then coded by a trained, independent researcher, using the EE coding system. The emotional overinvolvement element of coding was not included in the analysis as this is not widely supported in developmental research (Sher-Censor, 2015). Here, differences between pre- and post-intervention have been explored descriptively, using means and standard deviations, in addition to effect sizes (Hedge's *g*) and corresponding 95% CIs, or z-tests of proportion.

5.5 Results

5.5.1 Recruitment

Recruitment was completed over the course of three months, from May to July of 2020. Of the 12 parents who received the Headspace intervention, 11 were White or White British

women, with an average age of 42 years (SD 3.68). Ten were married and living together, and the mean age of target children was 3.42 years (SD 1.08), the majority of whom were male (n = 8, 67%). This sample only included one father, one single mother, and one person who was married but living separately from their spouse. Further demographic details can be found in Table 5.1.

As snowball sampling was used, word of mouth proved very useful for recruiting additional parents (e.g., existing participants' friends/fellow parents at their children's nurseries or schools), and the study proved to be popular. Towards the end of data collection (August-September 2020), a waiting list had to be implemented where parents who wished to take part in the study but were unable to do so due to recruitment targets having been achieved were able to register their interest for the next study (Project 3). Whilst this waiting list was short (≤ 5 parents), it demonstrated that parents were interested in using *Headspace*, and that enough of those who took part enjoyed the study enough to garner further interest.

Table 5.1

Sociodemographic characteristics of participants in Project 2 (N = 12)

Baseline characteristic	Full sample	
	M/n	**SD/%**
Parents		
Age	42.00	3.68
Age at birth of first child	37.00	3.83
Gender (n, %)		
Female	11	92%
Male	1	8%
Ethnicity (n, %)		
White	11	92%
Prefer not to say	1	8%
Marital status (n, %)		
Married living together/cohabiting	10	84%
Married living apart	1	8%
Single	1	8%
Total number of children (n, %)		
One	6	50%
Two	6	50%
Target Child		
Age	3.42	1.08
Gender (n, %)		
Male	8	67%
Female	4	33%
Ethnicity		
White	11	92%
Prefer not to say	1	8%
Sibling		
Age	4	1.45
Gender (n, %)		
Male	3	50%
Female	3	50%
Ethnicity		
White	6	100%

Note. Target child age ranged from 2-5 years old. Frequency % rounded to integer where possible, or first decimal place to sum 100%

5.5.2 Retention to study procedures

All participants completed the qualitative measures at all time points, however, two participants did not complete the post-intervention questionnaires and according to the usage data either did not use the app at all, or only used it once. In terms of understanding retention, these were identified as "non-completers", and their baseline measures were compared with "completers" for descriptive purposes. As a result of the two participants who were lost to quantitative follow up, 83% of participants (n = 10) completed all post-intervention measures.

Although difficult to compare on all measures due to the comparatively small number of non-completers (n = 2), it appears that parents who were lost to quantitative follow up were less dispositionally mindful at baseline (M 2.50, SD .14, compared to M 3.11, SD .31 for completers); more stressed (M 30, SD 5.66, compared to M 18.60, SD 7.95) and depressed (M 25, SD 7.07, compared to M 8.60, SD 6.47), and were more likely to use expressive suppression as an emotion regulation strategy (M 15.50, SD .71, compared to M 10.60, SD 3.44 for completers). They were also demonstrated to have more conflict in their relationship with one of their children (M 31, SD n/a, compared to M 14.25, SD 5.68 for completers), and had a child with more externalising problems (M 147, SD n/a, compared to M 111.69, SD 23.91). More details of the characteristics of these participants are available in Table 5.2.

Table 5.2

Demographics, and parent and child outcomes (where available), comparing parents who completed at least one Basics package (>10 days of the intervention), compared to parents who did not complete at least one Basics package (<10 days of the intervention).

	Non-completers (N = 2)[a]	**Completers (N = 10)**			
Demographics	**M (SD) / N (%)**	**M (SD)/ N (%)**	***g***	**Lower CI**	**Upper CI**
Parent age	44.00 (2.83)	41.00 (2.58)	-1.06	-2.51	.44
Parent gender (female)	2 (100%)	9 (90%)	-	-	-
Parent ethnicity (white)	2 (100%)	9 (90%)	-	-	-
Marital status			-	-	-
Married living together	2 (100%)	8 (80%)			
Married living apart					
Single		1 (10%)			
		1 (10%)			
Employment status					
Employed/self-employed	2 (100%)	10 (100%)	-	-	-
More than one child at home	1 (50%)	4 (40%)	-	-	-
Child age	4.50 (.71)	3.20 (1.03)	-1.19	-2.66	.33

Child gender (male)	2 (100%)	6 (60%)	-	-	-
Child ethnicity (white)	2 (100%)	9 (90%)	-	-	-
Sibling age	2.00 (N/a)	4.50 (3.51)	-	-	-
Sibling gender (male)	0 (0%)	2 (50%)	-	-	-
Sibling ethnicity (white)	1 (100%)	4 (100%)	-	-	-
Children's outcomes					
Target Child Externalising behaviours (ECBI)	117.00 (21.21)	111.30 (22.60)	-.23	-1.63	1.18
Sibling Externalising behaviours (ECBI)	147.00 (N/a)	111.69 (23.91)	-	-	-
Parent outcomes					
Mindfulness (FFMQ15)	2.50 (.14)	3.11 (.31)*	1.90	.24	3.48
General Stress (DASS-21)	30.00 (5.66)	18.60 (7.95)	-1.36	-2.85	.19
Anxiety (DASS-21)	11.00 (4.24)	5.00 (4.83)	-1.16	-2.62	.35
Depression (DASS-21)	25.00 (7.07)	8.60 (6.47)**	-2.32	-4.00	-.56
Emotion Regulation (ERQ - Cognitive Reappraisal)	20.00 (0.00)	23.60 (7.32)	.48	-.95	1.88
Emotion Regulation (ERQ - Expressive Suppression)	15.50 (.71)	10.60 (3.44)*	-1.38	-2.88	.17
Parenting Stress (PSS)	50.50 (2.12)	42.40 (9.78)	-.80	-2.23	.66

Parenting outcomes					
Parenting Daily Hassles (PDH Intensity)	47.00 (5.66)	45.70 (15.45)	-.08	-1.48	1.32
Target Child-parent relationship Conflict (CPRS – higher indicates more conflict)	18.00 (4.24)	19.50 (4.90)	.29	-1.13	1.69
Target Child-parent relationship Closeness (CPRS – higher indicates closer)	29.00 (1.41)	31.40 (2.84)	.81	-.65	2.24
Sibling Child-parent relationship Conflict (CPRS – higher indicates more conflict)	31.00 (N/a)	14.25 (5.68)	-	-	-
Sibling Child-parent relationship Closeness (CPRS – higher indicates closer)	26.00 (N/a)	28.50 (4.51)	-	-	-

Note. Where there was only 1 sibling in the non-completers group, Hedge's *g* was not calculated due to the absence of variance but inspection of the means were used to indicate differences of note between the two groups.

[a]Of the two participants who did not complete at least 10 days of the intervention, one did not register to use the app, and the other completed only one 5-minute session (i.e., 1 day of the intervention).

5.5.3 Retention to the intervention - Headspace usage data

Headspace usage data is summarised in Table 5.3. All 12 participants received codes to use *Headspace*, but only 11 registered the app with the code to provide usage data. One participant who registered only completed one five-minute session, where all other participants (n = 10) completed at least one Basics package (i.e., at least 10 days of the intervention). Among the 10 participants who used the app for at least 10 days, adherence to the intervention was excellent, with parents using the app on average for 26.08 days (SD 11.84) out of the 30 they were requested to use.

In terms of parents who did not use the app for at least 10 days (n = 2), because these parents also did not complete post-intervention measures, the demographic and baseline questionnaire data compared in Table 5.2 demonstrates the differences between the two groups. To summarise again, although no differences were found in demographic characteristics, parents who did not use the app were different in terms of having a potentially more conflict-orientated relationship with a child with more externalising behaviours, as well as reporting less dispositional mindfulness at baseline, more stress, and more depressive symptoms. Parents who did not use the app for at least 10 days also reported more use of expressive suppression as an emotion regulation strategy at baseline, than parents who completed at least one Basics package.

Table 5.3

Descriptive Headspace app usage data (M, SD, range) for all 11 participants who registered use of the app in Project 2, by type of app content used

	Total app use (N=11)			**Mindfulness content (N=11)**			**Sleep content (N=6)**			**Kids content (N=3)**		
	M	SD	Range	*M*	SD	Range	*M*	SD	Range	*M*	SD	Range
Number of intervention days completed[a]	26.08	11.84	1-43									
Number of sessions completed	29.50	18.50	1-60	25.42	14.97	1-49	4.0	9.01	1-29	1.75	1.27	1-4
Duration (hours)[b]	5.81	6.76	0.08-25.6	3.91	2.57	0.08-7.83	4.49	9.65	0.13-21.75	0.09	0.11	0.02-0.25

Note. All 12 participants were asked to use the mindfulness content on the app, however, one did not register their use of the app, therefore N = 11 for total app usage data and mindfulness content used. As this was a single-group pre-post study with no comparison group, where total app use constituted the intervention, the number of intervention days is not applicable to represent the separate mindfulness content, sleep content, and kids content accessed. The specific variation of content used during the 30-day intervention is instead described here by the number of sessions of each kind of content completed, and the duration each was used for.

[a] Participants were asked to use 30 days' worth of content on the app.

[b] Duration of app use during the 30-day intervention period, in hours.

5.5.4 Preliminary effects on parent and target child outcomes

Parent Wellbeing. A large effect size was found for increases in parental mindfulness (*g* = .82, 95% CI .10, 1.51), reductions in parents general stress (*g* = -.72, 95% CI -1.40, -.03), anxiety (*g* = -.66, 95% CI -1.31, .02), and depression (*g* = -.61, 95% CI -1.25, .06), as well as increases in their use of cognitive reappraisal as an emotion regulation strategy (*g* = .63, 95% CI -.04, 1.28) after using *Headspace*. Inspection of the means also suggests reduced use of expressive suppression post intervention (M 9.20, SD 3.01) compared to pre-intervention (M 11.40, SD 3.43), and the corresponding effect size was moderate (*g* = -.51, 95% CI -1.14, .14).

Parenting. Improvements were also seen in mean scores for parenting stress from pre (M 42.40, SD 9.78) to post intervention (37.10, SD 4.89), with moderate effect sizes (*g* = -.50, 95% CI -1.12, .15). Similarly, mean daily hassles for parents reduced from pre (M 44.30, SD 14.08) to post intervention (39.10, SD 9.18), although this effect was small (*g* = -.29, 95% CI -.89, .33). Moderate effects with large confidence intervals were seen for closeness in the parent-child relationship (*g* = .44, 95% CI -.20, 1.06), although these changes were small (M 31, SD 3.02 pre-intervention compared to M 32.70, SD 2.45 post-intervention).

Children's Mental Health and Wellbeing. Although descriptively there was a slight reduction in children's externalising problems from pre (108.10, SD 21.26) to post (104.80, SD 12.34) intervention, the effect was negligible (*g* = -.11, 95% CI -.70, .49). This was also the case for children's prosocial behaviour (pre-intervention M 17.40, SD 2.91, compared to M 16.90, SD 3.14 post-intervention; *g* = -.15, 95% CI -.74, .45) and similarly for their emotion regulation (pre-intervention M 10.30, SD 2.26, compared to M 11.30, SD 2.54 post intervention; *g* = .26, 95% CI -.35, .86).

All the results described above are displayed in Table 5.4.

Table 5.4

Descriptive statistics (mean, standard deviation) and effect sizes (g) with corresponding 95% confidence intervals for parental and target child outcomes measured pre- and post- Headspace intervention (n = 10)

Outcome measure	*Pre- M (SD)*	*Post- M (SD)*	*M difference*	Hedge's *g*	*Lower 95% CI*	*Upper 95% CI*
FFMQ-15	3.05 (.38)	3.40 (.22)	-0.35	.82	.10	1.51
DASS-21 Stress	*19.80 (9.31)*	*10.90 (5.04)*	*8.90*	*-.72*	-1.40	-.03
DASS-21 Anxiety	*5.60 (4.78)*	*2.60 (2.12)*	*3.00*	*-.66*	-1.31	.02
DASS-21 Depression	10.60 (9.38)	4.60 (3.27)	6.00	-.61	-1.25	.06
PSS Total parenting stress	42.40 (9.78)	37.10 (4.89)	5.30	-.50	-1.12	.15
PDH Total intensity of hassles	44.30 (14.08)	39.10 (9.18)	5.20	-.29	-.89	.33
ERQ Cognitive reappraisal	23.30 (7.41)	28.30 (2.06)	-5.00	.63	-.04	1.28
ERQ Expressive suppression	11.40 (3.43)	9.20 (3.01)	2.20	-.51	-1.14	.14
CPRS Conflict	18.70 (4.92)	17.20 (4.00)	1.50	-.21	-.80	.40
CPRS Closeness	31.00 (3.02)	32.70 (2.45)	-1.70	.44	-.20	1.06
SCS Prosocial behaviour	17.40 (2.91)	16.90 (3.14)	.50	-.15	-.74	.45
SCS Emotion regulation	10.30 (2.26)	11.30 (2.54)	-1.00	.26	-.35	.86
ECBI (externalising issues)	108.10 (21.26)	104.80 (12.34)	3.30	-.11	-.70	.49

Note. ***indicates statistical significance p < .05***

Expressed Emotion. Tables 6.5 and 6.6 display the results of pre- and post- differences in expressed emotion, measured using the FMSS. There were large effects for reductions in the number of criticisms voiced about the target child in the speech samples (*g* = -.64, 95% CI -1.23, -.02) which reduced from an average of 1.00 (SD 1.21) at pre-intervention to an average of 0.17 (SD .39) at post-intervention, and conversely, the proportion of statements indicating a positive relationship increased from 33% pre-intervention to 67% post-intervention. Likewise, the proportion of participants rated as having low global EE ratings increased from 33% pre-intervention, to 75% post-intervention.

Table 5.5

Descriptive statistics (mean, standard deviation) and effect sizes (g) with corresponding 95% confidence intervals for expressed emotion about the target child, as measured by counts of criticisms and positive remarks in five-minute speech samples pre- and post- Headspace intervention (N = 12)

Expressed Emotion	*Pre- M (SD)*	*Post- M (SD)*	*M difference*	Hedge's *g*	*Lower 95% CI*	*Upper 95% CI*
Criticism	1.00 (1.21)	*.17 (.39)*	-.83	*-.64*	-.02	-1.23
Positive remarks	3.50 (2.61)	*3.75 (3.47)*	.25	.06	-.49	.61

*Note. *****indicates statistical significance p < .05*

Table 5.6

Proportion scores for positive initial statements, positive relationships, and low EE ratings as measured in five-minute speech samples pre- and post- Headspace intervention (N = 12)

Expressed Emotion	*Proportion pre- n (%)*	*Proportion post- n (%)*	*Z*	*p*	SE
EE Rating low	*4 (33%)*	9 (75%)	*2.24*	.013*	*.14*
Positive initial statements	*7 (58%)*	*5 (42%)*	*.82*	*.21*	*.20*
Positive relationship	4 (33%)	8 (67%)	2.00	.020*	.14

*Note. *****indicates statistical significance p < .05*

5.6 Discussion

Whilst previous research demonstrates that MBIs can be effective at reducing parental stress (Burgdorf et al., 2019), such interventions are usually delivered in-person, in group format, which can be expensive and inaccessible to non-clinical populations (Leijten et al., 2018). Furthermore, whilst the evidence base is growing for self-directed, app-based MBIs in general adult populations, there is a paucity of research involving parents specifically. The current study therefore sought to demonstrate the feasibility and acceptability of giving the *Headspace* app to parents of young children for 30 days, measuring their child's wellbeing, parental wellbeing, and the parent-child relationship. The results suggest that a mindfulness-based smartphone app (*Headspace*) is both feasible and acceptable for parents, and preliminary effects show promise for it as an intervention to reduce parental stress and potentially improve associated outcomes for young children. The study succeeded in recruiting 12 participants over 3 months, of whom 83% completed all outcome measures and adhered to daily app use for at least 10 days of the 30-day intervention. Qualitatively, as reported in Chapter 4, parents reported positive experiences of using the app, and quantitatively the pre-post outcome measures reported here were all in the direction of benefit.

5.6.1 Findings in context

During the period of data collection, parents who received access to *Headspace* for 30 days experienced reductions in stress, anxiety, depression, and improvements in dispositional mindfulness. Parents were also shown to use more cognitive reappraisal emotion regulation strategies after using the app than before. From the FMSS data, parents made fewer criticisms about their target child, and talked more positively about their relationships with them.

However, caution should be applied when interpreting these results due to the confounding effects of COVID-19 lockdowns easing when post-intervention data was collected (Burgess et al., 2022). The potential for confounding as a result of COVID-19 lockdowns easing is wide ranging (The British Academy, 2021), for example, the qualitative results described in Chapter 4 demonstrate that the effects seen here may be more reflective of parents having had greater access to extra-familiar childcare and the opening up of facilities at post-intervention (e.g., grandparent visits and nursery/play areas), than to the use of the app (Burgess et al., 2022). However, these preliminary results do seem to support the suggested mechanisms of action for mindfulness in parenting, i.e., that acceptance of the self and child, and presence in the current moment can help parents to reappraise stressful situations, interrupting negative cycles of interaction with their children (Dumas, 2005; Duncan et al., 2009; Young et al., 2018). Furthermore, these results are strengthened by the use of different, but complementary, types of outcome measures, i.e., both the FMSS and questionnaire data.

5.6.2 Research implications

In terms of the FMSS data, reductions in criticisms and increases in the proportions of relationship statements coded as positive, suggest improvements in parent-perception of the parent-child relationship. This was not captured substantively in the questionnaire data, but nonetheless indicates the potential for improvements in both parental experiences and future effects on children's outcomes. In particular, when using the EE coding system, higher criticism counts have been linked to poorer adjustment outcomes for children, being associated with increased externalising problems (Sher-Censor, 2015). Importantly, in demonstrating reductions in criticism counts, this study adds to that of previous literature

demonstrating parental criticism as measured by the FMSS may be susceptible to intervention and thus prevention (Gar & Hudson, 2009).

Having said this, some longitudinal data suggests that EE as measured by the FMSS is not predictive, and can only indicate a snapshot of parental experience given the specific environmental and developmental context the samples were recorded during (Richards et al., 2014). However, whether objective or subjective, parent-perception is arguably of greater significance than objective measures of children's attitudes and behaviours. Parent-perception is central to the definition of parental stress which has in turn been causally linked to children's adjustment outcomes (Deater-Deckard, 1998). Parent-perception has also been linked to satisfaction with the parent-child relationship (Miragoli et al., 2018), and is implicated in both emotion regulation (Hajal & Paley, 2020) and stress management (Cheung & Wang, 2022).

5.6.3 Clinical implications

Improvements were also found in parents' perceptions of parenting-specific stress and general stress from the questionnaire data. Perhaps more significantly for the suggested mechanisms of action of mindful parenting, however, is the increase in cognitive reappraisal as an emotion regulation strategy for parents in this study. Emotion regulation, and arguably the cognitive reappraisal aspect of it specifically, is thought to be what underpins the relationship between parental stress, parenting behaviours, and children's outcomes (Deater-Deckard, 1998). By improving parents' ability to reappraise a situation, it may be possible to interrupt the negative, ruminative feedback loop that is thought to impact on children's adjustment (Parent et al., 2016).

Promisingly, there was also an increase in dispositional mindfulness as measured using the FFMQ-15. However, it is important that these results be interpreted in light of the very small, non-controlled, homogenous sample, and furthermore, to highlight that the increase was marginal. It is perhaps also of note that when comparing the two participants who did not use the app to the ten who did, there was a relatively large difference in FFMQ-15 scores at baseline. Participants who did not use the app were less dispositionally mindful at baseline than those who engaged with the intervention.

Differences in baseline mindfulness between study completers and non-completers may be explained by motivation—those who started the study more interested in mindfulness, and more open to its potential benefits, may have been more likely to stick with the intervention. This is supported by a systematic review of parents' motivations to engage with psychological interventions, which found that whilst the literature largely focussed on parent perceptions of children's problems and of their own parenting, expectations about the proposed treatment and global motivation to engage with its content play an important role in parents' actual engagement with interventions (Pereira & Barros, 2019).

In this study, therefore, perhaps parents who started the study with lower expectations of mindfulness may have been less engaged with the intervention. A review investigating psychological therapy outcomes in adults demonstrated that patients who were more optimistic at baseline had more adaptive post-treatment outcomes (*d* = .24; Constantino et al., 2018). This suggests a perception management issue with mindfulness, which may be usefully targeted before giving such interventions to sceptical parents. However, the qualitative data reported in Chapter 4 suggests some parents who reported positive outcomes from using the app started the study as self-reported mindfulness 'sceptics'

(Burgess et al., 2022). An alternative explanation may therefore be that because the parents who did not use the app were more stressed and depressed at baseline, and were also struggling with a child who displayed more problematic externalising behaviours, they may have been less able to engage with the programme because it was not an explicitly parenting-focussed intervention.

Previous research by Dadds et al. (2019) which implemented an online behavioural parenting intervention found that parents of children with more adjustment problems were more likely to complete the intervention, suggesting that parents in greater need were more engaged with the study (Dadds et al., 2019). Therefore, it may be the case that parents of children with more problems in Dadds et al. (2019) sample were keen to engage with a parenting-specific intervention as they needed parenting-specific help. However, in this study, with *Headspace* being a broader intervention, with more delayed effects proposed for children's behaviour, the intervention offered may not have been sufficient reason for parents to continue engaging with it. I.e., parents' need for parenting-specific support went unmet by the *Headspace* app.

5.6.4 Strengths and limitations

Despite these issues, the parents in this sample used the app to a greater extent than in most other trials using *Headspace*. Adherence to app-based interventions is notoriously poor—on average, participants use less than half of the *Headspace* content they are asked to use (Liptáková et al., 2022). Here, participants completed the majority of the Basics sessions, and often completed more than was asked of them. In recruiting these participants, the primary researcher utilised personal and professional networks, which may explain the already-research-aware participants' readiness to engage with the study (Axford et al., 2012).

The included participants were also notably privileged (mostly White, educated, living in dual-income households), which may have influenced their attitudes towards health and wellbeing, as well as providing them with the resources to engage with a preventative intervention as part of a novel research study (Ross & Mirowsky, 2010). Going forwards, it may be prudent to test the effects of this app with a more heterogenous group of participants.

5.6.5 Conclusion and implications

In conclusion, the results of this study suggest that giving *Headspace* to parents of young children is both feasible and acceptable, and may help them to manage their stress and improve their perceptions of their children (as measured using the FMSS). However, as highlighted by the qualitative report in Chapter 4, the results presented here may not be attributable to the use of *Headspace*, but perhaps to the unique parenting context (i.e., COVID-19 lockdown) in which this research took place. These results may also be better explained by improvements in other aspects of parents' wellbeing not captured in the quantitative data (e.g., qualitatively reported improvements in sleep and changes in childcare). However, having established its feasibility and acceptability, the aim of Project 3 was to tease apart the effects of *Headspace* on a broader range of outcome measures from the contextual impacts in this study. This aim was operationalised by planning a more robust testing of the app using a controlled, randomised, three-armed internal pilot trial design.

CHAPTER 6

Headspace for parents – A pilot randomised controlled trial

This chapter presents data collected for Project 3 – originally planned to be an internal pilot for a definitive trial. However, issues with recruitment – at least in part a result of COVID-19 as described in the following section -- meant that this study became a pilot trial. However, in terms of reporting the study in this chapter, the hypotheses and analysis plans are reported with the original plans in mind, as pre-registered, but it is acknowledged where these plans changed, and changes are described in detail in the relevant sections of this chapter.

6.1 COVID-19 context

Whilst the data comprising Project 2 were collected during the initial phase of the COVID-19 response in the UK in 2020, and may therefore appear to be more overtly affected by the consequences of the pandemic, recruitment and retention for Project 3 (where data collection was conducted in two phases, from March-June 2021 and from November 2021-March 2022) was also affected. Furthermore, whilst the data collected for Project 3 may be seen to have an advantage to that collected in Project 2 as a result of the pandemic being a known entity when planning for it began, this may not necessarily be reflected in reality. This is because the effects of COVID-19, and the social restrictions put in place by the UK government were unpredictable and varied across the country throughout 2021, making the effects of it changing and difficult to anticipate in advance (Smith et al., 2022; Timmins, 2022). This section will contextualise the recruitment and retention issues for data collected for Project 3 and reported in this chapter.

6.1.1 Phase I data collection

Phase I data collection began in March 2021, and ended 3 months later in June 2021. The start of phase I data collection coincided with the third national lockdown ending when schools opened on 8th March (Institute for Government, 2022). This may have proved problematic for recruiting and retaining parents at this stage because, whilst parents may have experienced heightened stress during the final lockdown which may have increased interest in the study (which was specifically targeted at stressed parents), society opening up again may have increased the demands on their time, reducing the amount of time they perceived available to take part in the study.

There were also different levels of restrictions within the first phase of data collection, including the re-introduction of previous rules around the numbers of people allowed at gatherings (e.g., the Rule of 6), and changes to where these rules applied (Institute for Government, 2022; Smith et al., 2022). Applying the experiences of 2020 to 2021, as the pandemic progressed, there was a sense that it was something to be particularly feared during the winter, and that pressures on services may be eased during spring and summer periods (Del Rio et al., 2022). The effects of this on data collection might be that there were potentially different, seasonally-based, experiences of the pandemic between phase I data collection (spring/summer 2021) and phase II (autumn/winter 2021-2022)—with more outdoor activities and less extant fear of the virus in the spring-time potentially increasing other pressures on parents time during phase I.

By 2021, there was also a significantly increased mistrust in the UK government's decisions, and in the governing politician's ability to manage the crisis (Fancourt et al., 2022). This is a potentially significant factors for parents' experiences during phase I data collection

which followed on immediately from a full lockdown, because it has been demonstrated that less clear and direct messaging from politicians may increase perceptions of stress during pandemics (Lieneck et al., 2021; Xiong et al., 2020). Furthermore, although the intention of the different rules implemented by the government during phase I data collection was to avoid harsher restrictions being put in place, parents were undoubtedly still managing the effects of COVID-19 in their lives whilst trying to return to a sense of normality (Williams et al., 2022). This may not have been conducive for some parents to take part, and continue to stay in the study, given the relative intensity of daily practice, and the quantity and frequency of measures assessed.

6.1.2 Phase II data collection

Phase II data collection began in November of 2021, and ended 4 months later, in March 2022. This phase followed a period of significant freedom over the summer, with almost all government-imposed restrictions ending on 14th June 2021 (Institute for Government, 2022). However, only 1 month into data collection, the Omicron variant of COVID-19 became a serious concern in the UK and so-called "Plan B" measures were implemented (Del Rio et al., 2022; Institute for Government, 2022). Again, these measures were intended to avoid the need for more restrictive lockdowns, and they encompassed working from home wherever possible, mandatory face masks in public places, and mandatory NHS COVID Passes for some venues (Institute for Government, 2022). NHS COVID Passes were designed to allow entry to venues based on proof of either a negative laboratory test for COVID-19, or a full vaccination history (at the time, 3 doses for members of the public, or 4 for healthcare workers; UKHSA, 2021). Concerns were high about the Omicron variant causing another winter lockdown which would "cancel" Christmas (Iacobucci, 2021). However, in the event, the holiday period of 2021

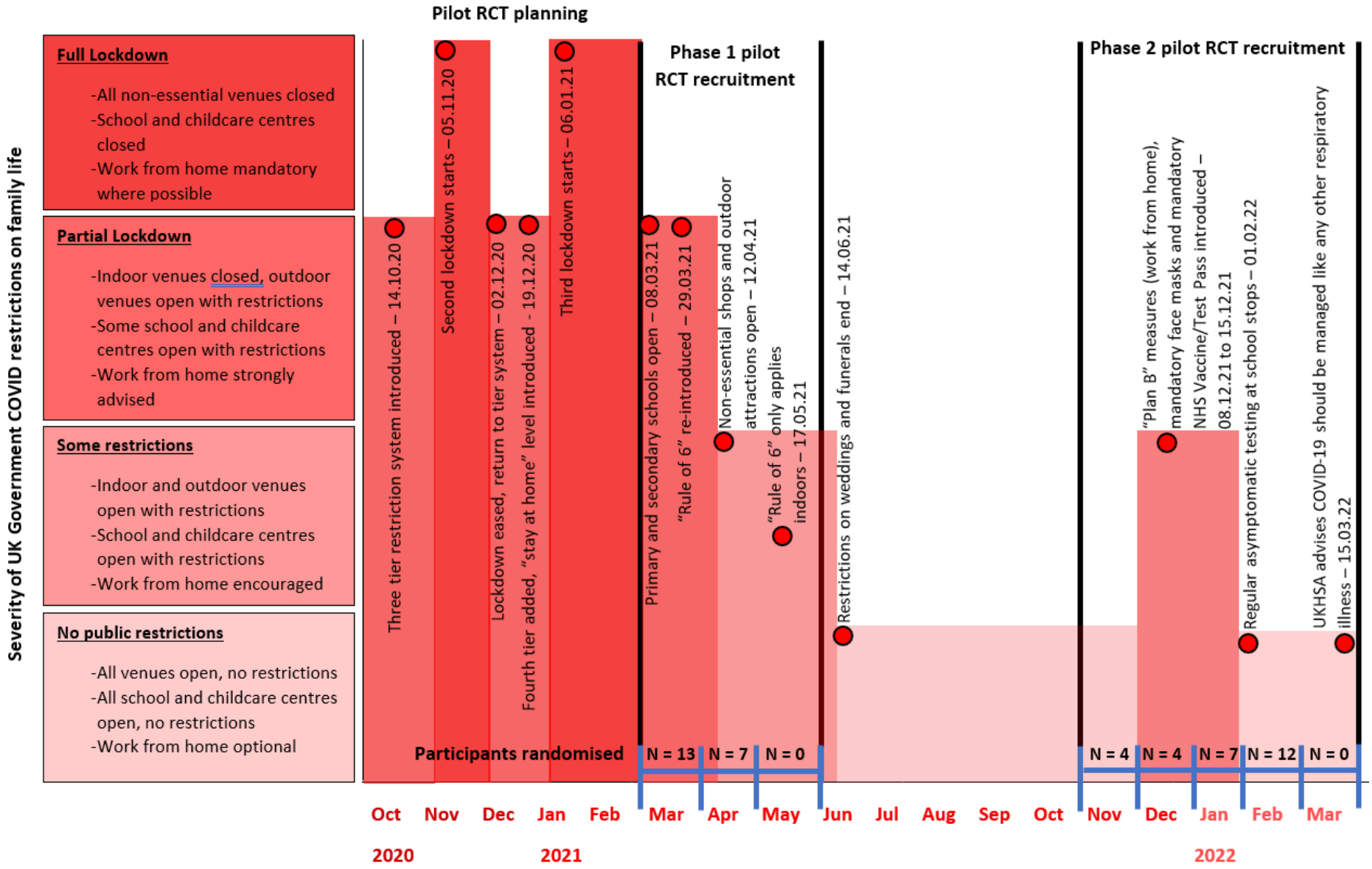
to 2022 was the first time many families were able to celebrate together in almost two years, with 63% of people in the UK intending to visit family or friends in 2021 as compared to 24% in 2020 (ONS, 2022c).

Christmas, however, is known to be a particularly potent stressor for many families despite its positive connotations (Mutz, 2016), and therefore it may be expected that the Christmas which was encompassed by phase II of data collection may have been especially stressful for parents who were interested or taking part in this study. To add to the uncertainty, despite preventative ventilation measures not being consistently rolled out in schools around the country, regular asymptomatic testing in schools was stopped on 1st February 2022 (DfE, 2022; Timmins, 2022). This quickly followed with official guidance from the UK Health and Security Agency that COVID-19 should be treated as any other respiratory illnesses are treated in March 2022 (UKHSA, 2022). In reality, from February onwards there was little to no official social restrictions in place to manage the spread of COVID-19 and it was generally accepted that life in the UK had returned to "normal". By this stage in data collection, it became apparent that it was not feasible to recruit and retain parents to the study with the protocols it started with. Although restrictions were all but over towards the latter half of phase II data collection, as previously stated, this may only have served to increase the demands on parents' time. Having been variously in and out of "normal" functioning for the previous two years, it is perhaps not beyond speculation to suggest that this period provided heightened stress to parents engaging with a range of activities that they may have not consistently had to manage since the early part of 2020—prior to the first lockdown (Williams et al., 2022).

As a result of all the uncertainty and the speculated impacts on parent experience described above, it is proposed that despite restrictions ostensibly easing, COVID-19 did continue to impact parents, and negatively impacted the recruitment and retention of participants in Project 3. The restrictions described here are mapped along with the two phases of recruitment in Figure 6.1.

Figure 6.1

Impact of COVID-19 restrictions in the UK on planning and recruitment for Project 3



6.2 Abstract

Parental stress has been implicated in family dysfunction, in particular driving children's adjustment problems. Mindfulness has been demonstrated to reduce stress, and may improve sleep quality, which in turn may further reduce stress. Here, it is theorised that parental use of a mindfulness-based, commercially available app (*Headspace*) may improve children's adjustment by increasing parental mindfulness and/or sleep quality, thereby improving parents' stress and emotion regulation capacity. As part of an internal pilot randomised controlled trial (RCT), UK parents of 2–5-year-olds were randomly allocated to either a waitlist control group, or an intervention group, where they were asked to use 30 days of *Headspace* content. Of the 236 interested and eligible participants, only 64 (27%) started study procedures. Of whom, 57 consented to baseline measures but only 29 (51%) completed post-intervention measures and were included in the analysis (intervention n = 14, waitlist n = 15). Adherence among study completers was good—the average number of *Headspace* sessions completed was 17.86 (SD 17.55), used over an average of 14 (SD 12) days. However, difficulties with recruitment and retention demonstrated a definitive trial using the same protocol, with the resources available to both parents post-COVID-19 and the researcher, was not feasible. Preliminary effect sizes were calculated for all primary and secondary outcomes, but large effects were found only for reductions in parental sleep disturbance (g = -1.53), and reductions in parent-reported children's sleep problems (g = -*1.05)).* With small sample sizes and large confidence intervals, caution is warranted interpreting these results. However, as qualitative work with parents using *Headspace* also highlighted its utility for improving parental sleep quality, future research may benefit from investigating this more robustly.

6.3 Introduction

Mindfulness is described as the practise of giving non-judgmental attention to experiences in the present moment (Kabat-Zinn, 2003), and can be thought of as a teachable cognitive skill to help improve distress tolerance and emotion regulation (Crane et al., 2017). Mindfulness-based programmes are increasingly used as the next generation of cognitive-behavioural treatments for a variety of mental health problems (Davis & Hayes, 2011). Mindfulness has also been applied as part of parent training programmes, to improve children's adjustment and family functioning (Parent et al., 2016). Some of the more common children's adjustment problems, such as conduct disorders, are thought to be in part driven by harsh and coercive, parent-focused parenting (Patterson, 1982), which in turn is understood to be driven by stress (Lunkenheimer et al., 2017). It is proposed that in such circumstances, the parent and child 'train' each other to behave in a negative, reinforcing pattern (Granic & Patterson, 2006; Patterson et al., 1989). Mindfulness has been theorised to interrupt this kind of automatic cognitive loop (Dumas, 2005). Therefore, it is proposed that mindfulness may reduce parenting stress and improve emotion regulation, which in turn may improve the parent-child relationship and reduce reliance on automatic, negative, parenting practises, resulting in improvements in children's adjustment (Duncan et al., 2009; Parent et al., 2016).

6.3.1 Mindfulness-Based interventions (MBIs)

Traditional mindfulness interventions are delivered in-person, which is both costly and inaccessible to many families, especially with reduced capacity of healthcare services following the COVID-19 pandemic (Reed et al., 2022). Self-directed mindfulness using *Headspace* has been effective in a range of different settings, including with office workers,

university students, and healthcare workers (Economides et al., 2018; Howells et al., 2016; Lim et al., 2015; Taylor et al., 2022b; Wylde et al., 2017). Indeed, a recent systematic review of digital mindfulness-based interventions found that self-help MBIs have comparable effects on stress to interventions delivered in-person (Taylor et al., 2021). However, there is minimal evidence for the effectiveness of digital MBIs with parents specifically, as demonstrated in Chapters 3 and 5. Parents may have additional barriers to practising mindfulness daily, as well as additional parenting specific and general stress, such that it is important to test the feasibility, acceptability, and initial effects of self-directed mindfulness interventions with this population specifically (Dimidjian & Segal, 2015; Parent et al., 2016).

6.3.2 Headspace for parents

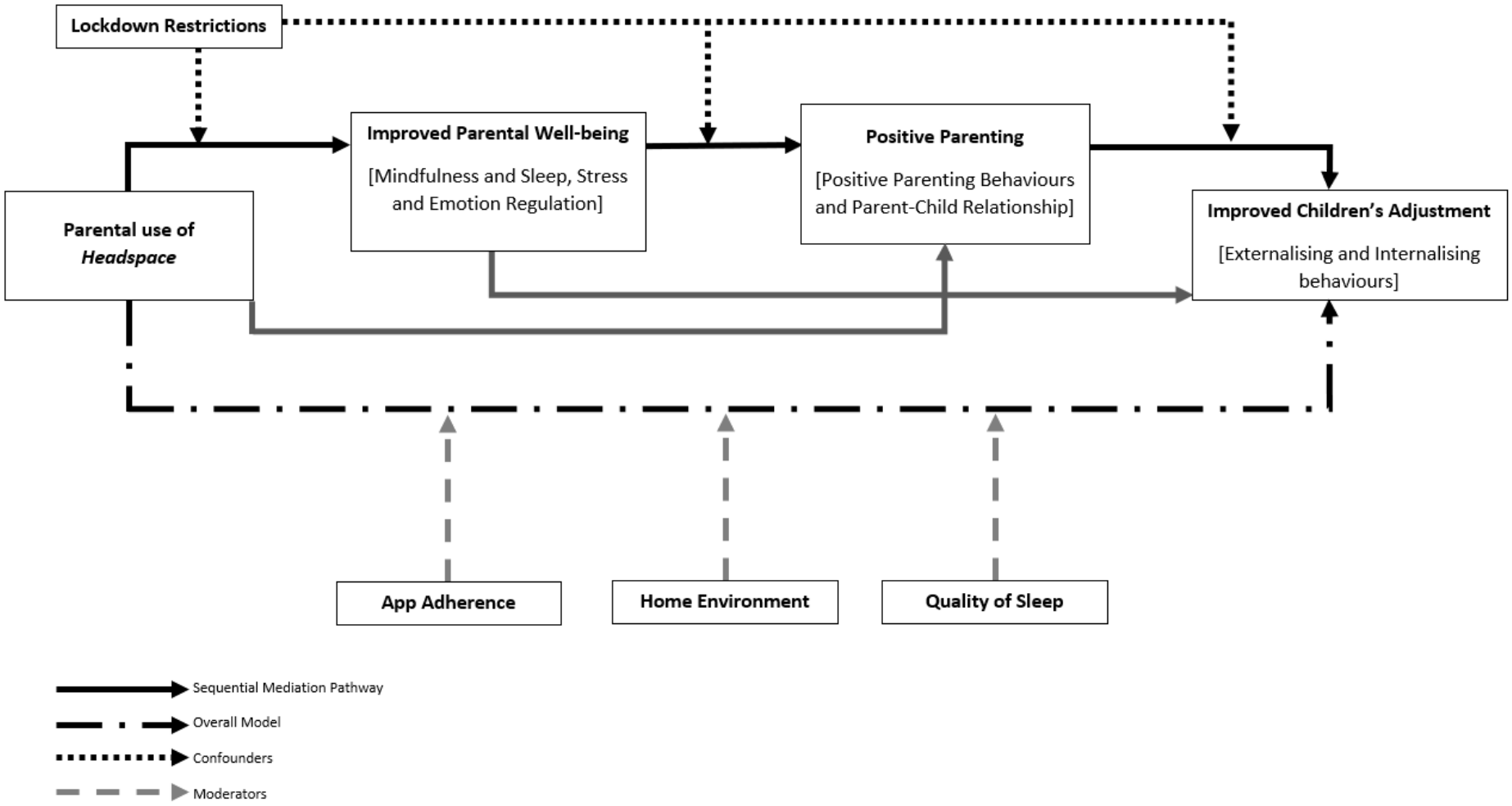
This study builds on the previous pilot study, where access to the *Headspace* app was provided to a small group of 12 self-selecting parents of children aged 2-5 years old, collecting mixed methods data to investigate the initial feasibility and acceptability of the app for this population (Burgess et al., 2022). Qualitatively, parents reported that using *Headspace* was both feasible and acceptable, although some barriers to daily practice (e.g., it being easier to schedule in at night) were noted. Parents also qualitatively expressed some improvements in their ability to manage stress as well as their relationships with their children, and, although confounded by lockdown interference, these reports were echoed in the quantitative data. The quantitative data also promisingly suggested that study procedures, as well as recruitment and retention to the study and intervention, were similarly feasible for this population.

However, whilst promising, it is important to note that this previous mixed methods study was uncontrolled and investigated a small, homogenous sample of mostly very well

educated, White/White British mothers (n = 11, 92%). And furthermore, that other research investigating parents attempting to use self-directed MBIs like *Headspace* in an RCT design, have reported extensive difficulties with recruitment and retention (Hartley et al., 2022; Militello et al., 2022). As such, in order to determine the feasibility of a definitive trial using *Headspace* with parents, an internal pilot trial was planned. This trial aimed to explore the mechanisms underlying the potential utility of the app for parents, and to build on the previous study's findings with a more robust, controlled design if the protocol proved feasible. The proposed underlying mechanisms of mindfulness are presented in the model of mindful parenting described in Chapter 1, and available here in Figure 6.2. In the event, due to recruitment issues, this study became a pilot trial.

Figure 6.2

Headspace for parents' theoretical model and links



6.3.3 The current study

As visualised in Figure 6.2, this pilot RCT aimed to investigate the effects of giving parents access to the *Headspace* app on children's externalising problems, via improvements in parental wellbeing (including stress, sleep, mindfulness, and emotion regulation) and subsequent improvements their parenting practices. These aims resulted from an attempt to address the gaps in the literature identified in Chapter 3, i.e., the lack of evidence for digital MBIs (like *Headspace*) delivered to parents of typically developing children. Further to this, previous research investigating MBIs for parents has proliferated at stage I of the NIH stage model for behavioural interventions (NIH, 2023)—small, uncontrolled, single-group trials for intervention generation/refinement—whereas this study intended to provide evidence for *Headspace* at stage II of the model (research-led efficacy). Following learning from the mixed methods study in Project 2, which identified sleep as an important element of parental use of the app, a three-armed internal pilot RCT was planned to incorporate two intervention groups and one waitlist control group. One intervention group was instructed to only use the introduction to mindfulness content on the app and the other was instructed to only use the sleep content on the app.

The mindfulness-only group was included as the literature suggests there will be beneficial effects of the mindfulness elements of the *Headspace* app on parents' general and parenting stress, which may lead to improvements in children's adjustment outcomes (Parent et al., 2016). The sleep-content only group was included as a result of learning from the qualitative work reported in Chapter 4 which identified sleep as a potential mechanism by which the app may reduce parents' stress and improve their children's outcomes (Burgess et al., 2022). Specifically, parents reported that using the app helped them to get to sleep

quicker which they suggested led them to be more tolerant of their child's behaviour the following day (Burgess et al., 2022). These parent reports support research by McQuillan et al. (2019) which found that not only was a lower quality of parental sleep associated with higher levels of stress, but also with less observed positive parenting. It was therefore theorised that improvements in parents' sleep as a result of using *Headspace* may improve child adjustment outcomes by reducing parental stress.

6.3.3.1 Hypotheses

In order to test the model of mindful parenting presented in Figure 6.2, a series of hypotheses were made regarding the projected effects of the intervention on a range of parent and child outcomes. The original intention with this study was to test these hypotheses, however due to recruitment issues (described in full in sections 6.6.1 and 6.5.2), in the event, it was not possible to test them. The original hypotheses relating to the main pathway in Figure 6.2, i.e., children's externalising and internalising problems, parental wellbeing including mindfulness, sleep, stress and emotion regulation, and parenting including positive practices and parent-child relationships, are presented here in Table 6.1 for context.

Table 6.1

Internal pilot RCT hypotheses

Outcomes	Variable	Measure	Hypotheses
Primary	Child Adjustment - Externalising behaviours	Eyberg Child Behaviour Inventory (ECBI; Eyberg & Pincus, 1999)	1. (a.) There will be a reduction in parent-reported children's problem behaviours for parents who engage with a programme of daily self-directed *Headspace*-app content for 1 month, in comparison to those who do not use the app from T1 to T2. (b) There will be a greater reduction in parent-reported children's problem behaviours for parents in the mindfulness only in comparison to the sleep group from T1 to T2.
Secondary	Child Adjustment - Emotion Regulation	Social Competence Scale (SCS; Corrigan, 2002)	2. (a) There will be an increase in parent-reported children's social competence for parents who engage with a programme of daily self-directed *Headspace*-app content for 1 month in comparison to those who do not use the app from T1 to T2. (b) There will be a greater increase in parent-reported children's social competence for parents in the mindfulness only group in comparison to the sleep group from T1 to T2.
	Parent Dispositional Mindfulness	Short-form Five Facet Mindfulness Questionnaire (FFMQ-15; Baer et al., 2008)	3. (a) There will be an increase in dispositional mindfulness for parents who engage with a programme of daily self-directed *Headspace*-app content for 1 month in comparison to those who do not use the app from T1 to T2. (b) There will be greater increases in dispositional mindfulness for parents in the mindfulness only groups in comparison to those in the sleep and waitlist control groups from T1 to T2.

	Parent Quality of Sleep	Pittsburgh Sleep Quality Index (PSQI-9; Buysse et al., 1989)	4. (a) Quality of sleep will improve more for parents in the mindfulness only and sleep groups in comparison to the waitlist group from T1 to T2. (b) There will be a greater improvement in quality of sleep for parents in the sleep group in comparison to the mindfulness only group from T1 to T2.
	Child Quality of Sleep	Short-form Children's Sleep Habits Questionnaire (SF-CSHQ; Bonuck et al., 2017)	5. There will be a greater improvement in parent reported perceptions of children's sleep quality for the parents in the mindfulness only and sleep groups in comparison to the waitlist group from T1 to T2.
	Parental Wellbeing	Short-form Depression, Anxiety, and Stress Scale (DASS-21; Lovibond & Lovibond, 1995); Parenting Stress Scale (PSS; Berry & Jones, 1995);	6. (a) There will be a decrease in general stress scores for parents who engage with a programme of daily self-directed *Headspace*-app content for 1 month in comparison to those who do not use the app from T1 to T2. (b) There will be no difference in reduction of general stress scores for parents in the mindfulness only group, compared to parents in the sleep group from T1 to T2. (c) There will be a decrease in parenting-specific stress scores for parents who engage with a programme of daily self-directed *Headspace*-app content for 1 month, in comparison to those who do not use the app from T1 to T2. (d) There will be no difference in reduction of parenting-specific stress scores for parents in the mindfulness only group, compared to parents in the sleep group from T1 to T2.

	Emotion Regulation Questionnaire (ERQ; Gross & John, 2003)		(e) There will be an increase in parental emotion regulation for parents who engage with a programme of daily self-directed *Headspace* content for 1 month, using the *Headspace* app, in comparison to those who do not use the app from T1 to T2. (f) There will be no difference in increases of parental emotion regulation for parents in the mindfulness only group, compared to parents in the sleep group from T1 to T2
Parenting	Alabama Parenting Questionnaire for Pre-schoolers (APQ-PR; Clerkin et al., 2007); Short-form Child Parent Relationship Scale (CPRS; Pianta, 1992)	7.	(a) There will be an increase in positive parenting practices for parents who engage with a programme of daily self-directed *Headspace*-app content for 1 month in comparison to those who do not use the app from T1 to T2. (b) There will be a greater increase in positive parenting practices for parents in the mindfulness only group in comparison to parents in the sleep group from T1 to T2. (c) There will be an increase in parent-reported closeness and a decrease in parent-reported conflict in the parent child relationship for parents who engage with a programme of daily self-directed *Headspace* content for 1 month, using the *Headspace* app, in comparison to those who do not use the app from T1 to T2. (d) There will be a greater increase in closeness in parent-reports of the parent-child relationship for parents in the mindfulness only group, compared to parents in the sleep group from T1 to T2. (e) There will be no difference in decreases in conflict in parent reports of the parent-child relationship for parents in the mindfulness only group, compared to parents in the sleep group from T1 to T2.

The primary outcome was identified as children's externalising behaviours because this is the outcome that best represents the overarching purpose of this thesis—to improve children's wellbeing in the long term by improving parents' wellbeing via increased parental mindfulness and reduced parental stress. It was hypothesised that there would be a reduction in children's externalising behaviours (the most apparent of child adjustment problems for parents; Tandon et al., 2009) following the 30-day intervention, with reductions being more apparent in the mindfulness group than the sleep group. The secondary outcome pertaining to children's adjustment encompassed internalising problems, although these are often less apparent to parents (Tandon et al., 2009), and therefore potentially under-reported by them and thus more difficult to intervene with (Costello, 2016; Pedersen et al., 2022). An additional secondary children's outcome was included in the form of parent-reported children's sleep quality, in order to better understand the potential effects of *Headspace* on sleep found in Project 2. Secondary outcomes encompassing parental wellbeing included hypothesised improvements in parental mindfulness, improvements in quality of sleep, improvements in general stress, parenting stress, and emotion regulation. Secondary outcomes regarding the parenting dimension of the model, included hypothesised improvements in positive parenting practices, improved parent-child relationships, and improved co-parenting relationships where applicable.

Although improvements in children's outcomes were hypothesised to be of primary concern, this was considered in light of the previous evidence (Burgdorf et al., 2019) where small effects have been found, such that large effect sizes were not anticipated to be apparent in either group. This may be because there is likely to be a delayed improvement if mindfulness does indeed improve family functioning via the mechanism of reductions in parental stress

and improvements in positive parenting practices (Duncan et al., 2009). In terms of parenting outcomes, perhaps the most salient element of wellbeing for the proposed model is parental stress. It was hypothesised that parents' reports of stress would reduce significantly from pre- to post- intervention in both intervention groups in comparison to the waitlist control group.

Of interest from the previous qualitative work were parent and child sleep outcomes. It was hypothesised that parents self-reported sleep quality in both intervention groups would improve compared to the waitlist group, but that those accessing only the sleep content would improve more than those in the mindfulness group because of the intentional sleep-orientated sessions. There is, however, evidence to suggest that mindfulness practice more broadly may be associated with improved sleep due to decreases in sleep-interfering cognitive process such as rumination (Shallcross et al., 2019; Winbush et al., 2007), but the literature is heterogenous and has been conducted in general population samples, which are not necessarily applicable to parents (Economides et al., 2023).

6.3.3.2 Study aims

In summary, this pilot RCT aimed to understand the feasibility and acceptability of testing *Headspace* with parents in an RCT design, as well as the preliminary effects of different content on the *Headspace* app on children's adjustment outcomes, as a result of improvements in parental mindfulness, reductions in parental stress, improvements in sleep, emotion regulation, positive parenting practices, and relationships between parent and child and between co-parents. As a result of previous qualitative work, whereby parent perceptions of the utility of *Headspace* highlighted improvements in sleep as being more beneficial to their experiences than the mindfulness skills they learnt during the intervention, and the lack of

evidence regarding the exact mechanism of action by which mindfulness is understood to improve parent and child outcomes, if feasible as a definitive trial, this study also aimed to explore which components of the model in Figure 6.2 may or may not be driving effects. It was anticipated that there would be differences in outcomes depending on which content was accessed—the sleep only content or the mindfulness only content, and that these differences would illuminate more precisely how mindfulness may help parents. Given the feasibility and acceptability issues to be tested in a more rigorous design, and the theoretical model of mindful parenting represented in Figure 6.2, along with the corresponding hypotheses in Table 6.1, the research questions this study aimed to answer can be summarised as:

1. Is a three-armed RCT with parents of children aged 2-5 years old, testing the effects of using the *Headspace* app for 30 days feasible?
2. Does parental engagement in a programme of self-directed meditation using the *Headspace* app improve children's adjustment outcomes (specifically externalising behaviours)?
3. Does engaging with a programme of self-directed meditation using the *Headspace* app improve parental mindfulness, reduce parental stress and general stress, anxiety and depression, improve parent self-report and parent-report of child sleep quality, improve parental emotion regulation, parent-child relationships, co-parenting relationships and increase positive parenting practices in parents with children aged 2-5 years old?
4. Are there differential effects on parent and child outcomes associated with use of either mindfulness specific content or sleep related content on the *Headspace* app?

6.4 Methods

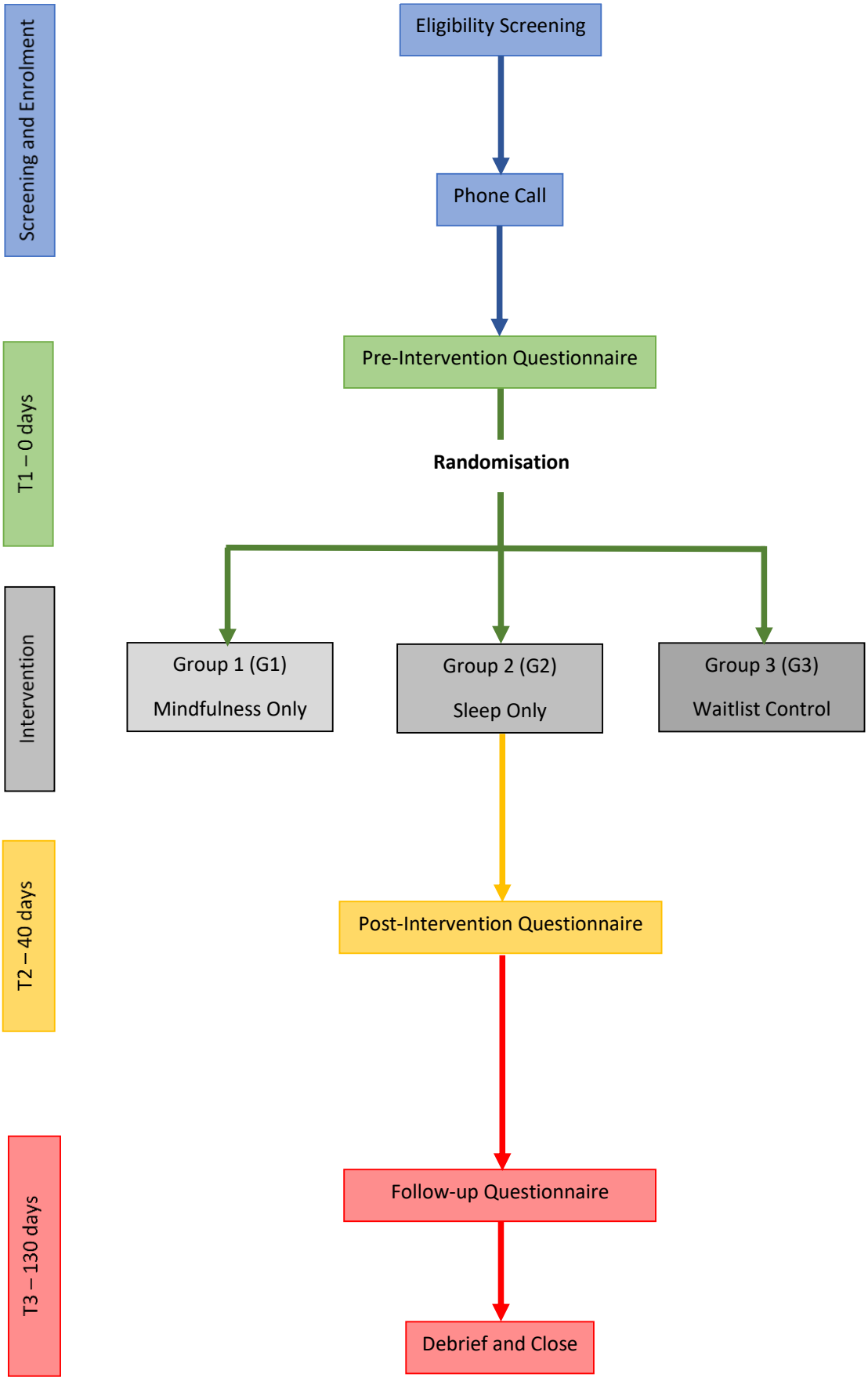
6.4.1 Design and ethics

This pilot RCT was pre-registered on the Open Science Framework (Burgess et al., 2021; available at: osf.io/y3p7d). As this is a novel field, this study intended to determine recruitment feasibility and adherence to both study procedures and the *Headspace* intervention before taking the decision to proceed to a full trial (Avery et al., 2017). Ethical approval was granted by the Institute of Education at UCL (Data Protection Registration Number: Z6364106/2020/11/91). Written, informed consent was obtained from all participants.

Figure 6.3 represents participants' journey through the study. Parents completed baseline measures (T1) before being randomly allocated to one of three groups—two active intervention groups and a wait list control group. Post-intervention measures (T2) were sent to participants 40 days after T1. Follow up measures (T3) were sent out 3 months after T2, during which time all participants were asked not to engage in using the app, mindfulness, or other meditative practices.

Figure 6.3

Participant journey through the internal pilot RCT (Project 3)



6.4.2 Intervention

Headspace provides a variety of mindfulness-based content aimed at improving wellbeing. In this study, participants were asked to either use only mindfulness-specific content, or only sleep-specific content for 30 days. For those allocated to the waitlist, participants were made aware that they will be given access to the app after they completed the follow-up questionnaire (four months after starting the study). Participants in the intervention groups were sent detailed instructions for how to use the app, as well as "App Maps" (see Appendices K, L and M) which pictorially demonstrated their path through the study. Participants on the waitlist were also provided with "instructions" and a map detailing the significant time points in the study to ensure consistency across the groups. As a means of engaging participants with the intervention and improving adherence, emails were scheduled to send participants short video clips at the 10-day, 20-day, 30-day and 40-day time points after starting the study (see Appendix H). These videos contained information and reminders pertinent to the group they were allocated to, and were included because some parents in Project 2 reported appreciating speaking with and getting to the know the researcher during the study, and so these videos were intended replicate the researcher's involvement without the qualitative measures being present.

6.4.3 Randomisation method

Participants were randomised to one of three arms using permuted-block randomisation, to which the primary researcher collecting the data was blinded. A randomisation scheme was generated by an independent researcher at King's College London, using the Robust Randomisation App (RRApp; Tu & Benn, 2017), and then inputted into the Research Electronic Data Capture (REDCap) System hosted at UCL, which was used

to collect and store all participant-reported data for the duration of the study (Harris et al., 2009, 2019). Participants were electronically randomised on REDCap to each group by the primary researcher collecting the data. As it was not possible to blind the intervention, randomly varied block sizes were used as a method of allocation concealment (Broglio, 2018).

6.4.4 Participants

6.4.4.1 Recruitment

Opportunistic, snowball sampling methods were utilised. Recruitment was conducted remotely, via social media networks including Twitter and Facebook, as well as by advertisements for the study distributed to nurseries and schools, and in other local community venues (e.g., community centres, supermarket notice boards) with some assistance from MSc and placement students at both UCL and the University of Sussex.

To mitigate the risk of bots and other fraudulent online participation (Pozzar et al., 2020), known community networks (both online and in-person) were utilised where possible, and a video/telephone call (hereon; call) was organised with the primary researcher collecting the data to introduce the study to interested and eligible participants. The online questionnaires, and later *Headspace* access information, were delivered via email after the call confirmed non-fraudulent participation and parent understanding of the trial.

6.4.4.2 Inclusion criteria

One parent per family (>18 years of age) of children aged 2-5 years old were invited to take part in this study. Parents were eligible if they were fluent in English, resident in the UK for the duration of the study (to limit the effects of different COVID-19 restrictions across country borders), and who were cohabitating (for at least 4 days a week in the case of shared

custody arrangements) with their child/ren. No restrictions were placed on gender, age, marital status, ethnicity, or employment status, however, parents who had used the *Headspace* app (or practised any other form of meditation) regularly in the last 6 months were excluded. Parents of twins, and parents and/or children who had a neurodevelopmental disorder, and/or who had received any form of psychiatric/psychological treatment in the last 6 months, were excluded due to confounding effects on outcome measures of parental wellbeing (e.g., the Depression, Anxiety, and Stress Scale [DASS-21]; Lovibond & Lovibond, 1995).

6.4.4.3 Retention

Participants who did not complete T1 measures within 3 weeks of receiving them, after two email reminders, were considered to have withdrawn from the study, unless they communicated otherwise by completing the questionnaire. Participants who did not complete T2 and T3 measures were considered to have been lost to follow up, unless they communicated their wish to withdraw. Participants were sent up to two reminder emails to complete T2, and up to a further two emails to complete T3 questionnaires. Participants who withdrew at any point in the study were removed from the sample. Participants who did not explicitly request to withdraw from the study, but who did not complete T2 and/or T3 measures, were made aware that if they did not request to withdraw their data before it was anonymised, the data would not be removed from the study as it would not be possible to identify them. All data were anonymised as soon as possible after phase II data collection was complete in line with the study's data management plan, and participant information sheet (see Appendices I and J). Figure 6.4 depicts a CONSORT Flow Diagram (Schulz et al., 2010)

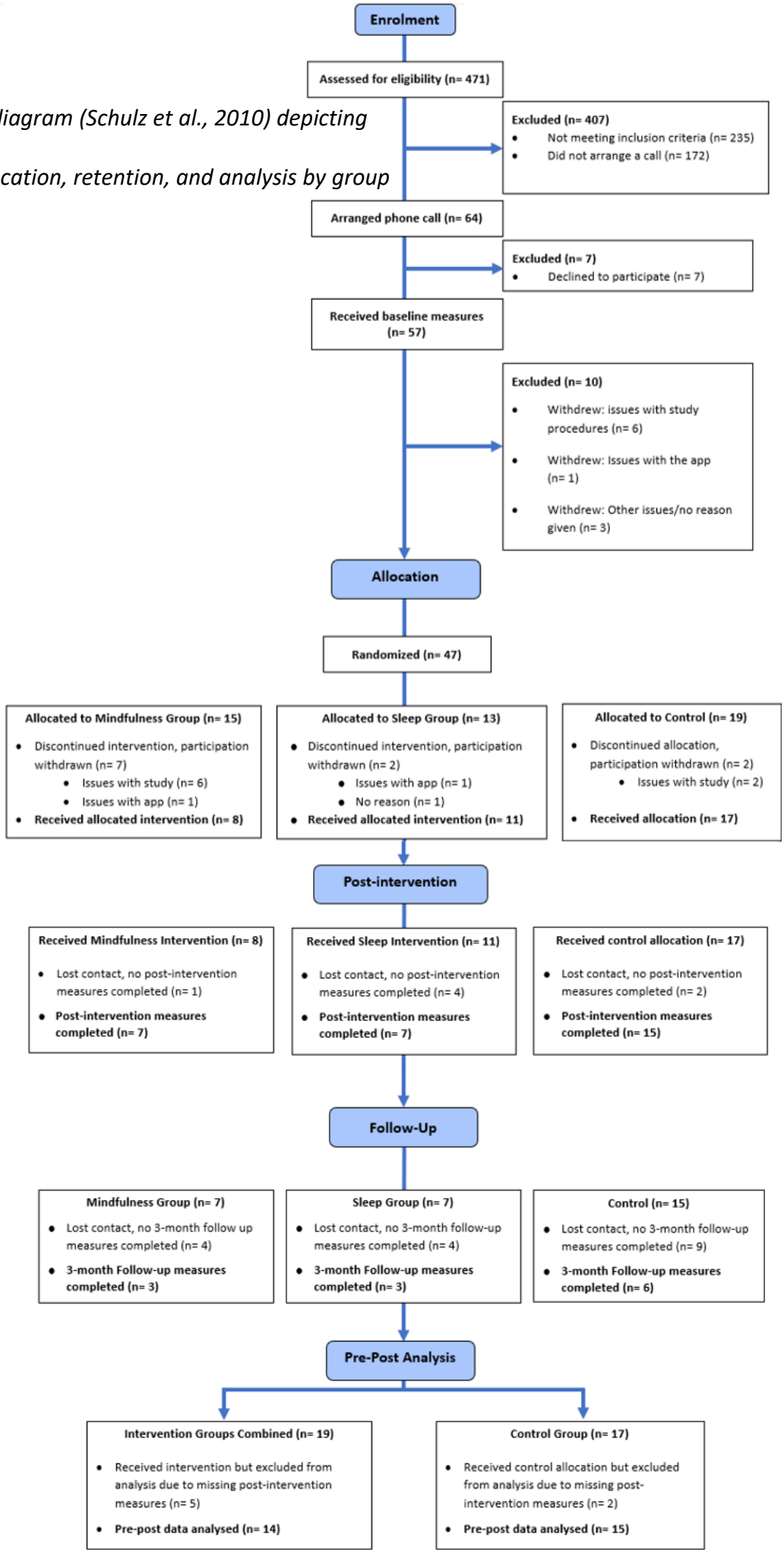
indicating participant retention at each stage of recruitment, including reasons for withdrawal where given.

6.4.4.4 Adherence

It was pre-registered that participants would be considered to have adhered to the protocol if they completed at least 50% of the sessions they were invited to use (i.e., used the app for 15 days). It was arranged with *Headspace* that usage data would be gathered every 3 months to monitor adherence to the intervention, however, in the event, recruitment was split into two phases—neither of which exceeded 3 months individually. Furthermore, difficulties with recruitment demonstrated that a definitive trial would not be feasible with the current study procedures, and therefore, using adherence to inform the planned analyses (i.e., per protocol and intention to treat) at the definitive stage was not applicable. Because of this, usage data was requested from *Headspace* at the end of phase II data collection, not during the data collection.

Figure 6.4

CONSORT Flow diagram (Schulz et al., 2010) depicting recruitment, allocation, retention, and analysis by group



6.4.5 Measures

Demographic details were collected at baseline, including parent and child age, ethnicity, and gender, as well as parental marital and employment status, and childcare arrangements.

The varying impacts of COVID-19 on families were measured using a modified form of the COVID-19 Exposure and Family Impact Survey (CEFIS; Kazak et al., 2021). Two subscales measuring Exposure to COVID-19 and Impact of COVID-19 (31-items) were used. The Impact subscale includes statements like "How family members get along with each other" that participants rated on a 4-point Likert scale (Made it a lot better to Made it a lot worse), whereby higher scores indicate more negative impact (or greater distress resulting from COVID-19). The Exposure subscale was measured using a "yes" count whereby higher scores indicate more family exposure to COVID-19, including statements like "We have self-isolated due to travel or possible exposure". When validating it, the measure's authors found a Cronbach's alpha of .80 for the Exposure scale, and .92 for the Impact scale. Here, a Cronbach's alpha of .78 was found for the Exposure scale, and .69 for the Impact scale.

Objective app usage data was collected via participant codes, facilitated by *Headspace.* This included the type and duration of content accessed, as well as the date and time of access, measured for the duration of the 40 days given to complete the 30-day intervention, starting when participants registered the app with their code.

6.4.5.1 Primary Outcome

Child externalising problems. Parent-reported child externalising problems were measured using the Eyberg Child Behaviour Inventory (ECBI; Eyberg & Pincus, 1999); a 36-

item scale with two subscales. The Intensity subscale was used which uses a 7-point Likert scale (1 = Never, 7 = Always) to rate statements which might describe a child, like “Dawdles in getting dressed”, whereby a higher score indicates more problem behaviours. High internal consistency has been reported in previous research, with a Cronbach’s alpha of 0.91 for the intensity scale (Morawska & Sanders, 2006). In this study, a Cronbach’s alpha of 0.93 was found.

6.4.5.2 Secondary Outcomes

Child internalising problems. Parent-reported child internalising problems were measured using the Social Competence Scale (SCS; Corrigan, 2002). This is a 12-item scale comprised of two sub-scales measuring Prosocial Behaviours/Communication Skills and Emotion Regulation Skills, measured by how well each statement, for example “Your child copes well with failure”, describes a child on a 5-point Likert scale (1 = Not at all, 5 = Very well). Higher scores indicate more competence in the respective social domains. High internal consistency was found in a community sample with an alpha of .92 for the total scale (Gouley et al., 2008). In this sample, a Cronbach’s alpha of .85 was found.

Parental dispositional mindfulness. Self-reported dispositional mindfulness was measured using the 15-item version of the Five Facet Mindfulness Questionnaire (FFMQ-15; Baer et al., 2008). This scale comprises of 5 subscales (Observing, e.g., “When I take a shower or a bath, I stay alert to the sensations of water on my body”, Describing, e.g., “I'm good at finding words to describe my feelings”, Acting with Awareness, e.g., “I do jobs or tasks automatically without being aware of what I'm doing”, Non-Judging of Inner Experience, e.g., “I think some of my emotions are bad or inappropriate and I shouldn't feel them”, and Non-Reactivity to Inner Experience, e.g., “When I have distressing thoughts or images, I just notice

them and let them go"). It is measured using a 5-piont Likert scale (1 = Never, 5 = Very Often), where higher scores indicate more mindfulness. Prior research found a four-factor structure which excludes the Observing subscale is more appropriate, finding alpha's ranging from .91 to .77 for the remaining subscales (Gu et al., 2016). In this sample, Cronbach's alphas ranged from .90 to .72 for the subscales excluding Observing, and an alpha of .82 was found for the total scale.

Parental Sleep quality. Parents' self-reported quality of sleep was measured using the 9-component Pittsburgh Sleep Quality Index (PSQI-9; Buysse et al., 1989). This study's focus on subjective experience and functioning, as well as the confounding of some non-sleep items with the DASS-21 (e.g., question 8 of the PSQI-9 is "During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?") resulted in only one subscale being utilised, sleep disturbance (e.g., "Cannot get to sleep within 30 minutes") and a single subjective sleep quality item. The subscale was measured using a 4-point Likert scale (1 = not during the past month/Not a problem at all, 4 = three or more times a week/a very big problem). The subjective sleep quality question asked respondents to rate their sleep from 1 (very good) to 4 (very bad). Higher scores on the sleep disturbance subscale indicates fewer disturbances, but higher scores on the single subjective sleep quality item indicates poorer perceptions of sleep quality. Cronbach's alpha was only calculated for the sleep disturbance scale, due to there only being one item in the subjective sleep quality component. Previous research found good internal consistencies of .80 (Carpenter & Andrykowski, 1998). In this sample, a Cronbach's alpha of .76 was found.

Child Sleep Quality. Parent reports of children's quality of sleep was also measured to account for its effects on parental sleep quality using the short-form Children's Sleep Habits

Questionnaire (SF-CSHQ; Bonuck et al., 2017). This is a 23-item scale comprised of 6 subscales (Bedtime Resistance, e.g., “Child resists going to bed at bedtime”, Sleep Onset Delay, e.g., “Child falls asleep within 20 minutes after going to bed”, Sleep Duration, e.g., “Child sleeps too little”, Sleep Anxiety, e.g., “Child needs parent in the room to fall asleep”, Night Wakings, e.g., “Child moves to someone else’s bed during the night (parent, sibling, etc.)”, and Daytime Sleepiness, e.g., “Child seems tired during the daytime.”) as well as a global score. It is measured on a 3-point Likert scale (1 = usually, 3 = rarely), whereby higher scores indicate more sleep problems. Good internal consistency has been demonstrated previously with Cronbach’s alpha’s ranging from .68 to .72 (Owens et al., 2000). Here an alpha of .89 was found for the total short-form scale.

Parenting stress. The Parental Stress Scale was used (PSS; Berry & Jones, 1995), and is an 18-item scale measured on a 5-point Likert scale (e.g., “Caring for my child(ren) sometimes takes more time and energy than I have to give”; 1 = Strongly Disagree, 5 = Strongly Agree), for which higher scores indicate more parenting stress. Previously, high internal consistencies have been found (.84; Zelman & Ferro, 2018). In this sample, a Cronbach’s alpha of .91 was found.

Psychological distress. The short-form Depression, Anxiety and Stress Scale (DASS-21; Lovibond & Lovibond, 1995) incorporates three subscales, Depression (e.g., “I couldn't seem to experience any positive feeling at all”), Anxiety (e.g., “I was aware of dryness of my mouth”) and Stress (e.g., “I found it hard to wind down”), measured using a 4-point Likert Scale. Previously, Cronbach’s alphas of .88 for the Depression subscale, .82 for the Anxiety subscale, and .90 for the Stress subscale have been found (Henry & Crawford, 2005). Here, Cronbach’s

alphas of .84 for the Stress subscale, .89 for the Anxiety subscale, and .89 for the Depression subscale were found.

Parent emotion regulation. The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) is a 10-item scale comprising of two subscales (cognitive reappraisal, e.g., "When I want to feel less negative emotions (such as sadness or anger), I change what I am thinking about", and expressive suppression, e.g., "I keep my emotions to myself"), measured on a 7-point Likert Scale (1 = Strongly Disagree, 7 = Strongly Agree). Higher scores indicate a greater use of the respective emotion regulation strategy. Previously, high internal consistency has been found for both the cognitive reappraisal (.90) and expressive suppression (.80) subscales (Preece et al., 2021). Here, Cronbach's alphas of .80 were found for the cognitive reappraisal subscale, and .87 for expressive suppression.

Parent-child relationship. The Child-Parent Relationship Scale (CPRS; Pianta, 1992) was used and is a 15-item scale comprising of two subscales (conflict, e.g., "My child and I always seem to be struggling with each other", and closeness, e.g., "My child values his/her relationship with me"), measured on a 5-point Likert scale. Higher scores indicate either more conflict or more closeness between the parent and child, respectively. The authors originally found a Cronbach's alpha of .84 for the conflict subscale, and .69 for the closeness scale with mothers of four-and-a-half-year-olds (Driscoll & Pianta, 2011). Here, a Cronbach's alpha of .90 was found for conflict, and .87 for closeness.

Self-reported parenting behaviours. These were measured using the Pre-school version of the Alabama Parenting Questionnaire (APQ-PR; Clerkin et al., 2007). This is an adapted version of the standard 32-item APQ scale for parents of pre-school children, including 24 items to measure Positive parenting (e.g., "You volunteer to help with special activities that

your child is involved in"), Inconsistent parenting (e.g., "You feel that getting your child to obey you is more trouble than it's worth") and Harsh parenting (e.g., "You yell or scream at your child when he/she has done something wrong"). Measured on a 5-point Likert scale, higher scores for each respective parenting strategy indicate greater use of that parenting strategy. Previous research has demonstrated adequate internal consistency with a Cronbach's alpha of .82 for positive parenting, .74 for inconsistent parenting, and .63 for harsh parenting (Clerkin et al., 2007). Here, a Cronbach's alphas of .79 was found for positive parenting, .70 for inconsistent parenting, and .29 for harsh parenting.

Household (dis)organisation. This was measured using the short form Confusion, Hubbub and Order Scale (CHAOS; Matheny et al., 1995), consisting of 6-items measured on a 4-point Likert scale, providing a total score whereby higher scores indicate less organisation at home. Items include statements like "You can't hear yourself think in our home". Previously, an adequate Cronbach's alpha of .79 was found (Chatterjee et al., 2015), however, here .63 was found.

Coparenting. This was measured for parents who shared childcare with a co-parent, using the brief measure of co-parenting, comprised of 14-items from the Co-Parenting Relationship Scale (CRS; Feinberg et al., 2012), including statements like "My partner tells me I am doing a good job or otherwise lets me know I am being a good parent". Parents who indicated that they did not co-parent with another adult were not presented with this scale. Each item is measured on a 7-point Likert scale (0 = not true of us, and 6 = very true of us), and higher scores indicate a better co-parenting relationship. Previously, good internal consistency was found for the brief 14-item scale, with alpha's of between .88 and .89 for mothers (Feinberg et al., 2012). Here, a Cronbach's alpha of .65 was found.

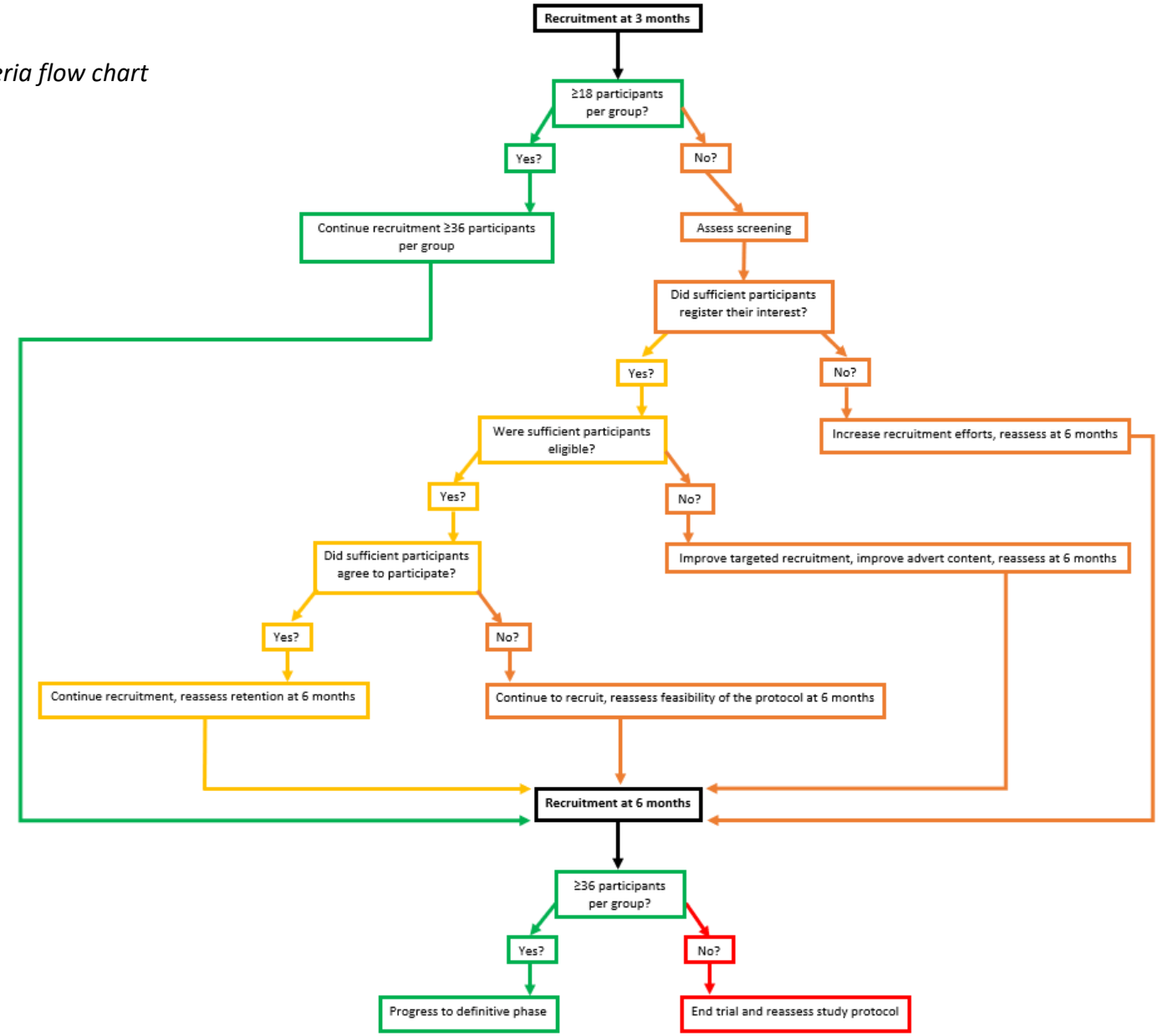
6.4.6 Progression criteria

As an internal pilot trial, recruitment formed the basis of progression from pilot to definitive trial. Progression criteria were informed by rates of recruitment and retention achieved in Project 2, as well as previously reported attrition rates of up to 40% in other research using *Headspace* (Howells et al., 2016; Lim et al., 2015). Up to 12-months was allocated for recruitment in this project, and it was anticipated that given 12 participants were recruited for a single-group, mixed-methods study over the course of 3 months (n = 4 participants per month on average), it would be feasible (due to the absence of qualitative data collection) to increase recruitment to n = 6 participants per group. Over the course of 6 months, this would result in a total N of 108 (36 participants per group), and with a 40% attrition rate, a retained N of 63 (21 participants per group), which power analyses, and previously simulation work (Teare et al., 2014) suggested would be sufficient for the analysis planned for the definitive phase of the trial.

A priori, before recruitment began, it was projected that up to 216 participants would need to be randomised to retain at least 108 participants, however, it very quickly became apparent that this may be unrealistic and recruitment progression criteria were revisited. Therefore, it was determined that if after 6 months, 36 (or more) participants had been randomised to each group (i.e., an average recruitment rate of 6 participants per group per month), the trial would progress to the definitive phase. If by 6 months, less than half of this (i.e., 18 or fewer participants per group, or less than 54 participants in total) had been recruited, a reassessment of the feasibility of the trial was warranted. Figure 6.5 depicts a flow chart representing the revised progression and stop criteria applied to this trial during the two recruitment phases.

Figure 6.5

Progression criteria flow chart



6.4.7 Data analysis plan

This study was pre-registered to report all outcomes descriptively (using means and standard deviations, or frequencies where appropriate), and, for the primary and secondary outcomes, to calculate Hedge's *g* effect sizes for the post-intervention between-group effects, controlling for baseline scores using ANCOVA. However, in the event, recruitment issues meant that the data was not sufficient to perform inferential tests. As such, the data collected from participants is presented descriptively, using means, standard deviations, or frequencies where appropriate, with corresponding Hedge's *g* effect sizes and 95% confidence intervals. Hedge's *g* (Hedges & Olkin, 1985) was used to calculate the effect size for the difference between the treatment and control group means at post-intervention, using the formula:

$$g = \frac{\bar{y}_1 - \bar{y}_2}{S_p}$$

Where $\bar{y}_1$ is the post-intervention mean for the treatment group, and $\bar{y}_2$ is the post-intervention mean for the control group, and S_p is the pooled standard deviation. The pooled standard deviation was calculated using the formula:

$$S_p = \sqrt{\frac{(n_1-1)s_1^2+(n_2-1)s_2^2}{(n_1-1)+(n_2-1)}}$$

Where n_1 and n_2 are the number of observations for the treatment and control groups (respectively), and s_1 and s_2 are the standard deviations for the treatment and control groups (respectively). To calculate the confidence interval, Hedges and Olkin's (1985) formula was used whereby:

$$CI = g \pm 1.96\sqrt{(n_2 + n_1)/(n_2 n_1) + g^2.5/(n_1 + n_2)}$$

and where 1.96 is the normal distribution cumulative density value for the confidence coefficient 95%. Hedge's *g* was used as it is considered preferable for small samples (Lakens,

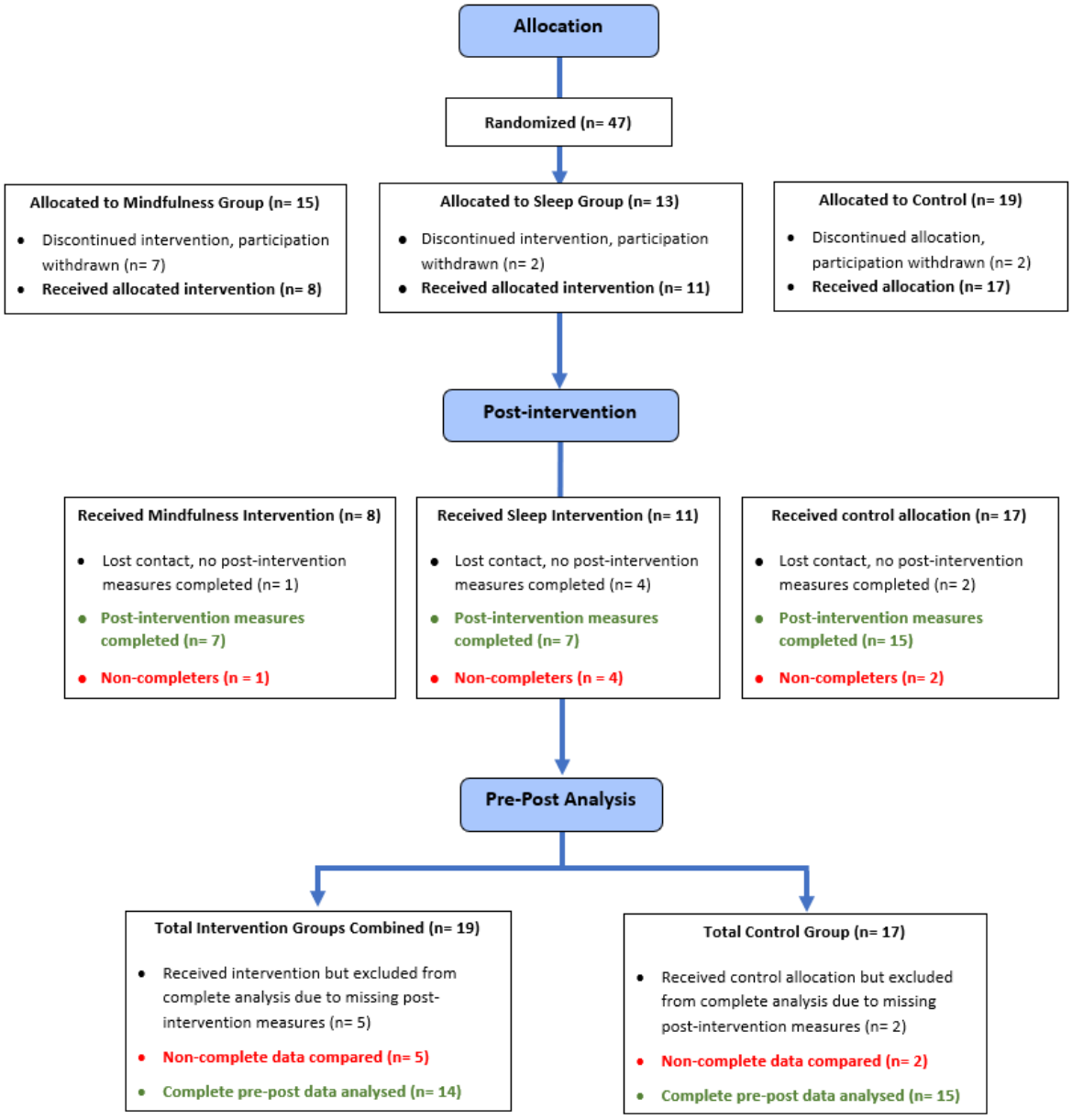
2013), and can be interpreted to mean that .2 indicates a small effect, .5 a medium effect, and .8 or greater, a large effect (Cohen, 1992). All data were analysed using IBM SPSS Statistics v28 for Windows. Although not pre-registered, it was the intention that if the pilot trial had been feasible and progressed to a definitive stage, a mediation analysis of the full model depicted in Figure 6.2 would be conducted. However, inferences were not considered appropriate for this pilot trial.

Recruitment feasibility. Recruitment was slower than anticipated, and the achieved sample size after 6 months did not demonstrate feasibility of procedures. To better understand these effects, data were analysed descriptively. Frequencies of participants excluded per exclusion criteria are presented (see section 6.5.1), as well as the frequencies of participants at each stage of the study procedures by their source of referral into the study.

Retention feasibility. Retention data is presented descriptively (see section 6.5.2), with participant numbers at each stage of the study, also visualised in a flow chart in Figure 6.6. In order to consider demographic differences and differences in primary and secondary outcome measures between study completers and non-completers at baseline, means and standard deviations are presented, and Hedge's *g* calculated (with corresponding 95% confidence intervals) again calculated.

Figure 6.6

CONSORT Flow diagram (Schulz et al., 2010) depicting study completers and non-completers by group from allocation to analysis



Headspace usage data. Originally, there were two planned active intervention groups, as well as the waitlist control group. It was intended to differentiate participants who had been instructed to use only the mindfulness content on the *Headspace* app, and those instructed to use only the sleep content. However, given the small sample size recruited, and the greater attrition seen from the intervention groups (n = 9 withdrew, and a further n = 5 lost to follow up) in comparison to the waitlist control group (n = 2 withdrew, and a further n = 2 lost to follow up), planned comparisons were not appropriate. Instead, to illustrate the differences only, the two intervention groups were compared descriptively, and combined as one group when looking at preliminary effects on the primary and secondary outcomes, using pre-post data only. Dose-response relationships were investigated using Pearson's *r*, correlating the change score for each of the primary and secondary outcomes with the number of sessions completed on the app per group (mindfulness only group, sleep only group, and as one single intervention where the mindfulness instruction and sleep instruction groups are combined).

Preliminary effects on parent and child outcomes. Descriptive comparisons of pre-post questionnaire data (means and standard deviations) were conducted to determine preliminary effects on parent and child outcomes. Effect sizes (Hedge's *g*) and corresponding 95% Confidence Intervals (CIs) for pre-post differences of each outcome measured are also reported. Questionnaire data was collected using the REDCap System hosted at UCL, and were analysed using IBM SPSS Statistics v28 for Windows.

6.5 Results

6.5.1 Recruitment

As recruitment was slow, and protocol adherence was varied, the trial was not deemed feasible to progress to a definitive stage. After 6 months of recruitment, (conducted in two phases between March-May 2021, and November 2021-March 2022), 471 parents had registered an interest in the study, with 50% (n = 236) meeting the inclusion criteria. Of these, only 27% (n = 64) completed a call with the primary researcher.

Table 6.2 presents the frequency of participants per exclusion criteria. The most common reason to be excluded was participants not being resident in the UK (n = 61, 26%), which occurred as a result of the paid social media adverts used to disseminate information about the study. Although adverts were specified to be shown to UK users only, this restriction did not appear to account for the use of Virtual Private Networks (VPNs), for example. The second and fourth most common reasons to be excluded were parents and/or children currently or recently receiving any form of psychiatric or psychological treatment (n = 52, 22%), and parents and/or children having a diagnosed neurodevelopmental and/or mental health disorder (n = 41, 18%). The third most common reason for exclusion was regular and/or recent use of the *Headspace* app (n = 49, 21%). Other reasons accounting for 13% of exclusions (n = 32) included not having a child aged 2-5, and being the parent of twins.

Table 6.2

Frequency of participants excluded per exclusion criteria

Exclusion criteria	**Number of participants excluded, N (%)[a]**
Parents under 18 years of age	-
Parents who do not live with their children for at least 4 days of the week, at least one of which is a school night[b]	-
Parents who do not live in the UK	61 (26%)
Country of residence for 61 excluded participants who did not live in the UK:	Australia (n= 1, 2%) Belgium (n= 3, 5%) Channel Islands (n= 2, 3%) Denmark (n= 2, 3%) Hungary (n= 1, 2%) Ireland (n=5, 8%) Italy (n= 3, 5%) Romania (n= 14, 23%) Spain (n= 7, 11%) Tajikistan (n= 1, 2%) USA (n =2, 3%) Did not record (n=20, 33%)
Parents who do not have children aged 2-5 years old	16 (6.5%)
Have regularly[c] used the *Headspace* app and/or practiced some form of meditation over the last 6 months	49 (21%)
Parent and/or child is currently receiving (or recently[d] received) any form of psychiatric/psychological treatment	52 (22%)
Parents or children with a neurodevelopmental and/or diagnosed mental health disorder	41 (18%)
Parents of twins	16 (6.5%)

Note. Frequency % rounded to integer where possible, or first decimal place to sum 100%

[a] Total N of participants excluded = 235. [b] where appliable for shared custody arrangements. [c] "regularly" is defined here as occurring for at least one month, or more than 4 times in the last 6 months, whichever is the greater. [d] "recently" is defined here as having occurred in the last 6 months.

Measures were taken to increase recruitment, and to promote diversity in the sample, utilising both online and in-person methods where possible. As both phases of recruitment were conducted after stringent lockdown measures ceased in the UK allowing parents access to schools and (variously) some leisure venues (see Figure 6.1 for details), these were included in the places study adverts were distributed. However, remote recruitment—specifically social media posts and paid advertisements—proved to be the most successful method of generating interest in the study. Of the platforms used (including Facebook, Instagram, Twitter, LinkedIn and Nextdoor), participants recruited from Facebook were most likely to complete the study (n = 6, 21%). Fliers were also distributed around local neighbourhoods in London and the South-East, although these, along with posts made on LinkedIn and adverts in various newsletters, were the least successful recruitment strategies (referring no eligible participants into the study). Table 6.3 presents the frequency of participants at each stage of the study by their source of referral into the study.

Table 6.3

Frequency of participants at each stage of recruitment, by source of referral into the study

Source of referral	Total n (%)	Eligible n (%)	Arranged phone call n (%)	Completed baseline measures n (%)	Completed pre-post study n (%)
Email circulars[a]	15 (2%)	10 (4.5%)	7 (11%)	6 (10.5%)	3 (10%)
Facebook[b]	257 (55%)	128 (54%)	12 (19%)	11 (19%)	6 (21%)
Flier[c]	12 (3%)	5 (2%)	-	-	-
Instagram[b]	20 (4%)	11 (5%)	6 (9%)	5 (9%)	4 (14%)
LinkedIn	3 (0%)	-	-	-	-
Nextdoor	13 (3%)	9 (4%)	5 (8%)	4 (7%)	2 (7%)
Newsletters	2 (0%)	-	-	-	-
Personal Networks[d]	22 (5%)	20 (8.5%)	9 (14%)	8 (14%)	4 (14%)
Referral from friend included in study[e]	17 (4%)	15 (6%)	8 (12%)	7 (12%)	2 (7%)
Twitter	56 (12%)	16 (7%)	7 (11%)	6 (10.5%)	3 (10%)
Did not record	54 (11%)	22 (9%)	10 (16%)	10 (18%)	5 (17%)

Note. Total N = 471, Eligible n = 236, Arranged Phone Call n = 64, Baseline measures completed, participation not withdrawn n = 36, Completed Study n = 29.

[a]Includes any email sent on behalf of the study by an external party to their audience, for example, emails sent out by day-care facilities to parents. [b]Including both personal networks, and paid adverts [c]Fliers were posted in various community locations across London and the Southeast, including local libraries, supermarkets, and community centres. [d]Refers to the personal and professional networks of the primary research team. [e]Refers to referrals from parents taking part as participants to other parents in their own personal and professional networks

6.5.2 Retention

Of the 64 parents who arranged a call with the researcher, 57 initially consented to take part in the study. Of these, 10 participants withdrew their consent prior to randomisation, and a further 11 withdrew after randomisation. Of the 21 participants who explicitly withdrew, where reasons were given, it was more common to cite issues with study procedures (n = 14) than with the intervention (n = 3). Issues with study procedures included the time commitment (n = 6), receiving too many or too few study directions (n = 5), having to wait to use the app in the control group (n = 2), and the content of the pre-intervention questionnaire (n = 1). Of the three issues reported with the intervention, one was with privacy concerns regarding app access using a code, and two were related to participant preference regarding content on the app. Of the participants who were not removed from the study due to withdrawing (n = 36), 8 participants received the mindfulness only instructions, 11 received the sleep only instructions, and 17 received the waitlist instructions. Of these, 29 completed post-intervention measures (n = 7 in the mindfulness group, n =7 in the sleep group, and n = 15 in the control group). Overall, following randomisation, a 38% attrition rate was seen—comprised of 15% (n = 7) loss to follow up, and 23% (n = 11) loss to withdrawing.

6.5.2.1 Comparisons between study completers and non-completers

Descriptive comparisons revealed some differences at baseline between study completers (n = 29) and non-completers (n = 7), i.e., those who received the study instructions and where applicable app access codes, but who did not complete post-intervention measures and did not withdraw from the study. Non-completers were more likely to be unemployed (n = 4, 57% compared to n = 1, 3% of completers), and reported more externalising behaviours in their target children (M 158.86, SD 34.51) when compared to

completers (M 111.69, SD 23.91). Non-completers also reported higher levels of depression (M 28.86, SD 11.25, compared to M 11.24, SD 6.62), stress (M 32.57, SD 6.50 compared to M 22.21, SD 8.36) and anxiety (M 20.86, SD 10.12 compared to M 4.14, SD 4.17) symptoms, as well as higher parenting stress (M 57.43, SD 17.56 compared to 43.41, SD 7.74), and made more use of expressive suppression emotion regulation strategies (M 19.43, SD 7.76, compared to 10.66, SD 5.00) than parents who completed the study. All differences were apparent with large effects where the confidence interval did not cross zero. None of the seven non-completers successfully registered the app with the access code they were provided with, and so no usage data is available for comparison. More details can be seen in Table 6.4.

Table 6.4

Comparison of means, standard deviations, and frequencies (N, %) for demographic, primary, and secondary outcome variables between participants who completed post-intervention measures (completers) and those lost to follow up (non-completers)

	Non-completers (N = 7)	**Completers (N = 29)**		**95% CI**	
Demographics	**M (SD) / N (%)**	**M (SD) / N (%)**	***g***	**LL**	**UL**
Parent age	35.86 (5.87)	37.21 (4.12)	0.29	-0.53	1.12
Age at birth of first child	30.71 (6.8)	31.62 (4.22)	0.19	-0.64	1.01
Parent gender (female)	6 (86%)	28 (97%)	-	-	-
Parent ethnicity (white)	7 (100%)	26 (90%)	-	-	-
Marital status					
Married living together	4 (57%)	17 (59%)	-	-	-
Cohabiting	1 (14%)	5 (17%)	-	-	-
Married living apart	-	3 (14%)	-	-	-
Single	1 (14%)	4 (10%)	-	-	-
Divorced	1 (14%)	-	-	-	-
Employment status					
Employed/self-employed	3 (43%)	26 (90%)	-	-	-
Hours worked per week	20.67 (16.77)	28.37 (9.78)	-	-	-

Student	-	2 (7%)	-	-	-
Unemployed	4 (57%)	1 (3%)	-	-	-
More than one child at home	5 (71%)	18 (62%)	-	-	-
Hours of weekly childcare (per week)[a]	17.14 (13.80)	25.10 (14.78)	0.53	-0.30	1.37
Child age	2.86 (1.22)	3.10 (.82)	0.26	-0.57	1.09
Child gender (male)	3 (43%)	15 (52%)	-	-	-
Child ethnicity (white)	7 (100%)	24 (83%)	-	-	-
COVID-19					
COVID-19 Exposure	6.29 (9.41)	8.45 (5.82)	0.32	-0.51	1.15
COVID-19 Impact	33.29 (6.60)	29.76 (5.24)	-0.63	-1.47	0.21
Children's outcomes					
Externalising behaviours (ECBI)	158.86 (34.51)	111.69 (23.91)	-1.77	-2.69	-0.85
Prosocial behaviours (SCS)	15.43 (5.86)	18.69 (3.86)	0.74	-0.10	1.59
Emotion regulation (SCS)	14.00 (8.77)	15.62 (3.43)	0.33	-0.50	1.16
Sleep outcomes					
Parental Self-rated Sleep Quality (PSQI)	2.71 (.76)	2.72 (.80)	0.01	-0.81	0.84
Parental Sleep Disturbance (PSQI)	17.00 (3.96)	17.86 (3.90)	0.22	-0.61	1.04
Child's sleep habits (CSHQ)	51.14 (12.52)	56.79 (7.11)	0.66	-0.18	1.50
Parent outcomes					
Mindfulness (FFMQ15)	2.81 (.85)	3.15 (.59)	0.52	-0.32	1.35
General Stress (DASS-21)	32.57 (6.50)	22.21 (8.36)	-1.26	-2.13	-0.38

Anxiety (DASS-21)	20.86 (10.12)	4.14 (4.17)	-2.87	-3.93	-1.81
Depression (DASS-21)	28.86 (11.25)	11.24 (6.62)	-2.26	-3.23	-1.28
Emotion Regulation (ERQ - Cognitive Reappraisal)	24.57 (8.92)	27.45 (5.84)	0.43	-0.40	1.27
Emotion Regulation (ERQ - Expressive Suppression)	19.43 (7.76)	10.66 (5.00)	-1.53	-2.43	-0.64
Parenting Stress (PSS)	57.43 (17.56)	43.41 (7.74)	-1.35	-2.23	-0.46
Parenting outcomes					
Co-parent Relationship (CRS)	45.60 (8.11)	38.88 (8.16)	-0.81	-1.65	0.04
CHAOS	14.86 (1.95)	15.69 (2.78)	0.31	-0.52	1.13
Positive Parenting (APQ9 – PR)	47.86 (9.03)	53.48 (4.69)	0.96	0.11	1.82
Inconsistent Parenting (APQ9 – PR)	17.57 (5.97)	15.86 (4.09)	-0.37	-1.20	0.46
Harsh Parenting (APQ9 – PR)	9.57 (3.87)	8.31 (1.58)	-0.57	-1.40	0.27
Child-parent relationship Conflict (CPRS)	29.14 (12.95)	20.24 (6.11)	-1.12	-1.99	-0.26
Child-parent relationship Closeness (CPRS)	24.00 (10.52)	30.17 (5.00)	0.95	0.10	1.81

[a] Number of hours the target child is in childcare outside of the home, per week

6.5.3 Headspace usage data

Table 6.5 presents the *Headspace* usage data for the intervention group as a whole (n = 14), and separated by participants who received mindfulness-only content instructions (n =7) or sleep-only content instructions (n = 7). Usage data for two of the participants who completed the study were not recorded—it is not known whether the codes malfunctioned, or whether the participants did not attempt to register the code. Of those whose usage data was recorded (n = 12), the mean number of sessions completed in the mindfulness group (16.14, SD 12.13) was slightly lower than in the sleep group (19.57, SD 22.66), and similarly, the number of days the app was used (out of the requested 30 days) was slightly lower in the mindfulness group (M 13, SD 10), compared to the sleep group (M 15, SD 15). The duration of time participants spent using the app (measured in hours) was almost five times as long in the sleep group (M 9.74, SD 0.13), as it was in the mindfulness group (M 2.42 hours, SD 2.48), as a result of the type of content accessed. Most of the sleep sessions lasted for 45 minutes, whereas the longest mindfulness session completed was 20 minutes.

Table 6.5

Descriptive Headspace app usage data (M, SD, range) for participants in the intervention group in Project 3, by type of content randomly allocated post baseline measures

	Full intervention sample			Mindfulness			Sleep		
	M	**SD**	**Range**	**M**	**SD**	**Range**	**M**	**SD**	**Range**
Number of intervention days completed[a]	14.14	12.28	0-40	13	10	0-30	15	15	0-40
Number of sessions completed	17.86	17.55	0-65	16.14	12.13	0-33	19.57	22.66	0-65
Duration (hours)[b]	4.13	5.88	0-18.53	2.42	2.48	0-6.26	5.84	7.88	0-18.53

Note. N = 14 (Mindfulness n = 7, Sleep n = 7), however, two participants either didn't register the app with the code, or their codes malfunctioned (one from each group). Therefore, usage data actually reflects N = 12 (Mindfulness n = 6, Sleep n = 6).

[a] Participants were asked to use 30 days' worth of content on the app, but they were given 40 days to do so

[b] Total duration of app use during the 40-day intervention period, in hours.

6.5.3.1 Dose-response relationships: comparisons between mindfulness and sleep groups

The difficulties with recruitment and retention resulted in unanticipatedly low numbers of participants in each of the two intervention groups (n = 7 in the mindfulness group, and n = 7 in the sleep group), and therefore they were combined for the purposes of analysing the pilot trial data collected. However, in the original plans, these two groups were intended to be analysed separately and compared. As such, in order to better understand the patterns in dose-response relationship between the two groups' use of the app, on the primary and secondary outcomes measured, Pearson's R correlations were calculated for the mindfulness and sleep groups independently and the two groups combined, correlating the number of sessions used on the app with change scores for each outcome variable.

The results of the mindfulness group, the sleep group, and the combined group are available in Table 6.6. Whilst it is important to bear in mind the very small number of participants included, and the large confidence intervals, when the two intervention groups were combined, there was a small correlation (r = 0.22) between the number of sessions used, and change scores for the primary outcome of children's externalising behaviours, measured using the ECBI. There were, however, some differences noted between the two intervention groups, most notably that there was a large correlation between the number of sessions completed and change scores for the ECBI in the mindfulness group (r = 0.62), which was not apparent for the sleep group (r = 0.08). In terms of secondary outcomes, there was also a larger relationship between number of sessions completed and change scores for parents general stress (measured using the DASS-21) in the mindfulness only group (r = -.62), in comparison to the sleep only group (r = -0.14). This also applies to dispositional mindfulness, whereby there was a correlation of r = 0.56 in the mindfulness only group, where no correlation was present for the sleep group (r = 0.00).

Table 6.6

Mindfulness only, sleep only, and combined intervention groups correlations between the number of sessions completed on the app and change scores for each outcome variable

Change score variable	Mindfulness only (N = 7)	Sleep only (N = 7)	Combined (N = 14)
Parent wellbeing			
FFMQ-15 (mindfulness)	0.56	0.00	0.17
DASS-21 Stress	0.07	0.09	0.13
DASS-21 Anxiety	0.29	-0.36	-0.12
DASS-21 Depression	0.33	-0.17	0.05
Subjective sleep quality	-0.38	0.30	0.09
Sleep disturbance	0.22	-0.31	-0.09
ERQ Cognitive Reappraisal	0.59	0.49	0.47
ERQ Expressive Suppression	0.52	-0.52	-0.20
Parenting			
Parenting stress	-0.62	-0.14	-0.23
Co-parenting relationship	-0.37	0.14	-0.04
Positive parenting	0.43	0.17	0.21
Inconsistent parenting	0.04	-0.45	-0.28
Harsh parenting	-0.49	0.10	-0.11
Household CHAOS	-0.12	-0.15	-0.16
Child-parent conflict	-0.10	0.47	0.21
Child-parent closeness	-0.25	0.31	-0.07
Child wellbeing			
ECBI (externalising issues)	0.62	0.08	0.22
SCS prosocial behaviour	0.57	0.05	0.21
SCS emotion regulation	-0.43	0.02	-0.11
Sleep health problems	-0.31	0.30	0.15

Note. Two participants either didn't register the app with the code, or their codes malfunctioned (one from each group). Therefore, whilst change scores reflect N = 14 (Mindfulness n = 7, Sleep n = 7), the usage data more accurately reflects N = 12 (Mindfulness n = 6, Sleep n = 6).

6.5.4 Participant characteristics

Of the study 'completers', i.e., parents who completed pre- and post- intervention measures (n = 29), most were female (n = 28, 97%), White (n = 26, 90%), and cohabiting with their partner or spouse (n = 22, 76%). Parents were on average 37.21 years old (SD 4.12), the majority were employed or self-employed (n = 26, 90%), and had two children living with them (n = 17, 59%). The target children of participants were balanced by gender (male n = 15, 52%) with a mean age of 3.10 years (SD 0.82). All measured demographic characteristics are available in Table 6.7.

Table 6.7

Sociodemographic characteristics of participants in Project 3 at baseline (T1)

Baseline characteristic	*Headspace*		Waitlist control		Full sample	
	M/n	**SD/%**	***M/n***	**SD/%**	***M/n***	**SD/%**
Parents	36.86	4.33	37.53	4.03	37.21	4.12
Age						
Age at birth of first child	31.79	4.19	31.47	4.39	31.62	4.22
Gender (n, %)						
Female	14	100%	14	93%	28	97%
Male	-	-	1	7	1	3%
Ethnicity (n, %)						
White	14	100%	12	80%	26	90%
Asian	-	-	1	6.5%	1	3.3%
Mixed	-	-	1	6.5%	1	3.3%
Other	-	-	1	6.5%	1	3.3%
Marital status (n, %)						
Married living together/cohabiting	12	86%	10	67%	22	76%
Married living apart	1	7%	2	13%	3	10%
Single	1	7%	3	20%	4	14%
Employment status (n, %)						
Employed or Self-employed	13	93%	13	87%	26	90%
Hours worked per week (M, SD)	25.65	11.21	31.08	7.59	28.37	9.78
Student	-	-	2	13%	2	7%
Unemployed	1	7%	-	-	1	3%
Hours of weekly childcare (per week)[a]	20.04	13.39	29.83	13.84	25.10	14.28
Total number of children living at home (n, %)						
One	7	50%	4	27%	11	38%
Two	6	43%	11	73%	17	59%
Three	1	7%	-	-	1	3%
Children						
Age	3.07	.62	3.13	.99	3.10	.82
Gender (n, %)						
Male	5	36%	10	67%	15	52%
Female	9	64%	5	33%	14	48%
Ethnicity						
White	14	100%	10	67%	24	83%
Asian	-	-	1	6.5%	1	3.5%
Mixed	-	-	3	20%	3	10%
Other	-	-	1	6.5%	1	3.5%
Family Exposure to COVID-19[b]	10.14	5.46	6.87	5.87	8.45	5.82
Impact of COVID-19 on the family[b]	28.86	4.50	30.6	5.88	29.76	5.24

Note. N = 29 (Intervention *n* = 14, Control *n* = 15). Target child age range 2-5 years old. Frequency % rounded to integer where possible, or first decimal place to sum 100%

[a] Number of hours the target child is in childcare outside of the home, per week. [b] Higher scores reflect greater exposure to, or a greater impact of, COVID-19 on the family pre-intervention.

6.5.5 Preliminary effects of Headspace on key outcomes

Primary and secondary outcome data were not analysed according to type of intervention instruction received as planned, but were instead analysed as intervention group (n = 14) and control group (n = 15) due to the small sample size and similarities between the two groups when compared on baseline and demographic measures. Table 6.8 presents the unadjusted means and standard deviations for the intervention group and control group for each of the primary and secondary outcomes, Hedge's *g* effect sizes and associated 95% Confidence Intervals (CIs). No outliers were removed from the analysis because the sample size was small, and no obvious outlying results were identified from a visual inspection of the data. Furthermore, the small sample size and pilot nature of the trial means that no analyses can be generalized beyond the very small sample collected here, and results are only reported for the purposes of aiding planning of more a robust trial going forwards.

Small effect sizes were found for the primary outcome (children's adjustment – externalizing behaviour problems; *g* = -0.29) with a large confidence interval (CI) (95% CI = -0.83, 0.25). Similarly small effect sizes with correspondingly large CIs were found for children's internalizing problems (*g* = 0.34, 95% CI -0.30, 0.98), parents general stress (*g* = -0.32, 95% CI -0.99, 0.35), parenting specific stress (*g* = -0.18, 95% CI -0.91, 0.20), positive parenting behaviours (*g* = 0.12, 95% CI -0.54, 0.78), and the closeness of parent-child relationships (*g* = 0.21, 95% CI -0.24, 0.66). Negligible effects were found for parental mindfulness (*g* = 0.04, 95% CI -0.52, 0.59) and household disturbance (*g* = 0.09, 95% CI -0.50, 0.68). Moderate effects with large confidence intervals were found for parents' emotion regulation (specifically cognitive reappraisal, *g* = 0.58, 95% CI -0.12, 1.28), reductions in inconsistent parenting practices (*g* = -0.53, 95% CI -1.05, 0.00), and improved parental subjective sleep quality (*g* = -0.76, 96% CI -

1.46, -0.03). Large effects, also with large confidence intervals, were found for reductions in parental sleep disturbance (*g* = -1.53, 95% CI -2.34, -0.72), and parent-reported children's sleep quality (*g* = -1.05, 95% CI -1.72, -0.38), indicating potential improvements in both parents' self-reported, and parent-reported children's quality of sleep from pre- to post- intervention.

Table 6.8

Means and standard deviations with corresponding Hedge's g and 95% confidence intervals for each outcome at baseline (T1) and post-intervention (T2) by group

Measure	T1 (Baseline)				T2 (Unadjusted)						
	Headspace (N = 14)		Waitlist (N = 15)		*Headspace* (N = 14)		Waitlist (N = 15)		ES	*95% CI*	
	M	SD	M	SD	M	SD	M	SD	*g*	LL	UL
Primary											
Children's adjustment – Externalising Behaviours	105.36	28.33	117.60	17.90	105.00	16.42	114.33	16.85	-0.54		
ECBI Intensity										-1.29	0.20
Secondary											
Children's adjustment – Social Competence	18.00	2.42	19.33	4.84	20.57	2.53	20.07	3.69	0.15		
SCS – Prosocial behaviours/communication	15.07	2.59	16.13	4.09	16.29	2.52	17.40	2.47	-0.43	-0.58	0.88
SCS – Emotion Regulation										-1.17	0.30
Parental mindfulness											
FFMQ15 – Total	3.20	.48	3.10	.56	3.28	.34	3.21	.39	0.19	-0.54	0.92
Parental Sleep Quality											
PSQI – Sleep disturbance	19.21	4.58	16.60	2.72	12.93	2.67	17.53	3.70	-1.38		
PSQI – Subjective sleep quality	2.86	.86	2.60	.74	2.00	.39	2.47	.83	-0.70	-2.19 -1.45	-0.57 0.05
Parents general stress											
DASS21 – Stress	24.71	7.79	18.53	6.35	18.43	8.12	18.27	6.32	0.02	-0.71	0.75

Parenting stress	41.71	9.14	45.00	6.07	42.21	9.86	42.20	5.78	0.00	-0.73	0.73
PSS – Total											
Parental emotion regulation											
ERQ – Cognitive reappraisal	28.14	3.86	26.80	7.31	26.21	6.80	29.33	5.22	-0.50	-1.24	0.24
ERQ – Expressive suppression	10.57	5.23	10.73	4.96	11.36	4.55	11.20	3.82	0.04	-0.69	0.77
Parenting behaviours											
APQ9-PR – Positive parenting	53.79	5.10	53.20	4.43	53.79	4.50	53.07	4.53	0.15	-0.57	0.88
APQ9-PR – Inconsistent	14.29	4.10	17.33	3.62	14.42	3.98	15.13	3.64	-0.18	-0.91	0.55
parenting	7.64	1.08	8.93	1.75	7.43	1.45	8.27	2.12	-0.45	-1.18	0.29
APQ9-PR – Harsh parenting											
Parent-child relationship											
CPRS – Closeness	31.43	4.18	29.00	5.55	31.29	2.40	28.87	6.05	0.50	-0.24	1.24
CPRS – Conflict	17.7	5.86	22.6	5.51	18.71	4.25	21.20	5.83	-0.47	-1.21	0.27
Harmony at home											
CHAOS-6 – Total	15.93	2.59	15.07	3.06	17.00	3.21	16.33	2.19	0.24	-0.49	0.97
Children's sleep habits											
SF-CSHQ – Total	60.36	5.67	53.67	7.40	55.57	6.12	57.00	6.75	-0.22	-0.95	0.52

6.6 Discussion

Previous research has demonstrated that mindfulness interventions, including remote self-delivered apps, may be effective at reducing parenting specific and general stress (Burgdorf et al., 2019; Burgess et al., 2022; Taylor et al., 2021). However, whilst the digital MBI evidence base is growing in general populations, there is a paucity of research involving parents. The current study extended a previous mixed methods feasibility study—demonstrating the feasibility and acceptability of *Headspace* with parents of young children—to investigate the feasibility of an RCT testing effects of the app for 30 days to improve children's externalising behaviour problems and secondarily, children's internalising problems, parental wellbeing, and parenting practices.

Recruitment was slow, and protocol adherence varied—of the 236 who registered interest and were eligible, only 64 parents (27%) completed a phone call with the researcher. Of parents who completed baseline measures and were randomised (n = 47), only 29 completed post-intervention measures (62%). Although adherence to the app was varied, on average across both groups, participants completed just under half of the intended 30-day intervention (mean number of days the app was used for = 14, SD 12). In terms of preliminary effects, limited effects of using the *Headspace* app were found on parent reports of children's externalising problems, or on parents' stress (either general or parenting specific). Promising effects in the hypothesised direction were, however, found for reductions in parents' sleep disturbance, improvements in parents' self-reported sleep quality, and improvements in parent-reports of children's sleep quality. These results are discussed in the context of prior literature, but it is important to emphasise the need for caution due to the issues with

recruitment and the small, homogenous sample. Accordingly, confidence intervals for effect sizes are large.

6.6.1 Findings in context

In a variety of other populations, mindfulness has been demonstrated to improve perceptions of stress, emotion regulation, and self-efficacy (Klingbeil & Renshaw, 2018; Lomas et al., 2018, 2019). More specifically for families, previous work suggests that mindfulness interventions delivered to parents can have small effects on improving children's outcomes (Burgdorf et al., 2019). However, in this study, limited effects were found for both internalising and externalising child outcomes measured, as well as for parental mindfulness, general and parenting specific stress, parental emotion regulation, parenting behaviours, and the home environment.

Although analyses were restricted by recruitment and retention issues, it is of note that this is reflective of other recent work using mindfulness-based apps with parents. For example, one planned RCT investigating the *Smiling Mind* app with parents of children with autism encountered such difficulties with recruitment and retention that the trial was stopped and semi-structured interviews were conducted instead to investigate barriers to participation (Hartley et al., 2022). In another study which aimed to investigate the *Headspace* app with parents, only 33% of eligible participants (n = 16) enrolled in the study, of whom, only half completed the intervention (n = 8) (Militello et al., 2022).

In this study, it may be the case that recruitment was hampered by study 'marketing' strategies. For example, only 50% (n = 236) of parents who registered an interest in the study were eligible. Specifically, 40% of interested parents were ineligible due to either current or recent psychological treatment, or themselves or their child having a diagnosed

neurodevelopmental and/or mental health disorder. This may not be surprising given the study was advertised specifically for parents struggling with stress, which is known to co-occur with mental health disorders (Cohen et al., 1991), and to be higher in parents of neurodivergent children (Craig et al., 2016). Another criteria where a relatively large number of interested participants were ineligible was recent or regular use of the *Headspace* app (n = 49, 21% of parents excluded), which again may not be surprising given that study adverts included large *Headspace* branding and were specifically targeted at parents who may have had an existing interest in the app (e.g., in positive parenting Facebook groups). Similarly, the relatively high number of twin-parents who were interested in the study (n = 16, 6.5% of parents excluded for this reason) may have been a result of the avenues of advertising used. I.e., due to the use of personal and professional social media networks in spreading information about the study, whereby one of the supervisors of the project has previously worked extensively on a twin-based research project and may be understood to have relatively more twin contacts than others who haven't worked so closely with these families.

In terms of retention and adherence, parental use of the app and retention to the measures in this study broadly reflects that of other studies using *Headspace* in general population samples. I.e., that parents used just under half of the app content they were directed to use (M 14 days, SD 12 out of the requested 30), and a 38% attrition rate was seen after randomisation. A review by Liptáková et al. (2022) found in pre-pandemic samples that participants used less than half of the *Headspace* content they are asked to use, and in general population samples, attrition rates from *Headspace* have been reported to range from 20 to 40% (Noone & Hogan, 2016).

In terms of preliminary effects, despite sample limitations, there were promising reductions in parental sleep disturbance and improvements in children's sleep. This may suggest when used by parents, *Headspace* could potentially be a useful tool to improve child outcomes via improvements in sleep, as a recent meta-analysis suggests amongst other benefits, improving parents' and children's sleep can also improve within-family relationships (Gordon et al., 2021). However, there is a lack of literature investigating interventions designed to target only parents sleep quality where no diagnosed sleep disorders are present (Murawski et al., 2018)—with most interventions focusing on improving children's sleep patterns—and therefore it is difficult to contextualise these findings with parents specifically in the sleep literature.

6.6.2 Mindfulness, parent and child wellbeing, and sleep

Sleep has long been recognised as key to both good physical and mental health, including stress management (Murawski et al., 2018). Although there have been few interventions aimed at improving adults sleep health where no diagnosable sleep disorders are present, whether parents or not, and as such this presents a worthwhile and potentially very beneficial avenue of future research (Murawski et al., 2018). Perhaps even more so for parents, who qualitatively reported that it was easier to fit daily use of the *Headspace* app into their routines at bedtime when their children were already asleep, perhaps lending the app to be a sleep-orientated intervention (Burgess et al., 2022). In terms of the different content available on *Headspace*—with caution warranted due to very small sample sizes—when compared separately, it is interesting to note the stronger relationships between the number of sessions completed and parent and child wellbeing outcomes (including sleep,

mindfulness, depression, stress, parenting, and child behaviour problems) for the mindfulness group more so than the sleep group.

The greater dose-response relationship noted in the mindfulness only group compared to the sleep only group between the number of sessions completed on the app, and change scores for children's externalising problems may have important implications for the proposed mechanism of action of parent-directed MBIs on child outcomes. The correlations of r = 0.62 (mindfulness group) in comparison to r = 0.08 (sleep group) may suggest that although parents sleep might have improved as a result of using *Headspace*, it is via mindfulness practice, rather than the sleep content that more widespread improvements may have occurred. This may be unsurprising given the content of the sleep sessions on the app, which, whilst informed by mindfulness more broadly, do not include guided mindfulness practice nor do they teach meditative skills, and therefore the sleep content when used alone is not directly comparable to an MBI.

Further to this, the greater relationship in the hypothesised direction between app use and change scores in subjective sleep quality (where lower scores indicate better quality of sleep) in the mindfulness group (r = -0.38) in comparison to the sleep group (r = 0.30), indicate that perceptions of improved sleep may also have been a result of mindfulness practice, not the use of *Headspace* sleep content as a sleep aid. Mindfulness has been theorised to target many of the cognitive patterns that contribute to poor sleep, including, for e.g., rumination (Pillai & Drake, 2015). Mindfulness has also been demonstrated to improve sleep quality in a variety of contexts, however, a recent meta-analysis comparing it to evidence-based sleep treatments (including prescription medication and CBT for Insomnia) did not find any effect (Rusch et al., 2019). Although caution was advised with this conclusion as the quality of

evidence was reported to be low, the same may be said of mindfulness interventions more broadly, not just those targeted to improve sleep, which does not preclude the utility of future research to better investigate these effects.

In terms of research investigating digital MBIs, a recent pilot RCT including 300 working adults without a diagnosed sleep disorder, tested the effects of the digital platform *Unmind*, and found effects sizes between *g* = .92 and *g* = 1.09 for improvements in sleep disturbance (Economides et al., 2023). Another mindfulness app, *Calm* (of similar popularity and reach to *Headspace*; O'Daffer et al., 2022), was tested in an RCT with 236 adults with insomnia, finding that *Calm* significantly decreased daytime fatigue (*d* = 0.26) as well as cognitive pre-sleep arousal (*d* = 0.26) (Huberty et al., 2021). Although these studies were not conducted with parents as was the case here, the results seen in this sample are in line with these findings, and as such add to the promise of digital MBIs for improving sleep in adults.

In terms of children's sleep, the picture may be a little less clear as there are developmental-stage specific issues with measurement accuracy. For children who are young enough that their parents report on their sleep habits, this report is one-step removed from the child experiencing the sleep being reported on. Research investigating heritability estimates of sleep via self-report, parent-report, and polysomnography, suggests results using different methods vary substantially pointing to the inaccuracy of parent-reported sleep measures (Kocevska et al., 2021). This is in line with older research suggesting that over 20 years of sleep measures research indicates parent-reports of sleep are less consistent for measuring sleep duration, night wakings and sleep onset latency in children (Bauer & Blunden, 2008). This is significant for this study as the children's sleep quality measure included items from scales measuring all these aspects of child-sleep habits. Whilst it was

beyond the scope of this study to implement polysomnography, the potential for parental biases in these measures is important to consider. The effects in this study may therefore be more reflective of parent perceptions of improvements in their child's sleep rather than objectively measurable improvements for the children themselves, which is arguably as important for the parent experience of it, as objective improvements may be.

Improving sleep may also be a particularly pertinent issue for the sample included in this study due to the effects of COVID-19. In young children especially, sleep problems are known to be common (Richdale & Schreck, 2019), in part as a result of changing sleep schedules as daytime naps reduce in frequency and duration, and in part as a result of night wakings (Galland et al., 2012). Already a challenge, data from a cross-sectional survey in Italy during the pandemic demonstrated that COVID-19 had detrimental effects on children's sleep/wake patterns with increased delays in bedtime and a higher prevalence of anxiety at bedtime and night awakenings from nightmares (Bruni et al., 2022). These findings may also provide an alternative explanation for the improvements noted in children's sleep outcomes here, as restrictions were gradually lifted, until completed removed in the UK by the end of data collection.

6.6.3 Research implications

An important aspect of this research was attrition and adherence to the app. Research using *Headspace* in more general populations reports attrition rates from baseline to follow-up ranging from 20 to 40% (Noone & Hogan, 2016). None of these samples involved parents of young children, however, for whom attrition might be predicted higher. For example, a recent review of digital parenting-specific interventions found attrition rates ranged from 30 to 50% (Hall & Bierman, 2015), and more recent research using *Headspace* with parents found

recruitment and retention to be uniquely challenging (Militello et al., 2022). Here, recruitment and retention pre-randomisation proved to be the most challenging aspects of the protocol—with 73% of eligible participants not engaging with the first step of the study (call with the researcher), and 50% (n = 10) of those who withdrew doing so prior to randomisation. The post-randomisation attrition rate of 38% is, however, comparable to similar literature investigating *Headspace* (Noone & Hogan, 2016).

It is also interesting that differences were noted between the completers and non-completers in this study which are not consistent with attrition patterns in the wider digital parenting-intervention literature (Dadds et al., 2019), although they are broadly consistent with the previous mixed methods study using *Headspace* reported here in Chapter 6. In terms of the broader parenting intervention literature, a pre-COVID-19, Australia-wide study implementing an online positive parenting intervention found that contrary to face-to-face research, parents of children with more behavioural problems were more likely to complete the intervention than parents of children with fewer problems, suggesting that parents in greater need engaged better with online support programmes (Dadds et al., 2019). In this sample, however, the non-completers were more likely to have children with more behavioural difficulties and reported experiencing greater parenting stress than those who completed the study, suggesting that they did not continue to engage with the intervention for parenting-related reasons. It may therefore be the case that, similarly to the mixed methods findings, participants in Dadds et al. (2019) sample were keen to engage with a parenting-specific intervention as they needed parenting-specific help, however, here, *Headspace* may not have met parents' perceptions of their need for parenting-specific support.

In addition to this, the post-COVID-19 climate in which recruitment was conducted is also worth considering. RCTs often face issues of slow recruitment and high attrition, as well as poor adherence to interventions, all of which may be said to have been exacerbated by the effects of COVID-19 (Knowlson et al., 2023). Furthermore, whilst the impact of the initial lockdowns may have subsided, it can be argued that COVID-19 has brought about enduring societal change which may continue to affect participant recruitment and retention in mental health trials (Türközer & Öngür, 2020). For example, according to the Office for National Statistics (2022a), as of February 2022, only 8% of workers who were made to work from home during lockdowns intend to return to the office in the future. This may affect recruitment, particularly of parents who have to coordinate home working and childcare alongside participation, and may have been a pertinent issue for our majority employed sample. I.e., given the social and financial resources required to successfully balance home working and childcare, a more homogenous group of largely White, employed, married participants were able to give their time to this study.

Conversely, it is important to recognise that remote methods can break down barriers to participation, mitigating the time and engagement required for busy, stressed families to become involved in research (Skeens et al., 2022). However, care and consideration needs to be taken with post-COVID-19 protocols (Cooksey et al., 2022), which this study may have inadvertently thwarted while intending to improve participant engagement. For example, a major source of attrition in this study from interested and eligible participants to baseline measures being completed, was the introductory call with the primary researcher—73% of eligible participants did not proceed at this stage. Although this was implemented as a result of feedback from the previous qualitative work whereby participants appreciated knowing and "meeting" the researcher collecting their data (thereby increasing their engagement with

the intervention), it may have proved a stumbling block for recruiting larger numbers of participants in a short period of time, with increasing demands on parents' time post-lockdowns.

6.6.4 Strengths and limitations

The generalisability and utility of this study was severely limited by issues of recruitment and retention of participants—specifically, only a small, relatively homogenous group of mothers was recruited over a period of 6 months. Although this study failed to address the gender imbalance of parents, there was a more balanced gender of children than has previously been reported in MBIs in parenting (Burgdorf et al., 2019). This study was also the first of its kind to test the *Headspace* app in an internal pilot RCT design with two active intervention arms for parents of typically developing young children, and suggests that there may be some utility in designing a more feasible protocol to better test the preliminary effects on sleep found in this sample.

6.6.5 Conclusion and implications

In conclusion, this study did not demonstrate that a three-armed RCT of *Headspace*, using the protocol described and the available resources, was feasible, nor that it was effective at improving children's adjustment outcomes, or perceptions of stress for parents of young children in the UK. However, given the comparatively small number of issues reported with the app itself (n = 3), compared with the study protocol (n = 14), it may be reasonable to assume *Headspace* remains acceptable to parents when delivered as part of an RCT design. Of parents who completed the pre- and post- intervention measures, *Headspace* may have had some effects on improving parents' perception of both their and their children's sleep, however, any interpretation of these effects must be cautious. The pilot phase reported

here was never intended to provide inferential results, the sample size is small and homogenous, and the confidence intervals are large. However, this pilot trial did provide preliminary support for previous qualitative findings regarding benefits for sleep, and is line with other research utilising digital MBIs to improve sleep. It has also highlighted important difficulties with recruitment with the given resources, and a potential need for parenting support unmet by the app for parents who did not complete the intervention. Given the small but promising effects on sleep that build on previous findings, future research might benefit from investigating the link between parental use of the app, improvements in sleep, and children's adjustment outcomes more robustly.

CHAPTER 7

General discussion

This thesis presented three main research projects which together aimed to examine the acceptability, feasibility, and effectiveness of delivering mindfulness via a smartphone app to parents of young children. The specific findings, limitations, and implications of each project have been discussed in detail in Chapters 3 to 7, and will not be repeated here. This general discussion is intended to synthesise the findings and consider key themes and implications arising from the research as a whole. Therefore, this chapter will provide a brief summary of the findings, discuss themes and implications, acknowledge strengths and limitations of the research, and posit future directions for mindfulness in parenting research.

7.1 Summary of findings

This thesis had four overarching aims:

i) Investigate the direction and magnitude of effects of MBIs delivered to parents aiming to reduce parental stress and improve child adjustment.

ii) Examine the acceptability of delivering a digital MBI to parents of young children via a commercially available smartphone app (*Headspace*).

iii) Understand the feasibility of studies testing the effects of giving the *Headspace* app to parents of young children.

iv) Explore the preliminary effects of parental use of *Headspace* on children's outcomes via the mechanisms of reducing parental stress, improving parental wellbeing, and improving parenting practices.

Project 1 (Chapter 3) synthesised 22 RCT studies which investigated the effects of MBIs on parental stress and/or children's adjustment outcomes. This study advanced a previous systematic review (Burgdorf et al., 2019), and was the first to include both digital and in-person interventions, delivered to both parents only, and parents and children in parallel. Results suggested that MBIs had a moderate effect for reducing parental stress (g = -0.36), and small effects for improving children's adjustment outcomes (g = -0.15). However, whilst effects for parental stress and children's externalising problems were robust to sensitivity analysis, children's total problems and internalising problem outcomes were not. Furthermore, all studies included were at either moderate or high risk of bias, and few studies investigated children's internalising problems leading to power issues with the meta-analysis. Despite these limitations, this study makes an important contribution to the limited literature base by incorporating only RCTs, and robustly testing the effects of MBIs on multiple parent and child outcomes. Conclusions were that MBIs are a potentially effective intervention for reducing parental stress and improving children's externalising problems, with more rigorously designed RCTs now needed. An updated review with a narrative synthesis of the literature investigating MBIs delivered to parents during COVID-19 to improve parent and/or child outcomes is available in Appendix O.

Although not directly comparable due to the differences in synthesis methodology, and the divergent designs of included studies (RCTs only in Chapter 3, and pre-post, single-group pilot studies in Appendix O), there were some noticeable differences between the pre-pandemic literature and the post-pandemic literature investigating MBIs delivered to parents. Specifically, studies conducted during the pandemic were more likely to report on home practice (75% compared to only 32% pre-pandemic), and were focused on younger (all four studies synthesised), and mostly typically developing children (75% in comparison to 23% pre-

pandemic). Although, again, comparisons are cautious due to the much larger number of larger RCT studies available to synthesise pre-pandemic. Importantly, however, the results of a narrative synthesis (Appendix O) demonstrate that delivering MBIs remotely to parents during the pandemic was broadly feasible and acceptable across different contexts, and furthermore that there were similar barriers to participation identified in all studies. Additionally, and of note to the aims of this thesis, parents included in three of the four studies in the narrative review reported on the loss of connections during the pandemic, and appreciating interventions that fostered connections with other parents more so than self-directed, remote interventions (Maher, 2021; Safer-Lichtenstein, 2022; Wisen-Vincent & Bokoch, 2023).

Project 2 (Chapters 4 and 5) aimed to test the feasibility and acceptability of the *Headspace* app in an uncontrolled study with a small group of self-selecting parents of young children (aged 2-5 years old). Consistent with the few other studies which investigated the effects of MBIs during the beginning of the COVID-19 pandemic in 2020 (see Appendix O), it was found that *Headspace* was both acceptable and feasible for parents, as well as potentially useful. This study also provided an insight into family's experiences during and immediately following the first COVID-19 lockdowns in the UK. It was found that parents reported both increased children's behavioural problems, and simultaneously reported enjoying the slower pace of life the pandemic provided, giving them more quality time with their children (Burgess et al., 2022). This is consistent with other qualitative research which aimed to gain an insight into family life during lockdowns (Neece et al., 2020; Weaver & Swank, 2021). In particular, and of note for the planning of Project 3, parents reported *Headspace* was notably useful for improving their sleep.

Project 3 (Chapter 6) aimed to evaluate *Headspace* more rigorously using an internal pilot RCT design. Previous research utilising self-directed digital MBIs for parents were largely pre-post designs, lacking control groups. This study aimed to build the literature more robustly by randomising participants and including a waitlist control in preparation for a definitive RCT. It also differentiated the content accessed by parents using the app, where one intervention group were instructed to use the sleep content on the app, and the other intervention group were instructed to use only the mindfulness content. This was one of the first RCTs to use *Headspace* with parents, however, recruitment and retention proved challenging and a definitive trial using the same protocol was not deemed to be feasible. Although adherence to the app was better than (Bostock et al., 2019), or comparable to (Champion et al., 2018) other research using *Headspace* in the UK (O'Daffer et al., 2022), less than half the anticipated participants were recruited over a period of 6 months, and 73% of eligible participants who registered interest in the study did not engage with an initial call with the researcher to start participating in the study. Following randomisation, a 38% attrition rate was seen, with 15% (n = 7) lost to follow up, and 23% (n = 11) withdrawing, which is consistent with similar studies investigating *Headspace* (Noone & Hogan, 2016).

Although not intended to detect effects, preliminary tests did demonstrate some promising effects in the hypothesised direction for improvements in parental self-reported sleep disturbances, quality of sleep (g = -1.53 and g = -0.76 respectively), and parent-reported child sleep quality (g = -1.05). Due to the small sample size, the two intervention groups were combined, however, correlations between app use and parent and child outcomes suggested that a stronger relationship may have been present in the mindfulness group than in the sleep group for sleep outcomes, children's externalising problems and parental stress—although, the very small sample sizes when looking at these intervention groups separately (n = 7 in

each) means that no firm conclusions can be drawn. In terms of the primary outcome of interest (children's externalising problems), limited preliminary effects were apparent in this sample. Neither were there any notable effects on parents' wellbeing, or parenting outcomes (parenting styles, co-parent and parent-child relationships). Although not intended to detect effects, the results in this pilot trial in the hypothesised direction for sleep outcomes does suggest some promise for future testing of *Headspace* with parents, and supports the qualitative findings from Project 2, as well as other findings using digital MBIs to improve sleep in general population adults (Economides et al., 2023; Huberty et al., 2021).

7.2 Findings in context

The findings of Project 1 broadly support those of other meta-analyses investigating MBIs in the parenting domain—i.e., that they are more robustly effective at reducing parenting stress than improving children's outcomes, for which there are often variable results (Burgdorf et al., 2019). In terms of Projects 2 and 3 testing the *Headspace* app specifically, a recent review found that *Headspace* improved wellbeing outcomes in 75% of the 14 studies identified (O'Daffer et al., 2022) which is in contrast to the limited effects found in this thesis. However, in the parenting domain specifically, a recent feasibility study by Militello et al. (2022) using a micro-randomised trial design encountered similar issues as reported in this thesis with the implementation of *Headspace*—namely that the majority of interested parents (67% in the micro-randomised controlled trial, and 73% in the pilot RCT in this thesis) were lost during enrolment. As such, it is proposed that protocols which account for the competing demands on parent attention, the need for simplicity in solutions for parents, and the ability to integrate into family routines may be better posed to reduce barriers to participation in this population (Militello et al., 2022). This is of interest particularly

in light of some of the criticisms of secular MBIs such as *Headspace*, which—in the process of breaking down barriers to participation—have been described as watering down mindfulness practice by emphasising an integration with the 'doing' nature of Western societies without holding space for the 'contemplating' nature of mindfulness' Buddhist roots (Shlonsky et al., 2016). As such, some critics have described the secular application of mindfulness (e.g., *Headspace*) as "McMindfulness" due to deviation from its Eastern context (Krägeloh, 2013). This has been argued to inevitably predispose research to erroneous conclusions driven by a fixation on cheap utility over enlightening experiences (Farias & Wikholm, 2016).

The second generation of MBIs which were developed in reaction to this perceived watering down of mindfulness as a function of capitalism in the McMindfulness movement (Purser, 2019), are, however, not widely applied in parenting, and in fact may not address the apparent issues with parental engagement that may be inferred from the difficulties with recruitment and retention in this thesis and the similar work of Militello et al. (2022). For example, second generation MBIs are to some extent more overtly psycho-spiritual or spiritual in nature, and in contrast to first generation MBIs require instructors to have achieved several years of supervised mindfulness practice, as well as in some instances requiring participants to engage in one-to-one discussion sessions with program facilitators (Van Gordon & Shonin, 2020). These aspects designed to more closely align MBIs with Buddhist spiritual roots may in fact serve to reduce accessibility for already overwhelmed parents whose attention and time is difficult to capture (Militello et al., 2022).

However, it remains the case that self-directed MBIs such as *Headspace*, which explicitly position individuals as responsible for constant self-monitoring and amendment to improve their own health and wellbeing (Kołodziejska & Paliński, 2022; Walker & Viaña, 2023) are

directly at odds with the Buddhist ideology that it is not possible to separate the self from its surroundings (i.e., that the individual is an illusion; Oh, 2022). As such, it may be useful to consider *Headspace*, which incorporates a range of content (some unrelated to mindfulness practice, such as the sleep content) as a self-directed means of learning an "attention-based psychological technique" as opposed to practicing mindfulness (Van Gordon et al., 2016). This has important philosophical implications for the use of *Headspace*, how it relates to mindfulness more broadly, and the ways in which parents may be incentivised to practice the skills it teaches. The evidence presented in this thesis suggests that whilst accessibility (including time constraints) were one of the most widely cited barriers to using the app in both Projects 2 and 3 (leading to parents using it at night, or withdrawing from the study), the non-meditative content may not be as useful as the mindfulness-based content (e.g., dose response relationships seen in Chapter 6). This warrants further investigation, but it is posited that parents might not benefit from the more stringent and potentially inaccessible criteria required to be a more philosophically cogent second generation MBI, despite more traditional elements of mindfulness potentially being more impactful for parent outcomes.

Considering the findings discussed above together, three overarching themes are presented which may have important theoretical implications for the effects of mindfulness in parenting, and practical implications for both parents and clinicians hoping to use mindfulness to improve children's adjustment by improving parental wellbeing.

7.3 Themes and implications

7.3.1 Self-directed digital MBIs may be broadly acceptable for parents

The research comprising this thesis intended to build the evidence base at stage II of the NIH behavioural interventions model (Onken et al., 2014)—efficacy in research contexts.

Two of the most important aspects of evidencing interventions in the initial testing phases (both stages I and II of the NIH model) are understanding the feasibility and acceptability of the intervention for the target population (Onken et al., 2014). The results reported in all three projects in this thesis provide evidence for the acceptability of delivering MBIs to parents remotely in a digital format, however, it is important to differentiate the acceptability of the intervention from the acceptability of trial procedures (Perski & Short, 2021). Here, the intervention was demonstrated to be acceptable, although what this means for target populations in practice can differ substantially depending on the context.

As such, it is important to consider the demographic homogeneity of the sample in this thesis—most parents were White, mothers, married or cohabiting with a partner, and in employment or education. Most parents investigated in this thesis were also between the ages of 30 and 45, with a mean age across Projects 2 and 3 of 39 years old (M 42, SD 3.68 in Project 2, and M 37.2, SD 4.12 in Project 3). Although no economic data was collected, and so assumptions about SES are not necessarily reflective of lived realities, the demographic characteristics of the participants in this thesis are most often associated with privilege (i.e., being an ethnic majority, being in employment, and not being a young parent) (Moffitt et al., 2002), and should be considered in light of the already WEIRD (White, Educated, Industrialised, Rich, Democratic) context of the UK (Henrich et al., 2010). This is also reflected in the wider MBI literature, as demonstrated in Project 1, where the majority of the sample (n = 1, 897 parents across 22 studies) were also White (averaging 87.25%), married (averaging 84.72%), with a mean age of 38.5 years (ranging from 30 to 47). These demographic characteristics have implications for both experiences of parenting, and the potential acceptability of engaging with an MBI.

In terms of parenting, so-called 'intensive mothering' which stems from neo-liberal concepts of individuality and risk management, and is largely based on middle-class ideals, is often accepted as the 'proper' way to raise children (Romagnoli & Wall, 2012). Intensive mothering has been described as a physically, emotionally, and economically expensive ideology which centres the needs of the child (not limited to physical but also including emotional, psychological and cognitive) in the family, and which identifies a number of risks (including parents) that children need protecting from (Hays, 1996). It is ostensibly the act of ensuring the best possible outcomes for a child by engaging with developmentally rich and emotionally absorbing childrearing practices (Budds et al., 2017). This attitude to parenting, whilst aiming to provide the best outcomes for children, is often unrealistic for mothers who do not have the requisite social and cultural capital to provide such an intensively enriching experience for their children (e.g., single mothers, uneducated and/or unemployed mothers), making it appear the domain of the middle class. However, middle-class mothers, and in particular those who need the financial capital to facilitate the 'correct' enrichments for their children (e.g., when living in an expensive city like London; Greater London Authority, 2023) are often then left with guilt for spending time away from their children by working, and with little energy to pursue other activities (Budds et al., 2017).

Whilst intensive mothering is not directly related to MBIs for parents, nor explicitly acknowledged in the extant literature, the concept is of note for this thesis because the act of engaging in a self-directed mindfulness intervention to manage stress and hopefully improve child outcomes is very much in-keeping with the basic tenets of an 'intensive mothering' ideology. In practical terms, this may have served to exclude younger, lower-income mothers, and fathers (for whom the ideology is less applicable) from the intervention and has implications for how to broaden its reach. Qualitative research with young, low-

income mothers, for whom state-driven interventions are often aimed at promoting intensive mothering practices to improve child outcomes, has found that such people (often excluded from the ideology) negotiated self-perceptions to re-evaluate the validity of intensive mothering advice; i.e., “I know I’m a good mom” (irrespective of what society may think) (Romagnoli & Wall, 2012). This may be particularly pertinent given the almost entirely employed, relatively ‘older’ mothers included in this sample.

Intensive mothering is also presented as being dominated by affluent White mothers, however, qualitative research with Black mothers, for example, highlights that sacrifice, self-reliance and protection of children are not the domain of affluent White women, but do come at an increased cost of emotional and physical wellbeing for Black and minority ethnic group women (Elliott et al., 2015). A recent latent class analysis of intensive mothering behaviours and attitudes in 306 American mothers of young children (aged 1 to 5) demonstrates some interesting and applicable negotiations of the construct which appear to be impacted by race and class (Lankes, 2022). The latent class model identified four underlying latent classes of intensive mothering: relaxed mothers (33% of the sample—low on intensive mothering), high investor mothers (25%—high intensity behaviours with some non-intensive attitudes), essentialist mothers (22%—traditional attitudes to fathers being secondary parents), and strained mothers (20%—high emotional strain, low intensive behaviours) (Lankes, 2022). Of these four groups, relaxed and essentialist mothers (i.e., those who were less intensive, and those who viewed the mother as essential but the father as secondary) were more likely to be Black, have lower education, lower income, be single mothers and be a younger mother (Lankes, 2022). Whereas mothers with more social advantage, including higher education, income, age, and more likely to be White, were more often predicted class membership of the high investor and strained mother classes (i.e., demonstrated high-intensive behaviours,

or high emotional strain) (Lankes, 2022). This has implications for understanding how to engage a diverse range of parents, including both mothers and fathers from different races, different age ranges, and different SESs in an intervention which is very much in-keeping with intensive mothering ideals, like *Headspace.*

As well as being contextually dependent in practice, acceptability is variously defined and measured in the research literature. Some frameworks arrive at the view that acceptability is best defined and captured by understanding how participants think and feel about a given digital health intervention (Perski & Short, 2021). This is thought to be able to predict user engagement, intervention effectiveness, and likelihood of adoption at local, national and international levels (Perski & Short, 2021). However, each of these elements are influenced by social and cultural norms, as is the underlying concept of acceptability, which should be given particular weight in light of the unprecedented context of COVID-19 that impacted both Projects 2 and 3 in this thesis.

Participants thoughts and feelings about *Headspace* were demonstrably impacted by social restrictions, as evidenced in the qualitative report of parents' experiences using the app presented in Chapter 4. Although often negative in connotation, COVID-19 simultaneously highlighted longstanding issues of inaccessibility, and has propelled research into the potential solutions digital technology can facilitate (Richardson et al., 2021). Participants in the studies synthesised narratively in Appendix O made specific reference to their appreciation of digital connections during otherwise very isolating times, even though these were not necessarily perceived to be as fulfilling as in-person connections (Safer-Lichtenstein, 2022; Wisen-Vincent & Bokoch, 2023). Going forwards, even though the Oxford COVID-19 Government Response Tracker suggests social restrictions ceased in most countries in the

first half of 2022 (Hale et al., 2021), utilising digital tools to facilitate previously in-person interventions may continue to be a notable characteristic of the post-COVID-19 world for clinicians and researchers alike.

However, proliferation of digital tools does not necessarily equate to acceptance of them. The Technology Acceptance model (Davis, 1989) posits that, whilst there are a wide range of theoretical perspectives on what may cause people to accept or reject a technological solution, there is a convergence on the facets of perceived usefulness and perceived ease of use (Davis, 1989). Here, parents qualitatively reported *Headspace* to be both useful and easy to use, although some issues were reported with the latter, which may be a function of the frequently changing user-interface—a potentially important consideration when trying to implement a commercially available app as a wellbeing intervention in clinical practice. These reports should also be interpreted in the light of the homogenous, and arguably demographically privileged samples included here where digital literacy and access to internet-enabled devices is unlikely to have been a problem.

7.3.2 Feasibility issues with self-directed digital MBIs for parents

Feasibility studies may usefully evaluate recruitment capacity, participant characteristics, data collection procedures and measures, as well as preliminary participant responses to the intervention being tested (Arain et al., 2010). In this thesis, both Projects 2 and 3 demonstrated some important implications for the feasibility of a digital, app-based MBI for parents of young children, while Project 1 demonstrated the absence of robust studies investigating digital MBIs for parents in the extant literature. In terms of Projects 2 and 3, which were both significantly impacted by COVID-19 restrictions, data collection and analysis in both studies proved challenging for different reasons. In particular, Project 3 may

have suffered from the inclusion of a call with the researcher to initiate the study, therefore reducing the accessibility of the intervention for parents wanting an entirely self-directed experience. However, if the app is to be implemented in practice by clinicians, it is likely to be recommended to parents following a consultation, and furthermore there are issues with fraudulent research participation in studies conducted entirely without researcher interaction with participants (Pozzar et al., 2020). It may be the case that future research at stage II of the NIH model (NIH, 2023) utilises a less intensive, more remote study protocol, without the need for researcher interaction with participants in order to establish the app's efficacy before moving onto more a more pragmatic, real-world implementation strategy which may include live interactions prior to starting the intervention (reflective of a consultation with a clinician, for example).

Furthermore, despite the increasing reliance on, and acceptance of, digital platforms to facilitate a range of previously in-person gatherings, the sustained feasibility of digital tools in a post-COVID-19 society is understandably not well evidenced. During the pandemic, so-called "Zoom fatigue" (i.e., the increasing cognitive demands of tasks conducted online) began to be more widely reported (Williams, 2021). The MBIs in parenting literature reviewed in Appendix O also seems to suggest that during the pandemic some parents were more keen on in-person meetings to facilitate better quality connections over remote versions of the same session (Maher, 2021; Safer-Lichtenstein, 2022; Wisen-Vincent & Bokoch, 2023).

However, for parents for whom in-person interventions are inaccessible, the data collected and analysed in this thesis does not suggest that self-delivered MBIs themselves are not feasible, but that they may require more thoughtful study design given the difficulties reported here. These findings support more recent work with parents which suggests that

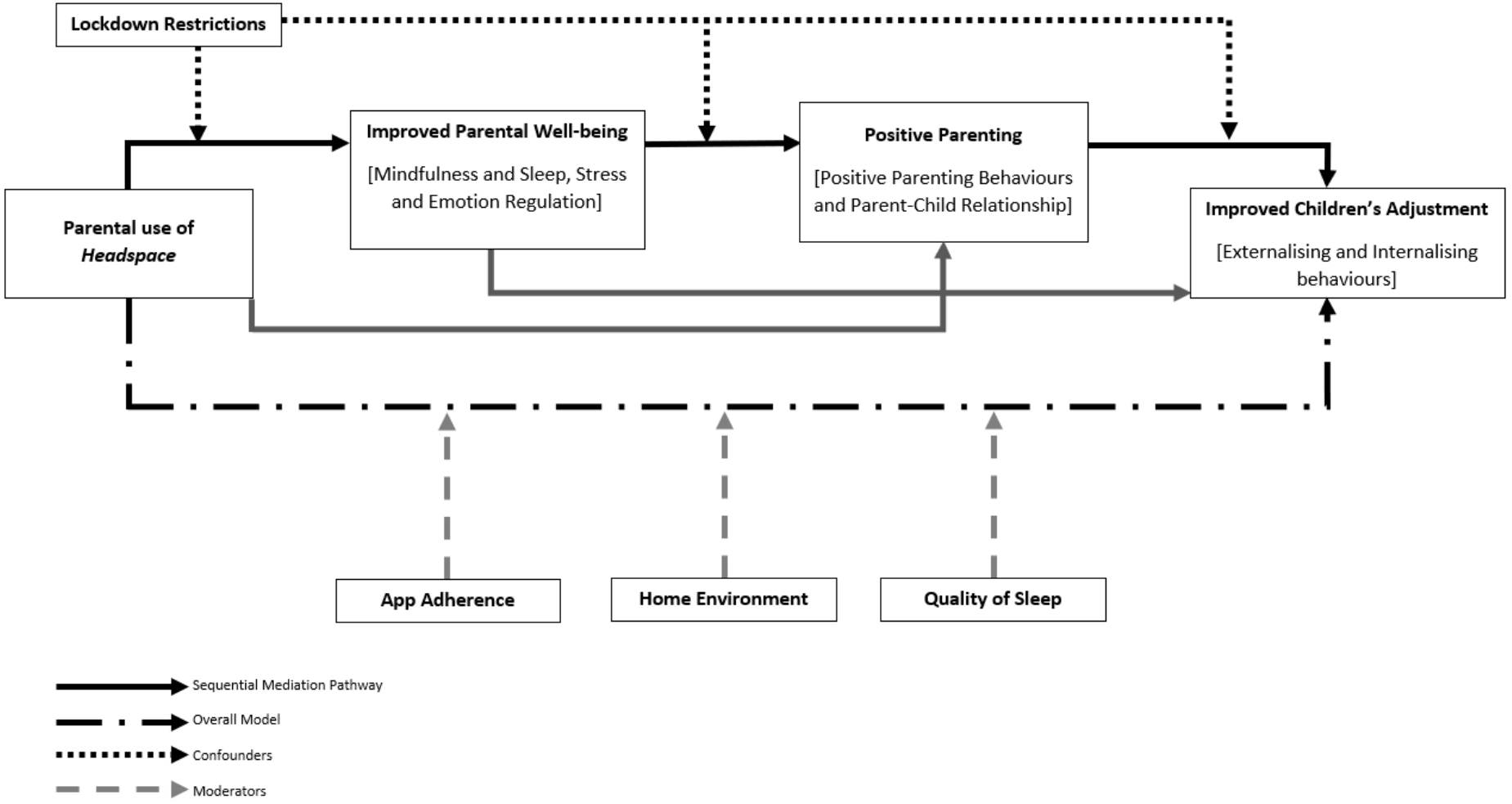
parents are receptive to digital MBIs, and that once recruited, it may be possible to achieve acceptable adherence rates to *Headspace* in small samples (Militello et al., 2022). A generally accepted threshold for adherence rates in healthcare orientated research is 80% (Burnier, 2019), which, promisingly, was demonstrated here in Project 2.

7.3.3 Self-directed digital MBIs for parents may improve child outcomes via more direct improvements in parent wellbeing

Together, the research in this thesis showed moderate effects (g = -0.36) for reducing parental stress in the extant literature, and when accessing *Headspace* for up to 30 days, moderate to large preliminary effects for increases in parental mindfulness (g = .82, 95% CI .10, 1.51), reductions in stress (g = -.72, 95% CI -1.40, -.03), improvements in anxiety and depression (g = -.66, 95% CI -1.31, .02 and g = -.61, 95% CI -1.25, .06, respectively), and cognitive reappraisal as an emotion regulation strategy (g = .63, 95% CI -.04, 1.28), in Project 2. As well as reductions in parental sleep disturbances (g = -1.53, 95% CI -2.34, -0.72), improvements in self-reported quality of parental sleep (g = -0.76, 96% CI -1.46, -0.03) and parent-reported child sleep (g = -1.05, $p < .001$, 95% CI -1.72, -0.38), in Project 3. Consistent with the model of mindful parenting proposed by Duncan et al. (2009), and highlighted in the theoretical model tested in this thesis as displayed in Figure 7.1, these preliminary results could indicate that improving parental mindfulness may have resulted in sequential improvements in parental wellbeing (including stress and sleep). However, the research in this thesis found limited effects for children's outcomes, and more broadly given the serious threats to internal and external validity due to data collection and analysis issues, no evidence to support the overarching model proposed here was found.

Figure 7.1

Headspace for parents' theoretical model and links



The lack of effects seen in children's outcomes across both studies, as well as the inconsistent results for children's outcomes found in the literature review and meta-analysis in Project 1 may point to delayed improvements in children's wellbeing. However, this may also suggest the null hypothesis is appropriate, i.e., it may be the case that the hypothesised model is not supported by the data, and should be revisited. However, if improvements in parental wellbeing are slow to improve parenting practices in the short term, resultant changes in children's behaviour may not be readily apparent. Future research may benefit from addressing methodological issues in order to gain a clearer understanding of the impact of the intervention without the confounding of small and homogenous samples, before moving onto more longitudinal studies to test causal pathways between mindfulness, parent wellbeing, and child outcomes.

One aspect of the preliminary effects of mindfulness that may be of particular interest to the aims of this thesis was the difference in dose-response relationships seen in Project 3 between the mindfulness and sleep groups. Although sample sizes in each group were very small, some differences were apparent between the two active intervention groups and change scores for children's externalising problems, as measured using the ECBI (Eyberg & Pincus, 1999). Specifically, a large relationship between externalising problems was noted in the mindfulness group (r = 0.62), where a much smaller relationship was seen in the sleep only group (r = 0.08). This may suggest that although parents qualitatively reported *Headspace* to be most beneficial for their sleep, which reportedly allowed them to be more understanding of their children's behaviours, the positive effects they attributed to better sleep may actually have been the result of mindfulness practice more directly. However, it is important to be cautious about these effects due to the small sample size and any interpretation should be considered speculative, not inferential.

It is also important to note that the results from both Projects 2 and 3 suggesting improvements in parents sleep following using the *Headspace* app are difficult to contextualise in the extant literature due to the lack of research investigating interventions designed to improve this aspect of parental wellbeing. Despite the relative lack of literature investigating links between parental sleep and quality of parenting, there are well-established links more broadly between sleep dysregulation and a range of problems in daily functioning, including increased symptoms of depression, poor emotion regulation and increasing frequency of marital disagreements (Bai et al., 2020).

There is, however, a growing body of literature investigating the link between mindfulness and sleep in more general populations, which this thesis adds to for parents. For example, a recent meta-analysis of RCTs including 1, 654 participants demonstrated moderate effects (g = 0.33, 95% CI 0.17, 0.48) of MBIs for improving sleep quality when compared to nonspecific active controls (a finding that was maintained at follow up—g = 0.54, 96% CI 0.24, 0.84) (Rusch et al., 2019). This is promising, and arguably unsurprising given the most widely accepted model of sleep disturbance—the hyperarousal hypothesis—states that psychological and physiological hyperarousal results from counterproductive efforts to 'make sleep happen' (Harvey et al., 2005; Ong & Moore, 2020). This outcome-orientated approach is in opposition to mindfulness which is intended to assist individuals to shift their perspective to a more accepting, process-orientated state of observation (i.e., observing that sleep is disturbed, rather than actively trying to reduce sleep disturbance, thereby calming arousal with acceptance, not exacerbating it) (Ong & Moore, 2020).

This proposal for the utility of MBIs for sleep is arguably supported by the findings in this thesis, particularly in Chapter 6 whereby greater relationships were seen between use of

the app and study outcomes in the mindfulness group—where parents were specifically subject to the skills which can change their perspective from outcome to process-orientated—than those in the sleep group—where parents were subject only to relaxing (but not explicitly mindfulness) content. However, again, feasibility issues resulting in very small numbers of participants in each group prohibit firm conclusions and inferences from the data presented.

7.4 Strengths

7.4.1 Novelty

A prominent strength of this thesis is the novelty of the research. Prior to the start of this thesis, no published evidenced was found testing a smartphone app to deliver a self-directed MBI to parents. The novelty of this work became perhaps even more prescient as a result of the onset of COVID-19 restrictions shortly after starting. Prior to the pandemic, the research was considered important as a means of improving accessibility to wellbeing interventions for parents unable to access traditional support—often encompassing more vulnerable and disadvantaged families (Department for Communities and Local Government, 2012; Gardner & Leijten, 2017; Koerting et al., 2013). During and after the pandemic, it became evident that parents who previously would not have been classified as at risk of mental health problems were struggling to cope and unable to access support (Children's Commissioner, 2022; OECD, 2021b). This arguably broadened the scope, and increased the relevance, of testing a self-directed digital MBI for parents.

7.4.2 Mixed methods

The integration of extant literature syntheses (quantitatively in Chapter 3, and qualitatively in Appendix O) in combination with the use of both qualitative and quantitative

data collection strategies (in Chapters 4, 6 and 7), allowed for a more holistic understanding of the potential effects of self-directed digital MBIs for parents, as well as the feasibility and acceptability of a specific mindfulness-based app (*Headspace*), in what was an unforeseeably turbulent time, with what became an unintentionally small sample for the thesis. The use of mixed methods proved particularly useful during Project 2 where the quantitative data collection may not have accurately reflected the experiences of parents using the app due to the confounding effects of lockdown restrictions. More broadly, mixed methods research is argued to provide researchers with a more complete methodological approach to answer a range of research questions pertinent to intervention development and testing (Molina-Azorin & Fetters, 2019), especially for novel interventions in the early stages of testing, as here. The inclusion of qualitative data collected from parents about their own experiences of the app is also important in the creation of knowledge that aims to generate user-led solutions, as well as proliferate further questions for future research to address (Romaioli, 2022).

7.4.3 Adherence to the app

Adherence to the app in both Projects 2 and 3 was comparable to, or better than, most studies utilising *Headspace* as a self-directed intervention (Liptáková et al., 2022). This may have been as a result of the small sample sizes, and the relationships built between the researcher and participants which allowed for closer monitoring, and which may have had influences on participant behaviours during the studies. It may also be a feature of the collaborative nature of the research, incorporating the option to have frequent access to app usage data when required to guide data collection strategies. The utility of industry collaboration may be particularly evident, in combination with the strengths of a mixed

methods approach, where objective app usage data in conjunction with qualitative parent reports from Project 2 were used to plan the study protocol for Project 3, and in subsequently being able to analyse different usage patterns and dose-response relationships in Project 3.

7.5 Limitations

7.5.1 Sample size

The data collection and analysis for both the feasibility and pilot RCT studies in this thesis were affected by the COVID-19 pandemic, albeit in different ways, to produce a much smaller sample of parents than intended for this thesis. In Project 3 particularly, the feasibility of the protocol incorporating a telephone call, and three separate trial arms, may have been overly ambitious for the resources of the researcher as well as the participants. Although neither Projects 2 or 3 were intended to provide definitive inferential statistics, the small sample size of Project 3 limited the analysis that could be conducted on the data as the internal pilot trial was not determined to be feasible and thus there was no scope to progress to a definitive trial for which inferential analysis was planned. The data analysis presented in Project 3 and briefly discussed above is therefore unreliable and underpowered beyond the scope of this thesis, and is of less significance than the feasibility and app adherence data simultaneously presented. Of particular concern for the data analysis in both Projects 2 and 3 is that p-values cannot be relied on particularly when using small samples, and therefore, the effect sizes with corresponding 95% CIs also presented should be prioritised when interpreting the findings (Sullivan & Feinn, 2012).

Furthermore, unfortunately, one of the main strengths of stage II of behavioural intervention research as described in the NIH model presented in Chapter 1 (NIH, 2023), is the use of randomised designs and intervention control that support causal inference (Onken

et al., 2014). That has not been possible to achieve in this thesis due to feasibility issues with the pilot RCT design and therefore, the evidence presented could be argued to remain at stage I of the model—feasibility and pilot testing (Dimidjian & Segal, 2015).

7.5.2 Sample characteristics

As well as being limited by data collection issues, the recruitment for both Projects 2 and 3 produced a much more homogenous sample of parents than intended. In Project 2, data collection may have been hampered by a reliance on personal and professional networks, and in addition to this in Project 3, the relatively intensive nature of the protocol may have inadvertently filtered out parents without the requisite social and cultural capital to prioritise participating in this kind of research. Although neither study was intended to provide definitive inferential statistics, the homogenous demographic characteristics of the samples (mostly White, mothers, married or cohabiting with a partner, in education or employment), limits the generalisability of the descriptive findings beyond this thesis.

It is also important to note that recruitment for both studies was London-centric, where the population differs slightly to the rest of the UK and further limits the generalisability of the findings. According to the 2021 Census 36.8% of London residents identified as White (ONS, 2022d), in comparison to the rest of the UK, where 82% of the population is White. Unemployment is low in London (5.6% in 2021; ONS, 2022e) which is reflected in this sample, and in the rest of UK (3.8%; ONS, 2023b), however, London contains the highest rate of lone parent families in the UK (26.8%; ONS, 2022f) which is not reflected in this thesis.

7.5.3 COVID-19

Whilst the qualitative data collected in Project 2 provided a valuable insight into family life during the initial phases of COVID-19 in 2020, it remains the case that this significant, unprecedented, and unpredictable factor had a major impact on the research conducted in this thesis. Although efforts have been made throughout to contextualise the results, according to which government restrictions were in place during which phase of each study, there are undoubtedly manifold effects of the pandemic that have either not been accounted for here, or conversely that have been erroneously attributed to it.

7.6 Future research

Whilst limited by data collection issues and homogeneity in the samples, as well as the unfortunate COVID-19 related impacts on study timing and data analysis, this thesis does highlight some interesting avenues for future research. In particular, the work suggests that it may be prudent to prioritise qualitative research with parents of young children to determine if *Headspace* and other such self-directed digital MBIs are relevant for their needs before attempting to deliver it as an intervention. The difficulties with recruitment and retention found here in the pilot trial were mirrored in some of the feasibility issues reported in the qualitative interviews in Project 2, as well as in similar work by Militello et al. (2022), and, while likely affected by COVID-19, are unlikely to be only due to this extraordinary event. Crucially, there are relatively few reports of patient and public involvement (PPI) work in the mindfulness in parenting intervention development literature. Not only can PPI help to ensure interventions are relevant and appropriate for the intended audience, but it has also been demonstrated to increase success in recruitment attempts (Crocker et al., 2018) and is useful in shaping future study designs (Wykes, 2014). The lack of PPI in the mindfulness in parenting

literature – and its potential utility – is perhaps most usefully illuminated in the "failed" trial by Hartley et al. (2022), whereby it was only after recruitment efforts failed that semi-structured interviews were conducted to find out what the barriers and facilitators to participation were. As public involvement in research is increasingly an expected norm in the UK (Russell et al., 2020), and the field of mindfulness may still be said to be running with intervention testing before it has walked with theory testing (Cowling & Van Gordon, 2021), qualitative work with parents about mindfulness might be particularly beneficial for determining research priorities before testing new avenues of intervention.

In terms of the theory behind mindfulness in parenting, the mixed findings regarding children's outcomes from the meta-analysis in Project 1, and the limited findings for children's outcomes in the feasibility study and pilot trial in Projects 2 and 3, suggest it may be prudent to prioritise the rigorous investigation of the mindfulness in parenting model as applied to self-directed interventions. In part, there is a need to augment the clarity and robustness of concept definitions in ways that allow for more rigorous basic and intervention research (see Section 1.5.1). For example, by more clearly explicating what secular mindfulness is, and how it differs from Buddhist mindfulness, whilst arguably decontextualizing the intervention, may allow for more positivist operationalisations of mindfulness (i.e., how it works from within a framework of Western science; Grossman & Van Dam, 2011). There may also be utility in identifying more clearly what is meant by children's outcomes, and for whom those outcomes are important, as interventions intended to be a cure-all for all children's problems are unlikely to be specific enough to be usefully measured, particularly across diverse developmental stages (Butterfield et al., 2020). Additionally, due to language constraints and primarily adult-derived frameworks, the validity of children's outcome measures commonly used in the mindfulness literature has been raised as an important limitation to research

intending to test interventions designed to improve children's wellbeing which do not centre the child themselves (Fattore et al., 2019).

Incorporating the end user of the intervention (parents) for further qualitative work involving focus groups as well as semi-structured interviews is warranted. A broader range of research designs testing the model, not only in intervention contexts, will also help to better understand feasibility issues with trials of self-directed digital MBIs and thus may contribute to the development of more flexible, parent-orientated study protocols which improve adherence and reduce attrition. In addition to diversifying designs and incorporating model testing outside of intervention contexts, with a more user-centred approach, there may be a greater chance of feasibly executing more robust longitudinal designs with larger, and more diverse samples to provide more causal support for, or more robustly reject, the proposed path model between improving a parent's mindfulness, and improving their child's outcomes.

In terms of the findings from Projects 2 and 3 which may warrant replication attempts in the future—the under-researched link between practising mindfulness and improving parent perceptions of sleep would be of interest. In particular, studies which are able to robustly analyse the effects of the different kinds of content available on the *Headspace* app (as was intended in Project 3) would be particularly illuminating. I.e., does practising mindfulness itself improve sleep, or would any sleep aid available on the *Headspace* app (mindfulness-based or not) improve perceptions of sleep to the same extent. Again, larger and more diverse samples, incorporated in a longitudinal design would be of greatest value.

7.7 Practice implications

The findings in this thesis do, however, suggest that for the kinds of parents included in this thesis (i.e., relatively demographically privileged), using *Headspace* may be an acceptable

and useful addition to daily routines. For parents interested in incorporating elements of mindfulness into their daily life, parents in this thesis recommended using *Headspace* at night and not feeling pressured to use the app every day to feasibly incorporate it in their lives. For clinicians, parents in this thesis reported finding regular contact with the researcher to be reassuring, where a self-directed app could otherwise feel a little directionless—in particular for the Basics packages which are not explicitly orientated as an MBI for parents.

In terms of MBIs more broadly, the findings in this thesis suggest that improving parent mindfulness can reduce parental stress, which irrespective of future implications for children's wellbeing is a worthwhile goal. As reported in Chapter 3, these findings are more robust for in-person interventions, delivered by a trained facilitator, as opposed to self-directed digital interventions, and the qualitative results presented in Appendix O suggest that some parents might prefer in-person sessions as a means of gaining a support network during the intervention (i.e., talking to other parents). When working with parents who may benefit from stress reduction, clinicians may usefully recommend MBIs as a safe and potentially effective intervention.

7.8 Conclusion

The research presented in this thesis contributes to the scientific knowledge and understanding of the feasibility, acceptability, and preliminary effects of giving parents access to a self-directed digital MBI via a commercially available smartphone app to improve both parent and child wellbeing outcomes. In particular, it makes a significant contribution to the research in three respects, the first being the robust synthesis of previous RCT literature demonstrating moderate effects of MBIs on parenting stress that were robust to sensitivity analysis (g = -0.36), and promising (if small) effects on children's outcomes (g = -0.15). The

second contribution is that this thesis presents one of the first attempts to test a self-directed digital mindfulness-based smartphone app in a parent population, and the third is the use of both quantitative and qualitative literature syntheses as well as both a mixed methods single-group study design and a pilot RCT design to gain a methodologically diverse understanding of the experiences of parents and the potential feasibility, acceptability, and preliminary direction of effects of self-directed digital MBIs in this population. In terms of feasibility and acceptability, this thesis demonstrated that whilst *Headspace* may be an acceptable intervention for parents, careful consideration is warranted to improve the feasibility of trial designs. In terms of preliminary effects, this thesis also highlights a potential relationship between sleep and mindfulness that has previously been under-researched in the parenting context (Brewer et al., 2020). The findings reported here support the continued testing of *Headspace* in this population, as it has been found to be an acceptable and feasible intervention for parents, although care is warranted to ensure feasibility of study designs, particularly post COVID-19.

Despite issues of reliability and generalisability, the findings in Chapters 3 to 7 suggest that mindfulness may be a key driver of improved outcomes for both children and parents. In particular, an under-researched aspect of parental wellbeing, sleep, was identified as potentially being more improved by mindfulness practice when compared with access to sleep specific content only. The issues with recruitment and retention during the pilot trial, as well as the learning from the mixed methods case study which was applied during the planning stages, may be usefully applied in future to design a more feasible and robust study to investigate the effects of *Headspace* in a more reliable dataset, collected during a more socio-culturally stable time, from a more diverse population. As one of the first of its kind, this research aims to serve as a springboard for future work examining the effects of a self-

directed, commercially available MBI for parents. Importantly, the current work requires replication in more rigorous studies before extending into real-world efficacy testing, but new avenues of interest have been identified here for this novel field of study.

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Appendix A

Project 2: Recruitment Poster

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Are you the parent of a child aged 2 to 5?

Young children can be noisy, energetic, bored, or just a bit of a handful. And sometimes, being a parent can be difficult.

Sound familiar? This study might be for you!

Our research aims to find out whether using an **app** called **Headspace** can help parents like you.

You will be asked to use the app for **10 minutes a day** for **30 days**. Before and after you do this, we'll ask you questions about your stress levels, how you feel about parenting, and your children's behaviour.

You'll get **free access to the app** for the duration of the study, and if you finish the study, you'll receive a **£15 voucher** for your time.

Interested? Please click the link below (or copy and paste to your browser) to register!

https://goldpsych.eu.qualtrics.com/jfe/form/SV_bvGS9XJJyDZSIX7

If you have any questions, please do get in touch. We'd love to hear from you!
Email:

Unfortunately, if you have twins, or if you or your 2-5-year-old child has a neurodevelopmental or mental health disorder, we can't include you in our study at this time.

Appendix B

Project 2: Introductory Email Template

Hi [insert name],

Thanks so much for registering your interest for our study! Please find attached the participant information sheet for you to read through.

Taking part in this study will involve using the *Headspace* app to meditate for up to 10 minutes daily for one month. By taking part, you'll get access to the app for free for the duration of the study, as well as a voucher worth £15 if you complete the final interview.

I'll ask you to fill in a survey which will take approximately 15 minutes on three separate occasions; before you start using the app, after you've finished using it for the month, and then 2 weeks later. I'll also ask that we arrange a phone or Skype call to briefly talk about you and your child, both before and after you've used the app.

If you're interested in taking part, let me know when will be convenient to arrange a 20-minute voice/video call. Also, below, please find the link to the survey which you can do before we chat.

https://goldpsych.eu.qualtrics.com/jfe/form/SV_6nDvrs7mHdyA7Yx

In the meantime, feel free to drop me an email or voicemail with any questions, my phone number is in my signature.

Best wishes,

Abi

Appendix C

Project 2: Participant Information Sheet and Consent Form

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Participant Information Sheet

Headspace for Parents –

Using a mindfulness app to manage parenting stress

If you have any questions at all, please do not hesitate to contact us!

Email:

You are being invited to take part in a study about mindfulness in parenting at Goldsmiths, University of London. This study is being conducted as part of PhD studies in collaboration with the *Headspace* company. Before you decide whether or not you want to take part, it is important to understand why this research is being done. Please take the time to read the following information carefully.

Principal Researcher: Abigail Burgess, Psychology Department,

Supervisor:

What is the purpose of the study?

Parenting styles driven by parental stress can have adverse impacts on children's wellbeing. Mindfulness has been demonstrated to reduce stress in a variety of different contexts, but there is not much research using it with parents.

The aim of this study is to test the acceptability and feasibility for parents of using *Headspace*, a mindfulness smartphone app. The app is designed to support people in practicing daily mindfulness to help them cope with stress. We are interested in the potential for this to help with parenting and

children's wellbeing. The study will last for approximately 7 weeks, during which time you will be asked to participate in a telephone interview, complete an anonymous online survey, and do between 3 and 10 minutes of *Headspace*-guided mindfulness meditation per day for 30 days.

Why have I been invited to take part?

Parents of children aged 2-5 years old who are normally resident in the UK and have no previous experience of using *Headspace* are invited to take part. We are looking for 12 people to take part in this study.

Do I have to take part?

No! In our experience families find taking part in our research interesting, but it is entirely up to you to decide whether or not to do so. If you decide you would like to take part, we ask you to give your formal consent, but even then you can opt out or withdraw from the study at any time during data collection without giving any reason and without any consequences.

What will happen if I take part and what are the benefits?

1. You will be asked to fill in an anonymous online questionnaire (approximately 15 minutes long).

You will then be asked to provide a 5-minute speech sample about your child over the phone. This will be audio-recorded.

You will then be given free access to the *Headspace* app and asked to complete a series of meditation packs, requiring no more than 10 minutes of mindfulness meditation per day for 30 days.

2. Immediately after finishing the 30 days of meditation, you will be asked to fill in the same anonymous online questionnaire you completed at the start (approximately 15 minutes). You will also be asked to provide another 5-minute speech sample about your child, which will be audio-recorded.
3. Two weeks after this, you will be asked to fill in the same anonymous online questionnaire for the last time. We will then invite you to participate in a telephone interview, where you can then talk about how you found the experience of using *Headspace* in your daily life. This interview will also be audio-recorded, and is anticipated to last between 30-45 minutes.

The 5-minute speech samples will be coded, and the interview will be transcribed and anonymised. After anonymous transcripts have been created, the audio recordings will be destroyed, and you can choose to be sent the transcript to review before it is used.

We hope that this research will help us understand and reduce the effects of stress for parents and their children. We also hope might be able to improve access to preventative interventions for families who have fewer resources to utilise mindfulness interventions in-person.

What are the possible disadvantages and risks of taking part?

We do not foresee any significant disadvantages to your taking part. However, some people do not like doing mindfulness and or answering questions about their family. Again, you are free to withdraw at any time if you find this to be the case.

Will what I say in this study be kept confidential?

Yes. Your data will be fully anonymised using ID numbers, no identifying information will be linked to data collected, and you will not be identifiable in any reports or publications. Identifiable data will be accessed by authorised persons in the research team for research purposes only. All data will be stored securely, in full compliance with data protection legislation.

Data from the whole study will be collated into an anonymised dataset, from which no individual can be identified. This anonymised dataset will be made available to future researchers in a central data repository - the UK Data Archive. The UK Data Archive is based at the University of Essex and is funded by the Economic and Social Research Council (ESRC). This ESRC funded PhD project requires anonymised data to be open and accessible to improve the quality of this and future research.

Are there any limits to confidentiality?

Confidentiality will always be respected, subject to legal constraints and professional guidelines. Please note that assurances on confidentiality will be strictly adhered to unless there is evidence of wrongdoing or potential harm to you or your children. In such cases, Goldsmiths, University of London may be obliged to contact relevant statutory bodies or agencies, with your knowledge.

What will happen to the results of the research study?

Without any identifying information, results of this study will be used in a thesis submitted as part of the PhD project, and published in academic and layperson talks and publications. You can request access to these by contacting the Researcher.

Who is organising and funding the research?

The department of psychology at Goldsmiths, University of London, in collaboration with *Headspace*. Part of PhD studies funded by the South East Network for Social Sciences (SeNSS), ESRC, this study has been approved by the Psychology Department's Ethics Committee at Goldsmiths, University of London.

What if something goes wrong?

If you have any concerns about your participation or about the study in general, you should first contact Abigail Burgess or her supervisor, [ ] listed above.

If you feel your complaint has not been satisfactorily handled, you can contact the Chair of the Goldsmiths Research Ethics and Integrity Sub-Committee via Research Services on [ ]
[ ]

Thank you for reading this information sheet and for considering whether to take part.

Data Protection Privacy Notice

The General Data Protection Regulation [GDPR] and Goldsmiths Research: guidelines for participants

Please note that this document does not constitute, and should not be construed as, legal advice. These guidelines are designed to help participants understand their rights under GDPR which came into force on 25 May 2018.

Your rights as a participant (data subject) in this study

The updated data protection regulation is a series of conditions designed to protect an individual's personal data. Not all data collected for research is personal data.

Personal data is data such that a living individual can be identified; collection of personal data is sometimes essential in conducting research and GDPR sets out that data subjects should be treated in a lawful and fair manner and that information about the data processing should be explained clearly and transparently. Some data we might ask to collect falls under the heading of **special categories data**. This type of information includes data about an individual's race; ethnic origin; politics; religion; trade union membership; genetics; biometrics (where used for ID purposes); health; sex life; or sexual orientation. This data requires particular care.

Under GDPR you have the following rights over your personal data[1]:

- ***The right to be informed***. You must be informed if your personal data is being used.
- ***The right of access***. You can ask for a copy of your data by making a 'subject access request'.
- ***The right to rectification.*** You can ask for your data held to be corrected.
- ***The right to erasure***. You can ask for your data to be deleted.
- ***The right to restrict processing***. You can limit the way an organisation uses your personal data if you are concerned about the accuracy of the data or how it is being used.
- ***The right to data portability***. You have the right to get your personal data from an organisation in a way that is accessible and machine-readable. You also have the right to ask an organisation to transfer your data to another organisation.
- ***The right to object***. You have the right to object to the use of your personal data in some circumstances. You have an absolute right to object to an organisation using your data for direct marketing.
- ***How your data is processed using automated decision making and profiling***. You have the right not to be subject to a decision that is based solely on automated processing if the decision affects your legal rights or other equally important matters; to understand the reasons behind decisions made about you by automated processing and the possible consequences of the decisions, and to object to profiling in certain situations, including for direct marketing purposes.

Please note that these rights are not absolute and only apply in certain circumstances. You should also be informed how long your data will be retained and who it might be shared with.

How does Goldsmiths treat my contribution to this study?

Your participation in this research is very valuable and any personal data you provide will be treated in confidence using the best technical means available to us. The university's legal basis for processing your

[1] https://ico.org.uk/your-data-matters/

data[2] as part of our research findings is a "task carried out in the public interest". This means that our research is designed to improve the health, happiness and well-being of society and to help us better understand the world we live in. It is not going to be used for marketing or commercial purposes.

In addition to our legal basis under Article 6 (as described above), for **special categories data** as defined under Article 9 of GDPR, our condition for processing is that it is "necessary for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes".[3]

If your data contributes to data from a group then your ability to remove data may be limited as the study progresses, when removal of your data may cause damage to the dataset.

You should also know that you may contact any of the following people if you are unhappy about the way your data or your participation in this study are being treated:

- Goldsmiths Data Protection Officer – [ ] (concerning your rights to control personal data).
- Chair, Goldsmiths Research Ethics and Integrity Sub-Committee - via [ ] REISC Secretary (for any other element of the study).
- You also have the right to lodge a complaint with the Information Commissioner's Office at https://ico.org.uk/make-a-complaint/

[2] GDPR Article 6; the six lawful bases for processing data are explained here: https://ico.org.uk/for-organisations/guide-to-the- general-data-protection-regulation-gdpr/lawful-basis-for-processing/

[3] Article 9 of the GDPR requires this type of data to be treated with great care because of the more significant risks to a person's fundamental rights and freedoms that mishandling might cause, eg, by putting them at risk of unlawful discrimination.

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Informed Consent Form - Headspace for Parents

Thank you for completing this form. Without this evidence of your consent, we cannot include you in our study!

Please tick the appropriate boxes

Taking part in the study

1. I confirm that I am over 18 years old.

- ◯ Yes
- ◯ No

2. I have read and understood the Headspace for Parents study information, or it has been read to me. I have been able to ask questions about the study and these have been answered to my satisfaction.

- ◯ Yes
- ◯ No

3. I confirm that neither myself nor the child(ren) to be involved in the study have a known or suspected learning disability, (neuro)developmental or mental-health disorder.

- ◯ Yes
- ◯ No

4. I consent to participate in this study voluntarily. I understand that I can opt out of some of the questions and can withdraw from the study at any time during the data collection, without having to give a reason. I understand that, if I decide to withdraw, anonymised data can no longer be removed on completion of the second phase of data collection.

5. I understand that taking part in the study involves three data-collection phases comprising online questionnaires and audio-recorded telephone calls (that will later be coded and transcribed). I understand taking part will also involve using a smartphone app to practice mindfulness.

- ◯ Yes
- ◯ No

Use of information in the study

6. I understand that information I provide may be used for academic and layperson talks and publications.

- ◯ Yes
- ◯ No

7. I understand that personal information collected about me that can identify me, such as my name or where I live, will not be shared beyond the study team.

- ◯ Yes
- ◯ No

8. I give permission for the anonymised data I provide to be deposited in the UK Data Archive, based at the University of Essex and funded by the Economic and Social Research Council, so that it can be used for future research and learning. Future access will be safeguarded by the UK Data Service, for research purposes only.

- ◯ Yes
- ◯ No

Your answer to the next question does not affect your participation in the study in any way

9. I agree that I can be quoted in research outputs (without any of my identifying information).

- ◯ Yes
- ◯ No

Appendix D

Project 2: App Access Instructions for Participants

Hi [insert name],

Lovely to speak just now. Your code to use the app is [insert code].

If you haven't already got the app on your phone, you should be able to find it by searching for "Headspace" in any app store.

Once you've downloaded the app you're ready to go, and you can head to this website: https://www.headspace.com/code to redeem the code.

After you've got your access set up, I'd like you to complete the following 3 packages: Basics, Basics 2, and Basics 3. Each package lasts 10 days. If you can't find the Basics package on the app's homepage, navigate to the "explore" section (for full instructions, see the attached pdf).

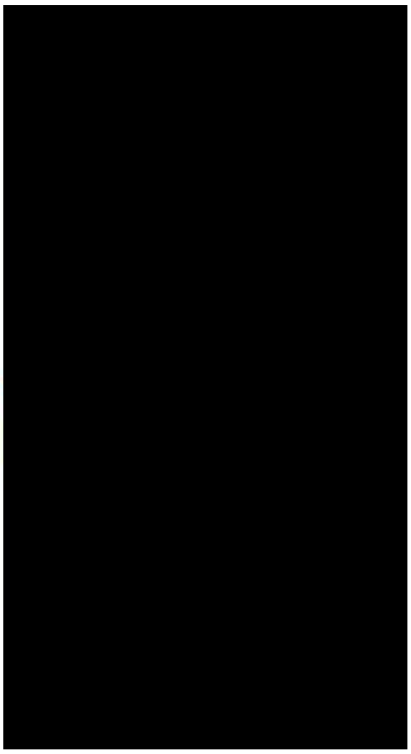
If you have any questions, feel free to drop me a line. And look forward to speaking again soon!

Best wishes,

Abi

Headspace for Parents – The Basics

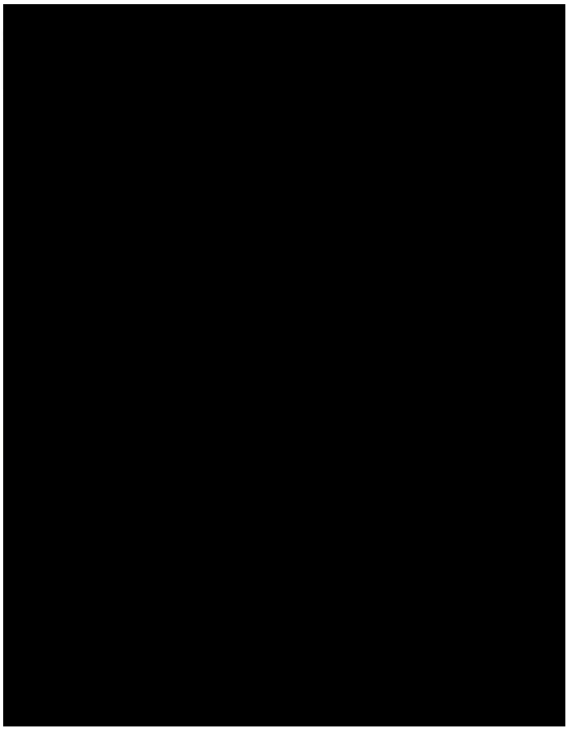
1. Navigate to the "Explore" section, at the bottom of the screen:



2. Select "Beginning meditation"

3. On the Beginning meditation page, scroll down to the section called "start here".

4. If you select "Show all (4)", you will find all the basics packages, shown below:



Appendix E

Project 2: Semi-structured Interview Topic Guide – Feasibility and acceptability of integrating *Headspace* into daily life

Introduction; reminder of procedure (including consent for audio recording); ask participant if they have any questions

1. How did you find using the *Headspace* app?

    How feasible was it to use on a daily basis?

    What barriers did you face to completing the sessions daily?

    What facilitated you to complete the sessions?

2. How did you find doing the Basics?

    What was helpful about it?

    What was difficult about it?

    What would have made it easier for you to do?

3. What was your experience of learning and practicing mindfulness skills?

    What was positive about incorporating mindfulness practice into daily life?

    Where there any negative aspects to incorporating mindfulness practice into daily life?

    Was there a specific time/place you found it easier to do mindfulness at/in?

    Did you explore the app? If so, was there a specific pack you found most helpful? Why?

4. Do you think that doing Mindfulness could benefit other parents of young children?

    Why?

    In what way?

    If not, why not?

5. Do you think that using a smartphone app to deliver mindfulness sessions is helpful?

   Why?

   In what way?

   If not, why not?

6. Do you have any other advice for us about how we can improve parents' experience of using the *Headspace* app?

7. Do you have any other advice for us about how we can improve parents' experience of participating in this study in general?

Closing; thank participant, reminder of next steps for this project (analysis and write up) and plans for the next project (Internal Pilot RCT), ask again if participant has any questions or concerns.

Appendix F

Burgess, A., Cavanagh, K., Strauss, C., & Oliver, B. R. (2022). Headspace for parents: qualitative report investigating the use of a mindfulness-based app for managing parents' stress during COVID-19. *BJPsych Open*, 8(1), e15.

BJPsych Open (2022)
8, e15, 1–8. doi: 10.1192/bjo.2021.1070

CrossMark

Headspace for parents: qualitative report investigating the use of a mindfulness-based app for managing parents' stress during COVID-19

Abigail Burgess, Kate Cavanagh, Clara Strauss and Bonamy R. Oliver

Background

Stress can compromise parental well-being and may contribute to harsh and critical parenting styles, which are in turn associated with children's conduct problems. Coronavirus disease 2019 (COVID-19)-related restrictions are likely to have exacerbated parental stress as, for many, UK-based family life was altered considerably. Mindfulness has been demonstrated to improve stress management and emotion regulation when delivered to parents in person, however, more accessible online interventions are under-researched.

Aims

To provide preliminary data on family well-being and parent–child relationships as well as the acceptability and usability of the Headspace app – a self-delivered mindfulness-based intervention – for parents in low-risk families during the early days of the COVID-19 pandemic.

Method

We provided 12 parents with access to Headspace, and collected qualitative data (semi-structured interviews and 5 minute speech samples) immediately following the initial COVID-19 lockdown in the UK. The resulting transcripts were thematically analysed.

Results

Most parents reported Headspace to be acceptable and useful – improvements in parents' own sleep were particularly noted – and there was high adherence to the intervention. However, difficulties related to family well-being and parent–child relationships following the lockdown were also reported.

Conclusions

As a result of the confounding impact of COVID-19 restrictions, and varied access to app content, we were unable to determine any outcomes to be a result of practising mindfulness specifically. However, COVID-19 has had a profound impact on many UK-based families, including those previously at low risk, and our results demonstrate that Headspace may have beneficial effects for parents. There is a need to more rigorously test this tool with a broader range of families.

Keywords

Adjustment disorders; childhood experience; conduct disorders; psychosocial interventions; qualitative research.

Background

Worldwide, Coronavirus disease 2019 (COVID-19) and associated lockdown restrictions are projected to have serious long-term implications for the mental health and well-being of a range of families and young children, including those who may not have been classified as vulnerable prior to the pandemic ('low risk').[1] We report results from a small study with parents of young children, originally designed as a case series to understand the experiences, feasibility and acceptability of the Headspace app (hereon, 'Headspace') – a self-delivered, mindfulness-based intervention (MBI). We present a qualitative report, as planned quantitative data collection was patchy, unreliable and uninterpretable in this small sample at this tumultuous time, but full qualitative data was achieved through one-to-one interviews. We aim to provide unique insight into the use of Headspace, as well as family well-being and parent–child relationships for these low-risk families over the period during and immediately after the first UK COVID-19 lockdown.

Parental stress and mindfulness

Already an existing crisis, the mental health of children and young people is of grave concern in the post-pandemic era,[2] with both internalising problems (such as depression, anxiety) and externalising (behavioural) problems seen as common concerns.[2] Parent-focused parenting strategies (for example harshness and criticism) are associated with both increased internalising and externalising problems in neurotypical children.[3] Parental stress can exacerbate the use of these negative parenting strategies,[4] making it a key target for intervention, arguably in particular as parental stress has been heightened by COVID-19.[5]

Mindfulness is characterised by non-judgemental awareness and acceptance of present-moment experiences.[6] MBIs aim to cultivate mindfulness through meditation practices and teacher-led discussion, with a wealth of evidence showing beneficial effects on stress, mental health and well-being, including self-help mindfulness resources, in non-clinical[7,8] and clinical settings.[9] The skills taught in MBIs have promise in the parenting context as, in addition to beneficial effects on stress, it is proposed that mindfulness improves emotion regulation, and self-efficacy[10] – furthering their potential to interrupt negative parent–child cycles.[11]

Mode of delivery

When delivered to parents, MBIs are most often delivered in group format, in person, and to families at risk for serious mental health difficulties, or to those with neurodiverse children who are thought to experience higher levels of parenting stress.[12] This is not surprising given that most MBIs are based on the clinical mindfulness-based stress reduction framework, which involves a high level of facilitator expertise.[13] However, self-directed MBIs are gaining ground, particularly in non-clinical settings, offering the potential for efficient approaches to intervention and prevention.[7] Demonstrating the efficacy of preventative interventions is acknowledged to be difficult,[14] but prevention is an increasingly

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key priority in mental healthcare and research in the UK,[15] and we argue may be of critical importance in the parenting setting for children's well-being. Yet, despite low-risk families not being entirely impervious to mental health challenges[16] – arguably particularly following pandemic-enforced social restrictions – there is a lack of research into the effects of online, self-delivered MBIs for parents of neurotypically developing children, in low-risk families.[12] We aim to bridge this research gap.

Online, self-delivered, interventions are proposed to be both more accessible and cost-effective than in-person approaches,[17] yet there are concerns in non-clinical populations around effectiveness and poor engagement.[18] Regarding mindfulness specifically, concerns are that practice without therapist guidance may result in a greater frequency of adverse events,[19] although this may be mitigated by using guided meditations.[20] We propose that increasing the acceptability of remote, self-directed interventions may lie in addressing preconceptions of digital tools, as hypothetical acceptability is often lower than actual acceptability on their implementation.[21] As these forms of intervention are relatively novel, there is a need for wider research to ascertain the best way to implement them in practice.[17]

The current study

Headspace provides self-directed content designed to support mindfulness practice alongside a broader suite of materials supporting mental well-being and performance (such as exercise and sleep) and is the best-evidenced self-help app available to the general population.[22] In randomised controlled trials, Headspace has been demonstrated in diverse adult populations to produce small between-group post-intervention differences in favour of Headspace compared with control groups for stress ($g = 0.24$), anxiety ($g = 0.21$) and depression symptoms ($g = 0.36$).[23] Although its effectiveness has been tested in a wide variety of clinical and non-clinical contexts,[22] despite its relevance and promise, nothing has yet been conducted with parents. Thus, we aimed to investigate the use of Headspace in a small number of low-risk families, collecting in-depth, qualitative data to ascertain parents' experiences of Headspace, and of family well-being and parent–child relationships, in order to answer the research question, what are parents of young children's experiences using a self-directed mindfulness app to manage their stress, in relation to their experiences of being a parent? The timing of data collection – during the UK's initial response to COVID-19 – additionally provided an insight into family life over the period when the first UK lockdown was beginning to be eased, and immediately after it had been lifted. Lockdown restrictions and data-collection points are visualised in Fig. 1, to contextualise the discussion of our results.

Method

Design

This study examined the use of Headspace by a small number of families in the UK, collecting in-depth, qualitative data and app usage data to ascertain its acceptability and usability. Written, informed consent was obtained from all participants.

Thematic analysis was employed as this method is not tied to one epistemological or ontological position, and is useful in identifying overarching themes across participant responses.[24] Coding was conducted in six stages[24] by the first author who also facilitated the data collection, utilising an iterative and inductive approach to the data to produce a rich and encompassing reflection of participants experiences. Collaborative confirmation of the final coding was made by the first and last authors. However, independent second coding was not conducted as we took a social constructionist approach to analysis, acknowledging the role of the researcher in the interview, and the perspectival nature of the findings.[24,25]

Ethics statement

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. All procedures involving human patients were approved by the Department of Psychology at Goldsmiths, University of London (Ethics Committee Approval: PS080120ABS).

Participants

Via social media, we recruited a volunteer sample of UK-based parents (aged over 18) of children aged 2–5 years old, with no self-reported, pre-existing, neurodevelopmental or mental health conditions, with access to an internet-enabled smart device, and no experience of meditation or use of Headspace in the past 6 months. A pre-determined sample size of 12 was achieved as this is proposed to be sufficient to incorporate into a thematic analysis,[26] and simultaneously small enough for the originally planned case series.[27]

A demographically homogeneous sample of 12 parents (from 12 families) were recruited, 11 of whom identified as White or White British, were married or cohabiting with a partner, and were mothers (one single parent and one father). Mean parental age was 42 years (s.d. = 3.58 years) and mean target child age was 3.5 years (s.d. = 1.08 years). Six (50%) participants reported being single-child households, three had a second child under 1 year old, and three had a second child older than 5 years. Most ($n = 11$) parents reported being educated to at least undergraduate degree level (half to either master ($n = 4$) or doctoral degree levels ($n = 2$)), and all parents were employed at the time of the study. Participants were given free access to Headspace for the duration of the study and were further incentivised on completion with a voucher worth £15.

Materials

The 5 minute speech samples (FMSS)[28] were collected from parents pre and post the Headspace intervention. Participants were telephoned or video-called and asked to talk for 5 minutes uninterrupted, answering the following prompt: 'Please tell me what you've been thinking and feeling about (your child) in the past two weeks. What your relationship with (your child) has been like, and how well you have gotten along with them in the last two weeks'. Participants also engaged in a semi-structured interview at a 2-week follow-up telephone or video call, lasting for between 30 and 45 minutes. The topic guide is available in the Supplementary materials.

Audio-recordings for the pre- and post-intervention FMSS and semi-structured interviews were transcribed and anonymised before being coded. As a result of the aforementioned impact of the fluctuations in social restrictions because of COVID-19 on the reliability and interpretability of our planned data, we did not quantitatively score these transcripts for pre-/post-differences. Instead, here, the FMSS transcripts were analysed in conjunction with the semi-structured interview transcripts to provide a rich insight into family well-being and the parent–child relationship in our small, low-risk sample at this tumultuous time in the UK.

Intervention

Headspace contains a wide variety of meditative and non-meditative content, including guided meditations, sleep aids, music/

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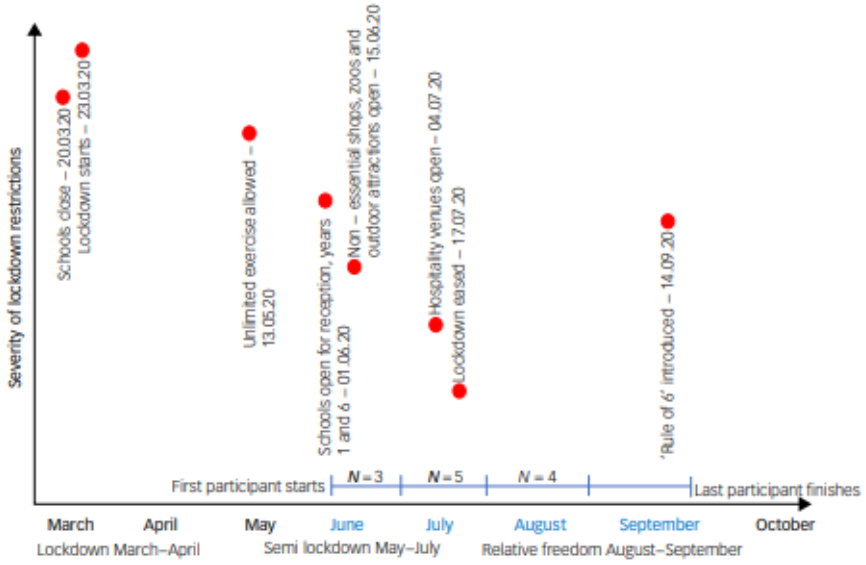

Fig. 1 Visualisation representing lockdown restrictions in the UK over the course of March 2020 to October 2020 and the impact on data collection.

This visualisation of the different stages of lockdown restrictions in the UK in 2020 was created by the authors of this paper using the dates of family-specific significant restrictions as recorded by the Health Foundation's COVID-19 Policy Tracker (2021). The 'Rule of 6' refers to a measure introduced by the UK Government intended to control the spread of COVID-19, meaning that apart from a limited number of exceptions (including, for example, work and education), any social gatherings of more than six people were against the law while the 'rule of 6' was in force. This was enforceable by the police, who were given powers to disperse such gatherings and fine attendees.

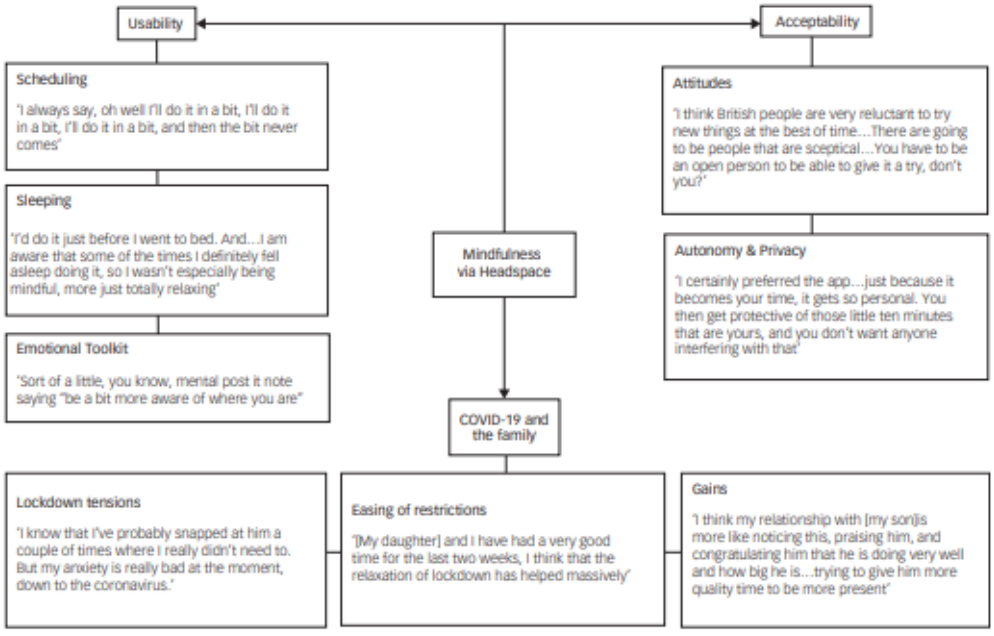

Fig. 2 Thematic map depicting the most widely discussed key themes and subthemes representing parents' experiences with illustrative quotes (see Supplementary Table 1 for more detail).

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sounds and short animations, as well as some content designed for parents and their children to do together. Participants were asked to complete the 'Basics' packages 1, 2 and 3 as a guided introduction to mindfulness. Each of these packages lasts for 10 days, thus the intervention period was 30 days. In the Basics package 1, participants were able to choose between 3, 5, or 10 minutes of meditation a day, and in Basics 2 and 3, from 10 or 15 minutes a day. No specification was given for the duration of the mediation chosen, and no limitations were placed on participants' use of the rest of the app's content.

Results

Supplementary Table 1 available at https://doi.org/10.1192/bjo.2021.1070 depicts the full results of the thematic analysis of both the FMSS and the semi-structured interview data. Fig. 2 visualises a thematic map of the key themes identified.

Acceptability and usability

Participants reported Headspace as acceptable and broadly feasible to do, a finding also evidenced by the high number of 'Basics' sessions participants completed out of the 30 they were requested to do (Mean 26 Basics sessions, s.d. = 11.84, ranging from 1 to 43 sessions). Six participants also used the sleep content (completing an average of 4 sessions, s.d. = 9.01, although the range was also large, from 1 to 29 sessions). Three participants also used the app with their children, although this was less frequent (completing an average of one children's meditation session, s.d. = 1.08, ranging from one to three sessions), with two participants also using the children's sleep content specifically (completing an average of one session, s.d. = 1.27, ranging from one to four sessions).

There were just two reports of negative experiences using Headspace, but these are important to note as they are not often recorded in the extant literature.[19] One participant reported associating physical sensations with breathing difficulties linked to asthma:

> 'Concentrating on my breath … I was getting … that sort of feeling of relaxation and sort of slightly … ugh it's not quite the right word, but almost … sort of … giddiness, I guess? … I would find myself worrying that I was getting that feeling not because I was meditating but because I was breathing incorrectly or something. Which I know is a strange thing that ties in with that feeling of asthma, and that feeling of, if I'm concentrating on my breathing, there's something hard-wired in my brain to be saying to me, what's wrong? … Are you ok? Are you breathing enough?' (P12)

Of note, there is some move away from using the breath as the only anchor point in mindfulness teaching,[29] and our results suggest that this may indeed be pertinent for some people. The other negative experience was centred around sleep disturbance. Although the participant did not report this as lasting, it is noteworthy as they found it to be distressing and negatively impactful on their perception of mindfulness:

> 'I was doing it last thing at night for quite a while, and I wasn't sleeping afterwards. It was waking me up, rather than calming me down … my husband noticed it and he was like, "you've got to stop doing them at night" … when I stopped doing that at night, it was noticeable that my sleep went back to being fine.' (P2)

This was markedly different from the majority of participants ($n = 11$) who reported the app to be beneficial for their sleep. Although noting a feeling that the meditation was 'gearing them up' for the day ahead, most parents ($n = 9$) nonetheless found it easiest to schedule into their night-time routine. Irrespective of the time of day, parents reported getting a better quality of sleep as a result of practising mindfulness, and, although not the intention, those using the app at night specifically spoke of being lulled into sleep more quickly as a result – and commonly of falling asleep during the exercise:

> 'I think if I'd been able to do that daily practice at the beginning of the day … it would have been even more helpful because, although … it was probably really helpful in terms of getting to sleep, … I think … my challenge was hanging on to it for the next day, and staying awake!' (P5)
> 'I definitely felt more patient, actually. I think it, I don't know whether it just helps me sleep … a lot quicker, and very soundly.' (P1)

Although our qualitative data suggests that parents experienced a reduction in stress over the course of this study, as a result of fluctuating government restrictions in the UK (see Fig. 1), it was not possible to determine whether these findings were a result of using Headspace, or a result of the timing of data collection. However, most parents ($n = 8$) attributed the reduction in their stress to be a result of learning to be mindful during an emotionally complex lockdown, including perceiving vicarious utility for their children's emotion management skills:

> ' … if I'm feeling fear, I can do this for me, if I'm feeling anxious, I can do this, I can focus, if I can't sleep, I've got these tools. That's how it feels to me, it's like a whole load of tools, I've got some extra tools in my belt now, as a parent, that I can use to make me a more rational parent, a calmer parent, a more focused parent, and [we are] starting to get some of those tools into my daughter's bag that's going to help her regulate her emotions and communicate clearly what she needs and what she feels. So, I think I'm very grateful for the experience that we had.' (P4)

Further to most parents reporting the intervention as helpful, its method of delivery – i.e. self-directed via an app – was also evaluated positively ($n = 11$), with some participants explicitly describing it as preferable to participating in person because of the privacy and autonomy, as well as the convenience, of being able to access the intervention on their phone:

> ' … it was quite nice to be able to do it without anyone there that could potentially judge, I guess. Nobody had to know I was doing it, whereas, if you go to a group, they do … ' (P2)
> 'I think it's actually quite a vulnerable thing. Like just sitting there in silence, like, you know, it only takes one person to cough, or sniff, or, and … I think I'd step out of where I was quite quickly. But, with this, you know, you're in your own world which I really like.' (P1)

COVID-19 and the family

We found Headspace to be widely reported as both feasible in parents' daily life and acceptable ($n = 11$). However, some parents ($n = 6$) explicitly stated that the specific – and unforeseeable – timing of our study in terms of COVID-19 had an impact on their experiences. Some ($n = 2$) explained that they would have found it more useful to have tried this in advance of the lockdown:

> 'I think it's quite an interesting study for this time. I think if it had've been a year earlier, it would have been very useful for COVID!' (P2)

Others ($n = 4$) found that, in fact, access to Headspace was timely:

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'… it's unfortunate your study's coming now, but in terms of the lockdown, and like people being isolated and alone … there's some amazing content on there.' (P1)

We were also able to gain some insight into the impact of COVID-19 specifically in terms of participants' relationships with their children. Strikingly, these experiences can be delineated into the different stages of the lockdown during which they participated – immediately following the full UK lockdown, followed by the relaxation of rules in the summer and then the transition for children back into school and nursery (see Fig. 1 for the numbers of participants recruited at each stage).

Semi-lockdown: June and July 2020

Semi-lockdown was largely considered a period of significant uncertainty. Family tensions directly attributed by parents to the effects of the pandemic were most often ($n = 7$) reported as difficulties caused by the various and fluctuating Governmental rules during this period:

'In all honesty, the past two weeks have been a little bit tricky … I think the current situation we're in in terms of a semi-lockdown could be part of the problem. [My son] … seems to be struggling a little bit … maybe a little bit more frustrated at times.' (P5)

'… we'll see some of his friends, but we can't see other friends … he's finding that harder to understand, and therefore there's been more sulking and tantrums going on. Because sometimes we can go, and sometimes it's a no, and I can see how that's harder to understand.' (P7)

For some ($n = 4$), these tensions were gendered, in that mothers reported feeling the burden of responsibility fell to them rather than their partners, as intense pressure and guilt to be both a mother and balance work, as well as household administration:

'I'm just at the computer and I'm on the phone to people, which is horribly dull, and I always feel really bad. But at the moment, I can't help it – we are just juggling things … I'm often the one that's not doing the fun things … I have to be the practical one, I have to be the one working, I have to be the one juggling things.' (P5)

School summer holiday: August 2020

Over the summer holiday, some family pressures were relieved by being able to take time off during a period when restrictions were significantly reduced. The most notable reported change was on the quality of children's sleep and their behaviour ($n = 4$):

'… we've been on [summer] holiday … So we took her to the park, and we took her to the zoo, we went out and played in the local playground in the place where we went to go and stay and she … just absolutely adored every second. And I think that it's just so lovely to see her light up and wake up every morning and have had, you know, 12, 13 h of sleep and 3 h naps a day just because she's been so wiped out from having so much fun.' (P1)

In addition, the role that access to extra-familial support played in improving their children's behaviour was widely reported ($n = 11$):

'We had a visit from his Aunt yesterday, and, you know, he was just delighted, and the change to his behaviour was quite stark.' (P4)

'… now we're sort of gone through lockdown, my mum has sort of been looking after [my daughter] and that has a massive impact on my relationship and how we are together, like how I view her, because I've got time away as well. And you can have that little break and come back to it and you're like oh my gosh I've missed you so much! These are all the things I love about you!' (P3)

Return to school: September 2020

Some parents ($n = 7$) reported finding their children's return to nursery or school to be challenging – especially following the extended absences earlier in the year, and the continued difficulties in accessing regular child care:

'… we've been doing a fair amount of preparing for school, there's been a bit of a balancing act that we haven't had for a very long time because of COVID, of my husband starting back at work in his school, so therefore having to work out child care with our usual methods not being quite as accessible as they were before. So, that's been a little bit of a struggle …' (P2)

The consequences of school returns were experienced by some ($n = 3$) as difficulties with sleep once again:

'I think, you know, coming alongside going to nursery and being so stimulated [after lockdown ended], her sleep hasn't been amazing which is really unlike her. So, we've had a handful of really bad nights which, honestly, was absolutely draining and exhausting.' (P1)

Relative freedom: August to September 2020

Importantly, however, there were also reports of positive experiences during the pandemic, notably on participants' perceptions of their children, and their attitude to life more broadly. For example, some mothers ($n = 6$) noticed and appreciated the sensitivity of their child to their – the mother's – distress, and the resultant empathy after what has been a difficult year at home:

'… he saw me crying because I … had enough, I was too overwhelmed with work, and he comes to me and says – he gives me a cuddle, and says – 'Mummy, I'm here'. Like the same way that I do when he is upset … and it was so sweet. He is a good boy.' (P8)

'He has been really good since I was poorly last week, and he likes to pretend to be a doctor. So, he'll come along with his toys and he'll go, "open your mouth", and check me out, and he's really caring – finishes it off with a sticker for being a good girl, and off he goes again.' (P11)

Appreciating the 'little things' was also reported by parents ($n = 7$) as a change to the way they perceived their family that they may not have experienced without the enforced lockdown:

'I think COVID's really helped in the kind of simple pleasures and the simple joys of just appreciating on a child's level maybe, which is often quite tricky in a busy life. COVID's given us a chance to calm down a bit and have a reset.' (P2)

'We've had a couple of little 'sleep overs' [with each other, during lockdown], which is her favourite activity at the moment … So, she'll only go to bed about an hour later than she normally would, but it's so special for her because there's so few things we can do, so that's really nice.' (P2)

Discussion

In a low-risk – i.e., well-educated, socioeconomically advantaged – UK sample, we explored the use of a self-directed meditation app, Headspace. We provide preliminary, qualitative evidence that these parents found Headspace to be both feasible and acceptable. Parents also perceived a positive impact of learning mindfulness on their emotion regulation skills and stress tolerance. We discuss our results in terms of the utility of Headspace, but arguably of greatest interest is that the nature and timing of data collection,

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although having a negative impact on our study plans, provided key insights into life for low-risk families at an unsettled time in the UK because of COVID-19. These novel insights are important for understanding the impact of COVID-19 and associated restrictions on families who may not have been classified as vulnerable pre-pandemic[1]. Our results are discussed in the context of assertions that, for socioeconomically disadvantaged children and their parents, the risk of adverse consequences are likely far greater.[30]

Headspace for families

We found encouraging parent perceptions of effectiveness, and adherence to, Headspace, although we note these are very preliminary findings in need of replication with robust study designs and larger, more diverse samples. Importantly, caution in generalising is advisable, not only in light of our privileged and self-selecting participants, but also as they had multiple contacts with researchers that may have positively influenced intervention effects and app adherence.[23] Nonetheless, our findings offer some support for previous assertions that online MBIs can have beneficial effects on stress,[31] as well as for the suggestion that hypothetical acceptability of digital interventions may be lower than actual acceptability.[21] We speculate our findings also hint at the potential utility of remote MBIs in the post-pandemic era, although again we remain mindful that the nature of our sample provided the requisite cultural and financial capital supporting greater adherence to self-directed interventions.[32] As such, we emphasise the importance of robust testing of Headspace with a more diverse sample of parents to better understand its effects in a more pragmatic context.

Mechanisms of action

One of the mechanisms by which mindfulness is thought to improve family functioning is via non-judgemental attention of the self and child, such attention fostering an awareness of the distinction between perception and affective response.[11] It is therefore interesting that, following Headspace, parents in our sample specifically spoke about appreciating 'the little things', and their perceptions of the value this perspective added to interactions with their child. This is supported by previous research suggesting a dispositional capacity to maintain a focus on the present is associated with reductions in parental coercion and improvements in parental warmth.[10] This present-moment focus may also go further and be indirectly related to improvements in parenting and family functioning by reducing impulsivity, improving marital and co-parenting relationships and depressive symptoms.[33]

It was, however, difficult to tease apart the effects of the Headspace sleep content from the mindfulness content in our sample as half the participants used both, and many participants reported incidentally finding the mindfulness content to be a sleep aid. This was reported both as parents perceiving experiences of better quality of sleep owing to improvements in emotion regulation after practising mindfulness, and as an incidental aid to sleep whereby parents fell asleep during the exercise as they found it very soothing. If replicated, this may be of importance since evidence suggests practising mindfulness is itself associated with improved sleep and decreased sleep-interfering cognitive processes such as rumination.[34] However, this evidence is heterogeneous and does not clearly demonstrate direct effects on sleep quality and duration.[34] As such, more research is required to investigate the mediators and moderators of the effects we anticipate following a mindfulness intervention for parents of young children.[35] Specifically, the inclusion of measures of mindfulness will help to better understand the mechanism by which parents experience improvement in their sleep.

COVID-19 and 'low-risk' family life

Despite the fact that our small sample was demographically homogeneous and socioeconomically advantaged (for example none of the parents reported economic loss ensuing from the restrictions), our qualitative findings revealed parent perceptions of a substantial negative impact of COVID-19 and associated measures on their families' well-being. The reported experiences of increased parenting stress in these families is striking when considered in their low-risk context, as the effects of the pandemic on family life are likely to be highly influenced by socioeconomic circumstance: families less economically and socially 'well placed' may be expected to have been faring worse.[36]

Contrarily, it is possible that more advantaged parents experience perceptions of difficulties – albeit from different sources than those less economically advantaged – that nevertheless have an impact for these families. For example, research with parents from high-income countries with higher educational attainment has demonstrated that they spent more time parenting their children than other parents, arguably a function of both more flexible jobs, and societal pressure.[37] These pressures may have been directly exacerbated as a result of the pandemic-induced shift to home working and home schooling and may therefore be a unique risk factor for families of higher socioeconomic status. We also propose that pandemic-related difficulties faced by low-risk families may be more transitory than those at higher-risk, because of the greater personal, financial and social resources available to them.[38]

Although health inequalities following pandemics are most notable for people living in poverty as opposed to privilege,[39] the far-reaching effects of COVID-19 restrictions on family life are apparent even in these low-risk families. In particular, challenges were often reported related to sleep difficulties (of the parent or child). Importantly for stress management, previous findings suggest a lower quality of parental sleep is associated with higher levels of stress, as well as less observed positive parenting.[40] We therefore theorise that Headspace-induced improvements in sleep (as well as mindfulness, as discussed above) may also have the potential to reduce parental stress and increase positive parenting, in turn potentially improving child adjustment outcomes.

Limitations

Although we offer evidence that the use of Headspace to manage parental stress was both acceptable and feasible for parents of young children in our sample, we acknowledge the limitations of this study. In addition to the aforementioned effects of data-collection timing and the low risk, privileged nature of our sample, all of which limit generalisability, our participants used the app in a variety of different ways, accessing content in addition to the basic mindfulness packages they were directed to use. It was therefore difficult to ascertain what parts of the app, if any, were responsible for reported stress reductions. Moreover, although qualitative work is an essential step in evaluating the effectiveness of a novel intervention,[27] the limitations of our design, in conjunction with COVID-19-induced study limitations, are acknowledged. As such, although we posit the theoretical promise of Headspace for reducing parental stress and in turn improving children's outcomes, the current study was not designed to test this, and we emphasise that robust and diverse research in this area is needed. We aim and hope for the current study to be a springboard for more rigorous, well-powered, randomised controlled studies.

Implications

COVID-19 is likely to have a long-lasting and widespread impact on the availability of preventative physical and mental healthcare while

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health services recover from emergency-oriented care.[41] Previously, mindfulness has been demonstrated to be beneficial for both parent and child outcomes, via reductions in stress and improvements in emotion regulation.[15,16] Here, we provide preliminary support for the acceptability, feasibility and utility of an online, self-directed MBI for parents experiencing stress. We suggest it should be a priority to build on the current findings in diverse families, but particularly for families who were vulnerable before the pandemic, and are now significantly more at risk.[2] In addition, better understanding of the relationship between sleep and mindfulness in family dynamics and well-being will be key. In so doing, we hope that mindfulness-based apps, such as Headspace, may prove to be accessible, inexpensive and potentially useful self-directed interventions for parental stress and ultimately child well-being and mental health for diverse families.

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Supplementary material

Supplementary material is available online at https://doi.org/10.1192/bjo.2021.1070.

Data availability

The data that support the findings of this study are available on reasonable request and with appropriate confidentiality restrictions from the corresponding author, A.B. The data are not publicly available owing to their containing information that could compromise the privacy of research participants.

Acknowledgements

We thank Headspace for providing access to the app and usage data. The opinions and assertions contained herein are the views of the authors, and should not be construed as reflective of those of Headspace. We would also like to thank the participants who generously gave us their time for this study.

Author contributions

B.R.O. conceived the original overarching research question, B.R.O. and K.C. conceived the study design and revised the manuscript. A.B. contributed to formulating the research question and study design, completed data collection, conducted analysis and wrote the manuscript. C.S. contributed to the manuscript concept and provided critical support and revision of the manuscript.

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Declaration of interest

A.B. conducted this work as part of a collaborative PhD studentship with the industry partner Headspace. Headspace provided free access to the app for participants, but were not involved in data collection, data analysis or in approving the final manuscript.

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Appendix G

Project 3: Recruitment Poster

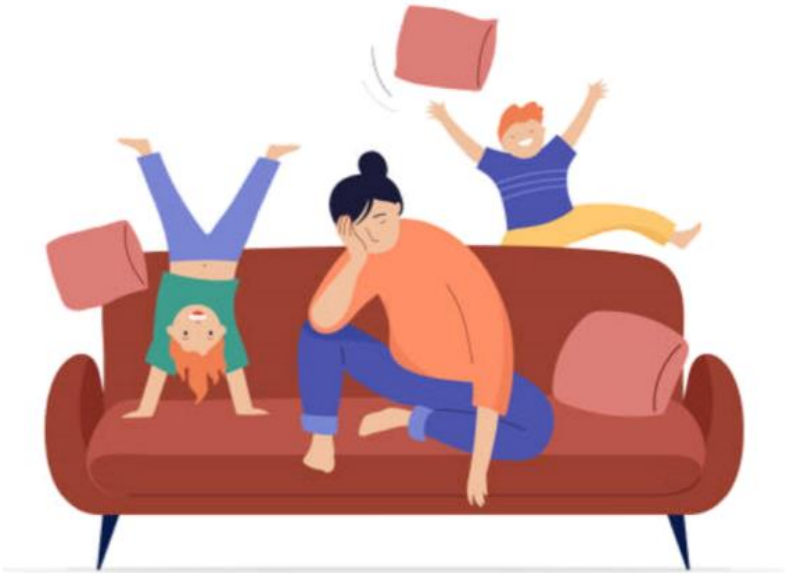
[redacted]

Are you the parent of a 2 to 5 year old?

Feeling stressed?

Join our study at UCL to see if using the Headspace app for free for the duration of the study can help you.

Email me: [ ]



Appendix H

Project 3: Generic Participant Email Templates

Time	Attachments	Body
Screening (if applicable)	REDCap Link	Thank you so much for your interest in our study! If you wouldn't mind filling in our screening questionnaire using this link: https://redcap.idhs.ucl.ac.uk/surveys/?s=KWFKD3DAEAENRC9R, then if you're eligible for the study, I will send you the details for participating.
Phone Call	Participant Information Sheet Welcome Video	Thank you so much for filling out the screening questionnaire! We would now like to arrange a phone or video call with you to talk through the study, and to answer any questions you might have. This will be a quick chat, so it shouldn't take any more than 10 minutes of your time. Please do let me know what day and time you would like this to happen--I can do evenings and weekends too if this helps! If you find it easier to schedule this with me via text, please do use the number in my signature ( ). In the meantime, please watch this short video: https://www.dropbox.com/s/wuw8j6bd64656g6/Welcome%20to%20the%20Headspace%20for%20Parents%20Study.mp4?dl=0, and read the participant information sheet attached to this email, to find out a bit more about what participating in our study might mean for you.

First Questionnaire	REDCap Link	Thank you for making the time for me to call this …! Here is the link to the first questionnaire: …. When you've had a chance to fill that out, I'll randomly allocate you to one of the three groups and send you the relevant instructions.
Allocation	Access and Instruction Sheet Code Introduction Video App Map	Thank you so much for completing the first questionnaire! You've now been randomly allocated to one of the three groups we talked about (please find the instructions attached). Below is your access code which you will need to sign up to *Headspace* for free: … You can sign up here https://www.headspace.com/code using an email address you've never used with *Headspace* before. You can also watch this short video explaining what will happen next …, and I'll be in touch again in 10 days' time with another video.
Day 10	Day 10 Video	Just a quick one to say you've now been part of the *Headspace* for Parents' study for 10 days! Watch a video about that here: …
Day 20	Day 20 Video	It's been another 10 days! That means we're at 20 days and you are now halfway through using the app. Watch a video about that here: …

Day 30	Day 30 Video	This email is to let you know that you've now been part of the *Headspace* for Parents' study for 30 days! Don't worry if you haven't finished using the app--you've got another 10 days. Watch a video about that here: …
Intervention Ends	Day 40 Video REDCap Link Map Picture	You've now finished using the *Headspace* app! Don't worry if you didn't fit all 30 sessions in, you can watch a video about it here: … We'd now like you to fill in the second questionnaire, available here: … Once you've done that, I'll leave you alone for 3 months before I send you the final questionnaire.
Follow up	REDCap Link	It's been 3 months since I last emailed you, so that means you're very nearly done participating in the *Headspace* for Parents' study! We just need you to fill in one final questionnaire, available here: …
Debrief	Debrief Video Reimbursement Code Prize Draw Q	You've now finished taking part in the *Headspace* for Parents study! We hope you enjoyed using the app. If you'd like to keep using it, you can get another 6 months' access for free using this code: … If you'd like to know what the next steps are for this research project, you can watch this video: … And finally, if you'd like to be entered into the prize draw to win one of four vouchers worth £50, please reply to this email and I'll confirm your name is in the draw. Once again, many thanks for taking part in the *Headspace* for Parents study, this research would not be possible without the generous time you've given us.

Appendix I

Project 3: Participant Information Sheet and Consent Form

Institute of Education

UCL

Participant Information Sheet for Parents

UCL Data Protection Registration Number: Z6364106/2020/11/91

YOU WILL BE GIVEN A COPY OF THIS INFORMATION SHEET

Title of Study: Headspace for Parents – A Randomised Controlled Trial

Department: Psychology and Human Development

Name and Contact Details of the Researcher(s): Abigail Burgess,

Name and Contact Details of the Principal Researcher: Dr Bonamy Oliver,

You are being invited to take part in a study about mindfulness in parenting at the Institute of Education, University College London. This study is being conducted as part of PhD studies, in collaboration with the Headspace company. Before you decide whether or not you want to take part, it is important to understand why this research is being done. Please take the time to read the following information carefully.

1. What is the purpose of the project?

Parental stress can affect the whole family. Mindfulness has been shown to reduce stress in a variety of different contexts, but there is not much research using it with parents. The aim of this study is to test the effectiveness of parents of young children using Headspace, a smartphone app designed to support the practice of daily mindfulness to help with stress. We are interested whether the app can help parents' and child's wellbeing, and will provide all families with the app for free for the duration of the study.

2. Why have I been chosen?

We're inviting parents of children aged 2-5 years old who are normally resident in the UK and fluent in English to take part. We want to make sure that both parents and their children don't have a neurodevelopmental condition and aren't currently receiving treatment for a mental health condition. We are also asking for only parents who have not regularly practiced mindfulness or meditation in the last 6 months, and who haven't used Headspace before. We're looking to find 180 parents to take part in this study.

3. What will happen if I take part and what are the benefits?

You will be asked to fill in an online questionnaire about your stress levels, your relationship with your child and your child's behaviour (approximately 15 minutes long) three times during the course of the study.

After you've answered the first questionnaire, you will be randomly allocated one of three groups. In one of the groups, we will ask you to only use a specific mindfulness package on the Headspace app which will involve meditating for up to 10 minutes a day for 30 days (you will be given 40 days to do this). In another group, you will be asked to explore the Headspace app more widely for 30 days, and will be given 40 days to do this. If you are allocated to either of these groups, after the 40 days, we

will receive data from Headspace about what parts of the app you used and how long for. Then we will ask you fill in the second online questionnaire, and a final questionnaire 3 months later. In the third group, we will ask you to fill in the same 3 questionnaires while you wait to get access to the app.

If you are allocated to the waiting list group, after you have filled in the 3 questionnaires and waited for 4 months, you will be given access to the Headspace app for the same length of time as the other two groups received. When using the app, it's important to remember that if your device is not connected to WiFi, it will use your data plan, however, practises can be downloaded and listened to offline.

Irrespective of which group you are randomly allocated to, if you complete all three questionnaires, you will be given the choice to enter a prize draw to win one of four vouchers worth £50.

Previous participants have reported that using Headspace helped them better manage their stress. More broadly, we hope that this research will help us understand and reduce the effects of stress for other parents and their children. We also hope we might be able to improve access to preventative interventions for families who have fewer resources to do mindfulness training in-person.

4. What are the possible disadvantages and risks of taking part?

We do not foresee any disadvantages to your taking part. However, some people do not like doing mindfulness, or answering questions about their family. It is very unlikely for there to be any adverse effects resulting from you using the app, but if you experience any distress or discomfort during the study, you are free to withdraw at any time without giving a reason.

5. Do I have to take part?

No! In our experience families find taking part in our research interesting, but it is entirely up to you to decide whether or not to do so. If you decide you would like to take part, we ask you to give your formal consent, but even then you can opt out or withdraw from the study at any time during data collection without giving any reason and without any consequences. If you do withdraw, you will be asked what you wish to happen to the data you have provided up to that point.

6. **What if something goes wrong?**

If you have any concerns about your participation or about the study in general, you should first contact the Researcher, Abigail Burgess or her supervisor, Dr Bonamy Oliver, using the details listed above. If you have experience any distress or discomfort during the study, we advise that you contact the research team immediately in the first instance. However, if you would like further support, the NHS provides a range of useful contact details for managing distress, available here https://www.nhs.uk/oneyou/every-mind-matters

If you wish to raise a complaint, in the first instance please contact Abigail Burgess, or her supervisor, using the details listed above. If you feel your complaint has not been handled to your satisfaction, you can contact the Chair of the UCL Research Ethics Committee at

7. Will my taking part in this project be kept confidential?

Yes. Once it has been collected and processed, your data will be fully anonymised so that no identifying information will be linked to the data you provide, and you will not be identifiable in any reports or publications. Identifiable data (your name, email address, date of birth) will be accessed by authorised persons in the research team for research purposes only. All data will be stored securely at UCL, in full compliance with data protection legislation.

Data from the whole study will be collated into an anonymised dataset, from which no individual can be identified. This anonymised dataset will be made available to future researchers in a central data repository - the UK Data Archive. The UK Data Archive is based at the University of Essex and is funded by the Economic and Social Research Council (ESRC). This ESRC funded PhD project requires anonymised data to be open and accessible to improve the quality of this and future research.

8. Limits to confidentiality

Please note that assurances on confidentiality will be strictly adhered to unless evidence of wrongdoing or potential harm is uncovered. In such cases the University may be obliged to contact relevant statutory bodies/agencies. If this was the case, we would inform you of any decisions that might limit your confidentiality.

9. What will happen to the results of the research project?

The results of this study will be used in a thesis submitted as part of a PhD at UCL, and published in academic publications as well as presented in academic and layperson talks. You will be able to opt in to us providing you with a copy of any publications that have used the data should you wish. It will not be possible to identify you in any way in these publications.

Fully anonymous data from this study may be used by subsequent researchers as a result of it being stored for future use at the UK Data Archive.

10. Local Data Protection Privacy Notice

The controller for this project will be University College London (UCL). The UCL Data Protection Officer provides oversight of UCL activities involving the processing of personal data, and can be contacted at

This 'local' privacy notice sets out the information that applies to this particular study. Further information on how UCL uses participant information can be found in our 'general' privacy notice, please follow the link to access it here.

The information that is required to be provided to participants under data protection legislation (GDPR and DPA 2018) is provided across both the 'local' and 'general' privacy notices.

The categories of personal data used will be as follows:

Name
Email Address
Telephone Number
Date of Birth
Ethnicity
Marital Status

The lawful basis that will be used to process your personal data are: 'Public task' for personal data and 'Research purposes' for special category data.

Your personal data will be processed so long as it is required for the research project. If we are able to anonymise or pseudonymise the personal data you provide we will undertake this, and will endeavour to minimise the processing of personal data wherever possible.

If you are concerned about how your personal data is being processed, or if you would like to contact us about your rights, please contact UCL in the first instance at

Only the immediate research team will have access to your personal data. No data you provide will be transferred out of the EEA for any purpose.

11. Who is organising and funding the research?

This research has been organised by Abigail Burgess and her supervisor Dr. Bonamy Oliver. We are working in collaboration with the company Headspace, who will provide us with data on how the app is being used, but they are not providing any funding. This PhD is funded by the ESRC, and has been given ethical approval by the Psychology and Human Development Department of the Institute of Education at UCL.

12. Contact for further information

Your first point of contact should be the primary research, Abigail Burgess using the details above.

You will be provided with a copy of this information sheet for your reference. You will be asked to provide consent as part of the online questionnaires, and you will be able to choose to download a copy of this for your records.

Thank you for reading this information sheet and for considering taking part in this research study.

Headspace for Parents (1)

AAA

Please complete this form after you have listened to an explanation about the research, and read the information sheet we've provided.

I confirm that I understand that by selecting the "yes" option below that I am consenting to this element of the study. I understand that it will be assumed that unselected options means that I DO NOT consent to that part of the study. I understand that by not giving consent for any one element that I may be deemed ineligible for the study.

* must provide value

- ○ Yes
- ○ No

reset

I confirm that I have understood the Information Sheet for the Headspace for Parents study. I have had an opportunity to consider the information and what will be expected of me, and to ask questions which have been answered to my satisfaction.

* must provide value

- ○ Yes
- ○ No

reset

I understand the inclusion and exclusion criteria as detailed in the Information Sheet and explained to me by the researcher, and I do not fall under the exclusion criteria.

* must provide value

- ○ Yes
- ○ No

reset

I understand the potential risks of participating and the support that will be available to me should I become distressed during the course of the research.

* must provide value

- ○ Yes
- ○ No

reset

I understand the direct and indirect benefits of participating.

* must provide value

- ○ Yes
- ○ No

reset

I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason, and without my legal rights being affected. I understand that I will be able to withdraw my data up until the point it has been anonymised, after which it will no longer be possible to identify me to withdraw it.

* must provide value

- ○ Yes
- ○ No

reset

I consent to the processing of my personal information (name, email address, telephone number, date of birth, ethnicity, and marital status) for the purposes explained to me. I understand that such information will be handled in accordance with all applicable data protection legislation. I understand that after it has been processed for this trial, the data I provide will be stored anonymously and securely. It will not be possible to identify me in any publications. * must provide value	○ Yes ○ No	reset
I understand that all personal information will remain confidential. * must provide value	○ Yes ○ No	reset
I understand that my information may be subject to review by responsible individuals from University College London, or the ESRC, for monitoring and audit purposes. * must provide value	○ Yes ○ No	reset
I understand that the data collected as part of this study will not be made available to any commercial organisations but is solely the responsibility of the researcher(s) undertaking this study. * must provide value	○ Yes ○ No	reset
I am aware of who I should contact if I wish to lodge a complaint. * must provide value	○ Yes ○ No	reset
The following items are optional, if you do not agree, they will not affect your participation in the study.		
I would be happy for the anonymous data I provide to be stored at the UK Data Archive, based at the University of Essex, and funded by the ESRC.	○ Yes ○ No	reset
I understand that other authenticated researchers will have access to this anonymised data.	○ Yes ○ No	reset
I understand that the information I have submitted will be published as a report and I wish to receive a copy of it.	○ Yes ○ No	reset

Appendix J

Project 3: Introductory Call Script

Thanks for your interest in our study! Before we go any further, I want to tell you a bit more about the study. If you have any questions, please do ask me!

You've been asked to take part because you're a parent of a child aged 2-5 years old and we're interested in seeing whether the *Headspace* app might help families. In our first study, the parents we spoke to really enjoyed using the app and enjoyed being participants with us. We hope you'll feel the same, but it's important we make sure you know some of the key points before we start.

After we've finished chatting today, I'll send you a link to an online questionnaire. In it, we will be asking questions about how things are for you at the moment (including the current impact of coronavirus), your relationship with your child and your child's behaviour. You'll be asked to fill in the same questionnaire 3 times over the next 4 months.

After you've filled in the first questionnaire, I'll randomly allocate you to one of three groups. In the first two groups, you'll get to use the *Headspace* app straight away. In the third group, you'll be placed on a waiting list for about 4 months, after which time you'll get access to the *Headspace* app for the same amount of time as the other groups did. It's important for the trial that you're randomly allocated, this is done electronically so I won't know what group you'll be put into, and by signing the consent form in the first questionnaire, you're letting us know that you understand you might be put on a waiting list and are happy to continue. All three groups will do the same questionnaire at the same times (40 days after the first one, and again 3 months later). No matter which group you're in, you'll get the chance to enter the prize draw to win one of four £50 vouchers. If you're in group 1 or 2, we need you to follow the instructions we give you carefully, and we need you to stop using the app once the 40 days is over to make sure we're able to measure your responses accurately.

You should know that the *Headspace* app is widely used by many different people, and we don't expect you to have any adverse experiences while using it. If you were to experience any distress related to our study, we'd like you to stop and get back in contact with us as soon as possible so we can make sure you're given the support you need. You can also follow the link in the information sheet to the dedicated NHS mental health and wellbeing website if you want more support.

Whatever group you're allocated to, your personal data will be held securely at all times and will only be kept for as long as we need to use it to get in contact with you, and no longer than that. You are under no obligation to finish this study and you can withdraw at any time without any consequences. Before we process your questionnaire answers and anonymise them, you can also choose what happens to any data you've given us up until the point you withdraw from the study.

Do you have any questions about anything you've heard or read so far?

Appendix K

Project 3: Mindfulness Group App Access Instructions and Road Map

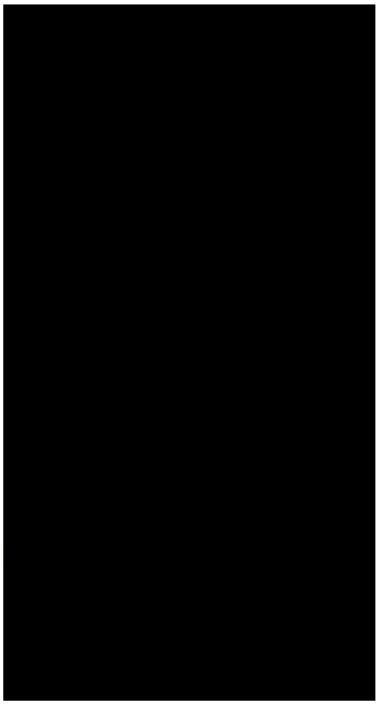
Headspace Access Instruction Sheet

For the next 40 days, we'd like you to only use the Headspace app to complete the **basics packages 1, 2 and 3**. Each package lasts for 10 days, so you'll be meditating for 30 days in total. It will be most helpful for you if you try and use the app as close to everyday as you can.

Please DO NOT access any other content on the app, and please DO NOT use the app with your child.

Once you've downloaded the app, please start on the first "basics" package, as shown in the last screenshot. This will take you 10 days to complete, and the instructions on how to access it are available below.

First, download the app from the Apple or Google Play store by searching for "Headspace". For this study, please make sure you sign up using an email address you've never used with the app before. To redeem your access code, go to https://www.headspace.com/code.

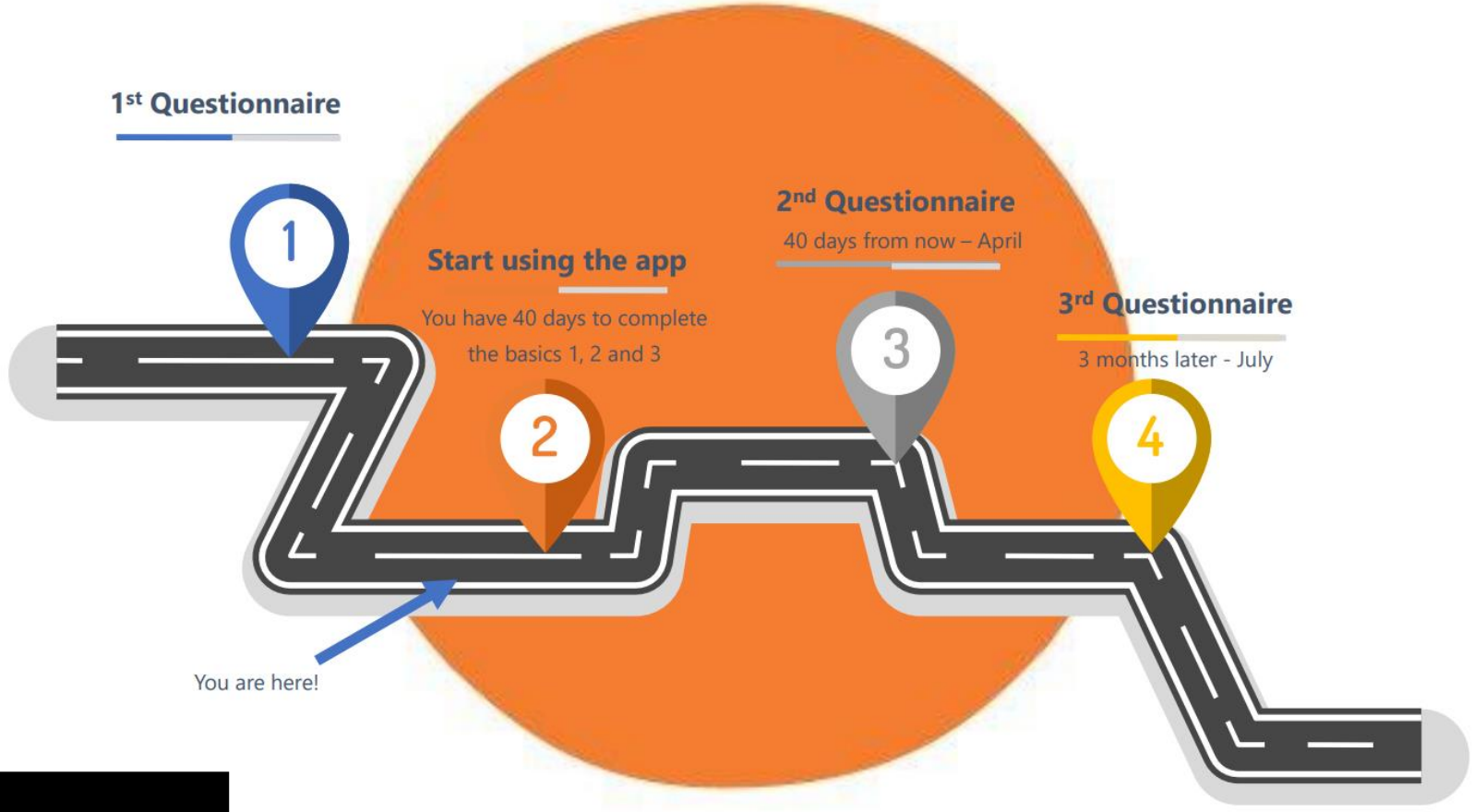


1. Once you have the app open, navigate to the "meditate" section, at the bottom of the screen.

Please only use the "today" or "meditate" pages to access the beginning meditation section. Once you've started on the "basics", it should be pinned to your home screen so you won't have to search for the next package.

2. On the "meditate" page, the basics packages should be the first option. You may also find it under the "featured" section.

3. If you can't find the sections described here, you can type "basics" into the search function at the top right of the page. This will take you straight to the basics packages. Start on the first one.
4. When you select the first "basics" package, you will be able to choose the voice you want to guide you. The basics 2 and 3 courses should automatically show when you complete the previous package—your progress is logged by the green ticks on each session you've completed. If the next basics package doesn't automatically load, you can use the search function again in the top right of the "meditation" screen.


1st Questionnaire
1
Start using the app
You have 40 days to complete the basics 1, 2 and 3
2
2nd Questionnaire
40 days from now – April
3
3rd Questionnaire
3 months later - July
4
You are here!

[redacted]

Appendix L

Project 3: Sleep Group App Access Instructions and Road Map

Headspace Access Instruction Sheet

For the next 40 days, we'd like you to only use the Headspace app to access the **sleep content** for at least 10 minutes a day on 30 separate days. It will be most helpful for you if you try and use the app as close to everyday as you can.

Whilst you are able to use any part of the sleep section on the app that interests you, please DO NOT access any other content on the app, and please DO NOT use the app with your child.

Once you've downloaded Headspace, please navigate directly to the sleep section of the app. Instructions on how to find it are available below.

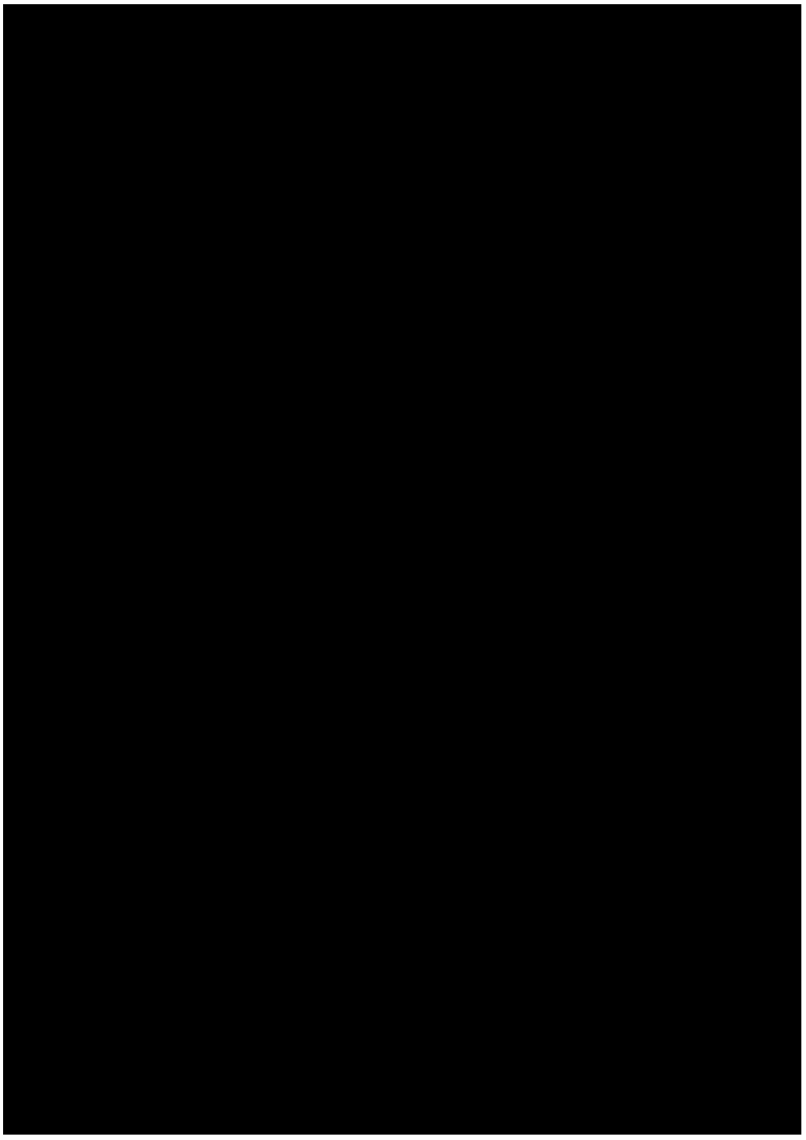
First, download the app from the Apple or Google Play store by searching for "Headspace". For this study, please make sure you sign up using an email address you've never used with the app before. To redeem your access code, go to https://www.headspace.com/code.

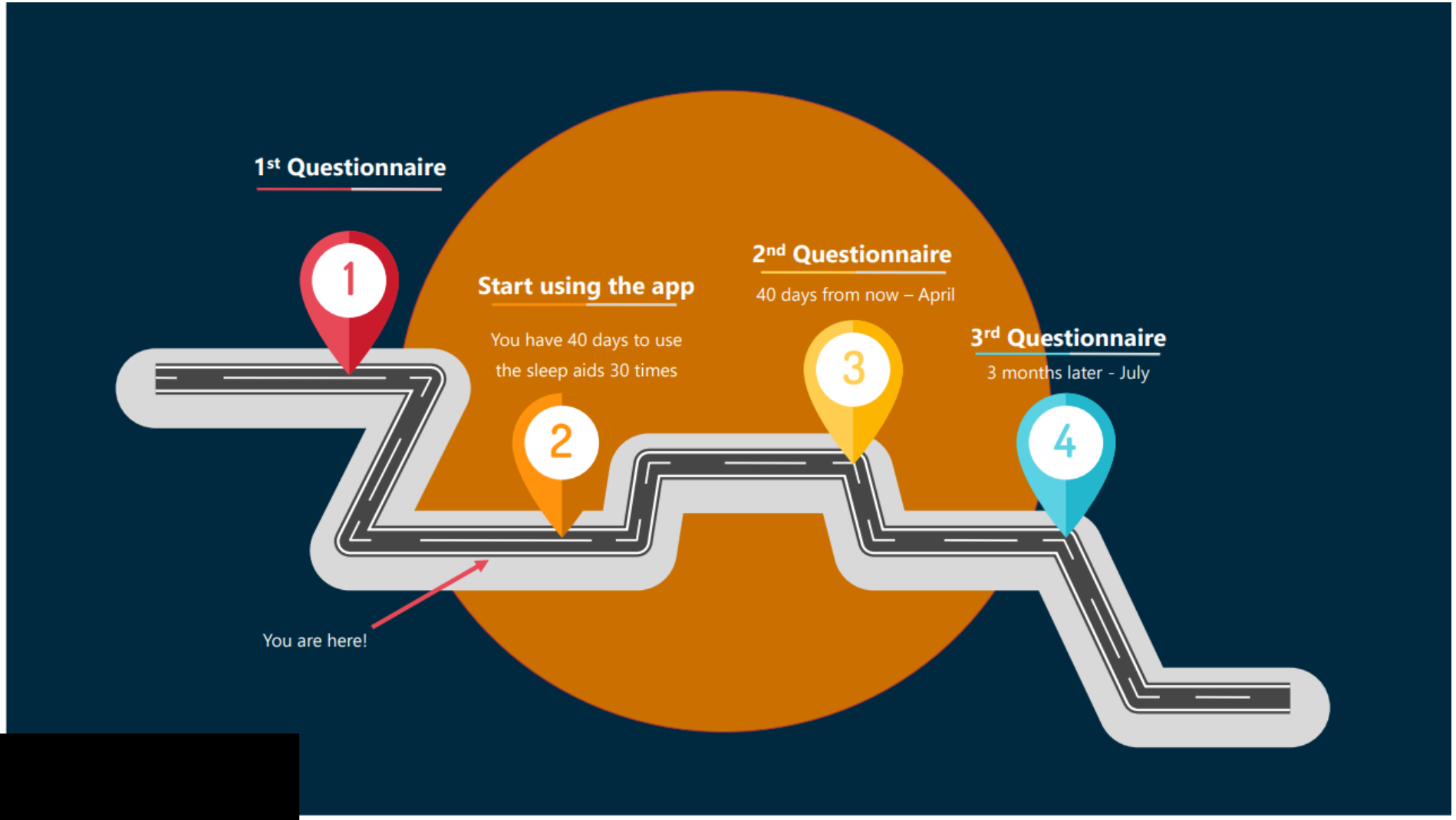
1. Once you have the app open, navigate to the "Sleep" section, at the bottom of the screen.

Please only use the "sleep" page to access the sleep content. Here you can see all the sleep related content Headspace offers. Below is a short description of each, select whichever one of the options on the sleep screen you would like to try.

2. Sleepcasts are bedtime stories for adults. They include a short relaxation at the beginning and last for about 45 minutes.
3. Wind downs are short, sleep-focused mindfulness exercises which last for between 3-10 minutes each.
4. Night-time SOS's are short, guided relaxation exercises designed to help with specific sleep problems, lasting 10 minutes each.

5. Sleep music and sleep sounds are non-guided sound tracks designed to help you relax.
6. Sleep-radio is a continuous playlist which lasts for 8 hours. It is comprised of all the different sleep aids described above.




1st Questionnaire
1
Start using the app
You have 40 days to use the sleep aids 30 times
2
2nd Questionnaire
40 days from now – April
3
3rd Questionnaire
3 months later - July
4
You are here!

[redacted]

Appendix M

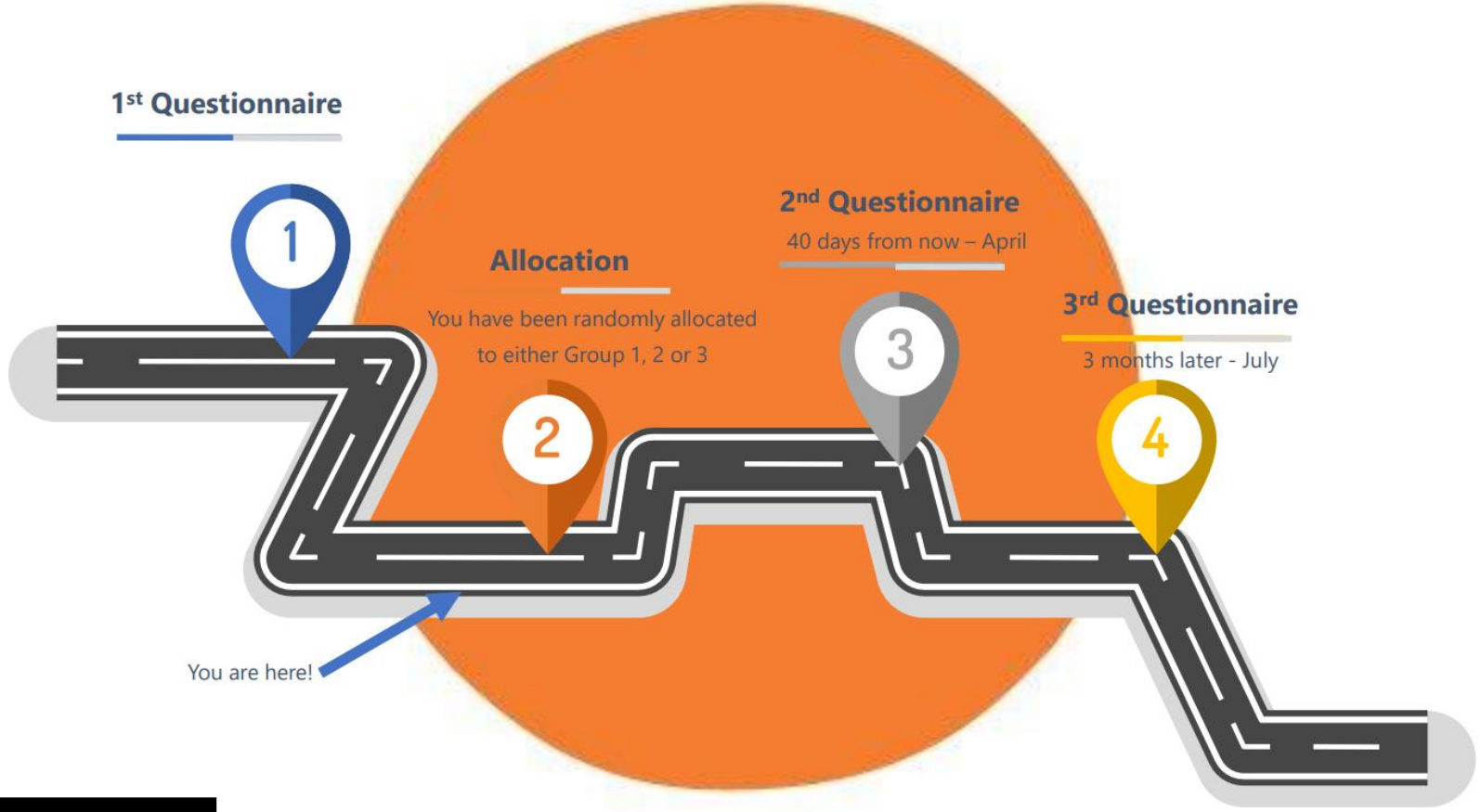
Project 3: Waitlist Control Group App Access Instructions and Road Map

Headspace for Parents Study Instruction Sheet

We'd like you to wait before using the app. In 40 days time, we will send you the second questionnaire, and then three months later we will send you the final questionnaire. After you've completed the last one, we will give you access to the Headspace app.

Whilst you are waiting to get access to Headspace, please DO NOT access the app in any other way, and please DO NOT use any other meditation app.

Once we've given you access to Headspace, the study will be over and you will be free to explore any section of it. We will send you instructions on how to download it and where you might want to start exploring when you've completed the final questionnaire.


1st Questionnaire
1
Allocation
You have been randomly allocated
to either Group 1, 2 or 3
2
2nd Questionnaire
40 days from now – April
3
3rd Questionnaire
3 months later - July
4
You are here!

[redacted]

Appendix N

Debriefing Information

Thank you for taking part in this research study, we hope that you enjoyed using the *Headspace* app.

For some parents, when they are stressed, low in mood, anxious or depressed, they may be more likely to use more negative parenting styles, which can, in turn, have an impact on children's wellbeing.

Mindfulness – defined as paying non-judgemental attention to your present experience – has been shown to reduce stress and improve mental health symptoms, and can increase self-compassion, as well as the ability to regulate emotions.

In this study, by having parents engage in daily mindfulness meditation, we aimed to improve their ability to cope with stress and therefore be more positive in their parenting, improving parent-child relationships and children's wellbeing.

However, we understand that some people may not find mindfulness meditation to be helpful, and that some of the questions you have been asked as part of this study may have been sensitive for you. If you have experienced any distress from taking part, please do not hesitate to contact a member of the research team using the details below. Or, if you would like additional support, please see the following organisations who may be able to help.

Primary researcher: Abigail Burgess,

Supervisor:

Family Action – Provides practical, emotional and financial support to those who are disadvantaged, socially isolated, or living in poverty, across the UK: https://www.family-action.org.uk/

The Samaritans - A free, confidential helpline and email address where you can talk to someone about anything big or small, 24 hours a day, 7 days a week: https://www.samaritans.org/

Mind – Advice and support to anyone experiencing a mental health problem: https://www.mind.org.uk/

Young Minds – A helpline for parents who are worried about their children's mental health: https://youngminds.org.uk/

Place2be – Provides resources to parents support the wellbeing and mental health of their children: https://www.place2be.org.uk/

Appendix O

Systematic literature search and narrative synthesis of mindfulness-based interventions delivered to parents during COVID-19

1.1 COVID-19 context

As previously discussed, the research comprising this thesis started in October 2019, and the restrictions resulting from the COVID-19 pandemic came into force in the UK five months later in March 2020 (Institute for Government, 2022). This means that Project 1 (reported here in Chapter 3) was completed prior to this world-changing event, and the literature included in the meta-analysis does not take account of the effects of the pandemic on family life, or intervention delivery. The qualitative report published from the data collected in Project 2 and discussed in the previous chapter gave some insight into these issues. The current chapter therefore aims to incorporate the published data from Project 2 with other similar studies conducted during the social restrictions of the pandemic to update the meta-analysis findings with a narrative synthesis.

The literature review and meta-analysis described in Chapter 3 demonstrated that MBIs delivered to parents are moderately effective at reducing parental stress (g = 0.36), and have small effects for improving children's outcomes (g = 0.15). However, the qualitative results of Project 2 testing a self-directed MBI with parents during social restrictions demonstrated that COVID-19 has had significant negative effects on parental stress and family functioning (Burgess et al., 2022). COVID-19 also resulted in significant changes to the research process from study design to data collection and analysis (Tuttle, 2020). Therefore, it may be of use to contextualise the results of this thesis, as well as to understand the effects of the pandemic on the theoretical model proposed in Chapter 1, by synthesising the literature which has investigated the effects of mindfulness delivered to parents during COVID-19 restrictions.

1.2 Abstract

Harsh parenting practices are thought to be more frequently employed by parents experiencing more stress. The negative reactions inherent to harsh parenting (e.g., shouting, criticism) have been linked to children's adjustment problems. In a pre-pandemic literature review and meta-analysis, mindfulness-based interventions (MBIs) have been demonstrated to improve parent perceptions of stress and reduce externalising problems for children. However, the COVID-19 pandemic resulted in significant, wide-ranging, social, economic, and psychological adjustments for families during and after lockdowns which may be theorised to have impacted on the delivery of, and effects of, MBIs for parents. This literature review and narrative synthesis therefore updates the review in Chapter 3 by examining MBIs delivered to parents during the pandemic for the purposes of improving their own and/or their children's wellbeing. The databases PsychInfo, Medline, Pubmed, CINAHL, Web of Science, and the Cochrane Central Register of Controlled Trials were searched for studies that delivered MBIs to parents, or parents and children, targeting parental stress and/or children's adjustment outcomes. Of the 26 eligible studies found, four were synthesised. In all four studies, digital MBIs were found to be both acceptable and feasible for participants, although some issues were consistently reported around scheduling daily practice. Of the studies that reported wellbeing outcomes, mindfulness was found to improve parents' stress, reduce their psychopathology and improve their sleep. Limited data was available for children's outcomes. All three studies reported some difficulties related to study recrutiment, retention, or participant experience as a result of COVID-19 restrictions. Differences were noted in the age range of children included, as well as study reporting of home practice in comparison to the pre-pandemic review. These findings may help contextualise the research conducted in this thesis, and demonstrate promise for the feasiblity, acceptability, and utility of digital MBIs for parents during and after the pandemic.

1.3 Introduction

Mindfulness has been demonstrated to improve parenting stress, however, the majority of research investigating MBIs was conducted in-person prior to the pandemic. COVID-19 social restrictions required a lot of psychological research to pivot at short notice to remote delivery methods (Tuttle, 2020), including studies delivering MBIs. Although the review in Chapter 3 was underpowered to detect differences in effects between in-person and digital interventions, other reviews have demonstrated that remote interventions can be equally as effective (Taylor et al., 2021). Given the novelty of COVID-19 restrictions, as well as the relative novelty of digital MBIs in the parenting literature pre-pandemic, a literature search and narrative synthesis has been conducted here to scope the field of knowledge thus far and contextualise the results of this thesis.

1.3.1 COVID-19 and wellbeing

The effects of COVID-19 on individual's mental and physical health, as well as the way in which societies function has proven to be long-lasting, and unpredictable. The British Academy has described the current era as the "COVID decade", highlighting the projected longevity of the social, economic, and cultural effects that have already been seen as a result of the pandemic (The British Academy, 2021). Not only did the pandemic bring about public health measures (lockdowns) which have been shown to increase loneliness (Bu et al., 2020; Killgore et al., 2020), social isolation (Ingram et al., 2021; Mckeown et al., 2021) and psychological distress (Fancourt et al., 2022), as well as increasing the risks of domestic violence and child maltreatment (Rodriguez et al., 2021), but the long term impacts COVID-19 has had on the economy and society have resulted in increased inequality (The British

Academy, 2021), and—crucially for a thesis investigating an app-based intervention—exposed key flaws in digital infrastructure and a worrying digital divide (Baker et al., 2020).

The COVID-19 social study, a large (N = 70, 000), longitudinal study investigating the impacts of COVID-19 on people's daily lives from March 2020 until April 2022, found that not only did participants mental health worsen as the initial stages of the pandemic progressed, but that there were strong associations between the severity of restrictions in place and participants mental health (Fancourt et al., 2022). This study also found that whilst most people gradually adjusted to the stress of the pandemic, some groups were more vulnerable to sustained issues with their mental health, including young people, women, and those living with children (Fancourt et al., 2022). This is arguably particularly pertinent for the research in this thesis, and for the aims of this chapter in particular as the majority of the literature investigating the effects of MBIs is conducted with women living with children. If this group of people is more at risk of sustained negative impacts from social restrictions, then they may be a particularly worthwhile target for wellness interventions like mindfulness.

1.3.2 COVID-19 and parenting

There are a vast range of reasons why parents in particular may have struggled more than most during the pandemic, and within this population even more so depending on their SES (Fancourt et al., 2022). During the initial lockdowns, parents may have found themselves working and providing childcare to younger children whilst simultaneously facilitating remote learning for older children (Adams et al., 2021). Data from the Office for National Statistics (ONS) suggests that the trend for home working has been sustained after social restrictions officially ended in the UK (ONS, 2022a). And whilst this in itself may conceivably reduce the demands on parents' time while their children are at school (e.g., reductions in commuting,

more time for household chore/leisure time, more opportunity for flexible hours worked at home) (Ellison et al., 2009), homeworking is not experienced as a good thing by all parents (Feng & Savani, 2020). In particular, women reported lower work productivity and job satisfaction than men when working from home after the pandemic in a US sample of 286 full-time employees (Feng & Savani, 2020). In the UK specifically, research conducted by the University of Kent and the University of Birmingham found that two thirds of the employees surveyed about their change in working circumstances reported a blurring of boundaries, a lack of appropriate equipment and space, and missing interactions with colleagues as the key negative effects of home working (Chung et al., 2020). The blurring of boundaries may be seen to pre-date COVID-19—and therefore be theorised to have continued after COVID-19 restrictions ceased—as a review of homeworking in fathers over a decade ago highlights, finding that the blurred boundaries between home and work often caused disruptions to fathering practices (Halford, 2006).

Adding to the potential pitfalls of homeworking, is the context that although children had largely returned to school and childcare full time in 2021 (ONS, 2022b), thereby reducing the amount of home-schooling parents were expected to facilitate, schools continued to be the epicentre of infections, in part due to minimal ventilation and an inability to space children out (Williams et al., 2022). This is important not only because of the increased number of sick days children have had to take compared to pre-pandemic absences (Long & Danechi, 2023), but also because a systematic review of risks and protective factors from data collected during the pandemic suggests that people who experience concerns about repeated re-infection (e.g., parents from their children attending school) are at greater risk of poorer mental health outcomes (Kunzler et al., 2021). There has also been a resurgence in some parts of the world of vaccine preventable infections (such as measles) due to immunisation gaps as

a result of COVID-19, with more than 60 national vaccine programs having been disrupted or suspended due to lockdowns in the United States (Feldman et al., 2021). A national matched cohort study in the UK also suggests that as many as one in seven children continue to have COVID-19 symptoms up to 15 weeks after the initial infection (Stephenson et al., 2021), meaning there is the potential of a long-COVID rate of 14% in children (Wise, 2021). This presents a serious disease burden, increasing both physiological and psychological stress for both children and their parents.

1.3.3 COVID-19 and mindfulness

Despite these challenges, however, there is some evidence of protective factors against the increased stresses brought on by the pandemic. For example, in the UK, it has been demonstrated that people who spent more time outdoors, had access to green space, who continued to communicate with family and friends, and who exercised or pursued creative hobbies experienced greater improvements in mental health during the initial social restrictions than people who engaged in more harmful coping strategies (Fancourt et al., 2022). Neighbourhood support and engagement in community groups has also been demonstrated to be a protective factor for a range of disasters, including the pandemic (Newnham et al., 2022). Another meta-analysis highlighted the importance of both systemic protective factors (timely and accurate information from authorities about COVID-19, and the ability to engage with recommended precautionary measures, e.g., social distancing), as well as individual factors (including using positive coping strategies, having a secure attachment style, and prioritising socialising and rest) to reduce symptoms of mental illness as a result of lockdowns (Xiong et al., 2020). More broadly, risk perception, distress tolerance, and health

anxiety have been correlated with increased anxiety as a result of COVID-19, all of which are susceptible to cognitive intervention (Lindner et al., 2022).

One potential avenue of cognitive intervention which has shown promise in studies conducted during the pandemic is mindfulness. Higher levels of dispositional mindfulness have been shown to predict lower levels of anxiety and depression in a cross-sectional sample of American and European adults collected during COVID-19 restrictions (Dailey et al., 2023). More specifically in adolescents, when comparing results during the pandemic to pre-pandemic levels, for every one unit increase in the non-judgemental acceptance of self, participants were 31% less likely to experience greater rather than unchanged or lower stress, as well as experiencing 2.76 times better mental health, and (controlling for quality-of-life pre-pandemic), were 58% more likely to report at least as good quality of life as pre-pandemic (Kock et al., 2021). In adults, higher trait mindfulness has been associated with less worry about COVID-19, lower pandemic stress and more use of positive coping strategies (Dillard & Meier, 2021). Little research has been conducted with parents specifically, however, in a cross-sectional Portuguese sample, lower levels of the mindfulness dimensions listening with full attention, self-regulation, and compassion for the child, were associated with more impaired mother-infant bonding for children born during the pandemic (Fernandes et al., 2021).

1.3.4 COVID-19 and research

The first cases of COVID-19 were identified in Wuhan, China, and reported to global authorities on 31st December 2019 (UKHSA, 2020)—only three months later, by 25th April 2020, a bibliometric analysis of the database Scopus found 3, 513 scientific articles about COVID-19 had already been published (Hamidah et al., 2020). This figure had ballooned to

210, 183 papers just over a year later by August 2021 (Ioannidis et al., 2021). Despite the numerous published studies variously investigating the causes, treatments, and impacts of COVID-19, and the rallying of the global scientific community to fast-track COVID-19 research to find cures, develop vaccines, and improve people's experiences of living during the pandemic, COVID-19 has had serious impacts on the research process (Tuttle, 2020). Beginning at study design and impacting all aspects of research through data collection and analysis, COVID-19 has presented both barriers and facilitators to clinical research in particular (Bratan et al., 2021). For example, prior to the pandemic, only 2% of all biomedical research was focused on virology (including influenza), however, by October 2020, this was estimated to have risen to between 10-20% (Valencise et al., 2022). This demonstrates the speed with which research can be adaptable when given appropriate funding. As a result of previous work to improve vaccine development, the Oxford Vaccine Trial in the UK was fast-tracked to human testing at an unprecedented pace—an article advertising recruitment for the ChAdOx1 nCoV-19 vaccine was posted on the Oxford University website on 27th March 2020 (University of Oxford, 2020).

Although these examples demonstrate the re-direction of funds and resources to biomedical research to find treatments for COVID-19, the pandemic has also facilitated the integration of digital methods for clinical research where previously participants may have been recruited and screened in-person, as a result of the unique incentives social distancing provided to translate research online (Park et al., 2021; Richardson et al., 2021). However, and perhaps importantly for this thesis, the negative effects of resource reallocation and the need to either pause projects or pivot to online delivery is known to have had a particularly negative impact on the experiences of students and early career researchers (Douglas et al., 2022).

1.3.5 The current study

Given the unique and ubiquitous impacts of COVID-19 on the social, cultural, and research environment that this thesis was produced in, it may be of use to update the literature review and meta-analysis completed pre-pandemic in Chapter 3, with one investigating MBIs delivered during the pandemic. This is intended to contextualise the research that was conducted for this thesis and to provide an opportunity to compare the effects of MBIs delivered during the pandemic to pre-pandemic findings, as well as the feasibility and acceptability of the novel delivery methods post-pandemic (all remote), and the COVID-19 experiences for families/on the research process, where reported. However, given the novelty of digital MBIs more broadly, as well as the relatively recent onset of the pandemic, the literature was limited. As such, a systematic literature review and narrative synthesis (as opposed to a meta-analysis) has been conducted in order to answer the research question, what effects did COVID-19 have on the delivery of MBIs to parents, intended to improve parent and/or child outcomes?

1.4 Methods

1.4.1 Search

To determine the effects of MBIs for parents and/or children since the start of the COVID-19 pandemic (March 2020—Institute for Government, 2022), a search strategy adapted from that used in Chapter 3 (investigating the pre-pandemic literature) was used and is shown in Table 1.1. An additional key term, “COVID-19” was added to the existing two, “Mindfulness” and “Parenting”.

Table 1.1

Key search terms

Key term	Keyword search terms	Subject heading search terms
Mindfulness	Mindful*	Mindfulness
	Meditat*	Meditation
	Mindful parent*	
	Dispositional mindfulness	
	Trait mindfulness	
Parenting	Parent*	Parenting
	Mother*	Parents
	Father*	Parenting style
	Maternal	Parenting skills
	Paternal	Parental attitudes
		Parenting behaviour
		Parent training
		Parent-child relations
		Mother-child relations
		Father-child relations
COVID-19	COVID	COVID
	COVID-19	COVID-19
	Corona*	Coronavirus
	Pandemic*	Pandemic

1.4.2 Eligibility criteria

Studies of any design were included if they described the effects of delivering mindfulness-based interventions during the pandemic to either parents only or to parents and children in parallel, measuring effects for parent and/or child outcomes related to wellbeing. Mindfulness interventions were defined as comprising more than one session, incorporating at least 50% mindfulness content, and referencing further independent practice. To maintain relevance to the two studies conducted during COVID-19 for this thesis (Projects 2 and 3), studies that exclusively delivered interventions to children were excluded, as were studies that did not measure any parent outcomes. No limitation was placed on country of origin, but only papers written in English were included as there was no scope for translation. Due to the relative novelty of COVID-19 research at the time of searching (August 2022 and January 2023), results were not restricted to published research only, but also included unpublished doctoral theses.

1.4.3 Information sources and search

The electronic databases PsychInfo, Medline, Pubmed, CINAHL, Web of Science, and the Cochrane Central Register of Controlled Trials were searched in August 2022, and again in January 2023. No new studies were found. Using the same strategy as detailed in Chapter 3, the three key terms (and all of their variations) in Table 5.1 were combined using the Boolean operator OR, and then combined with the Boolean operator AND.

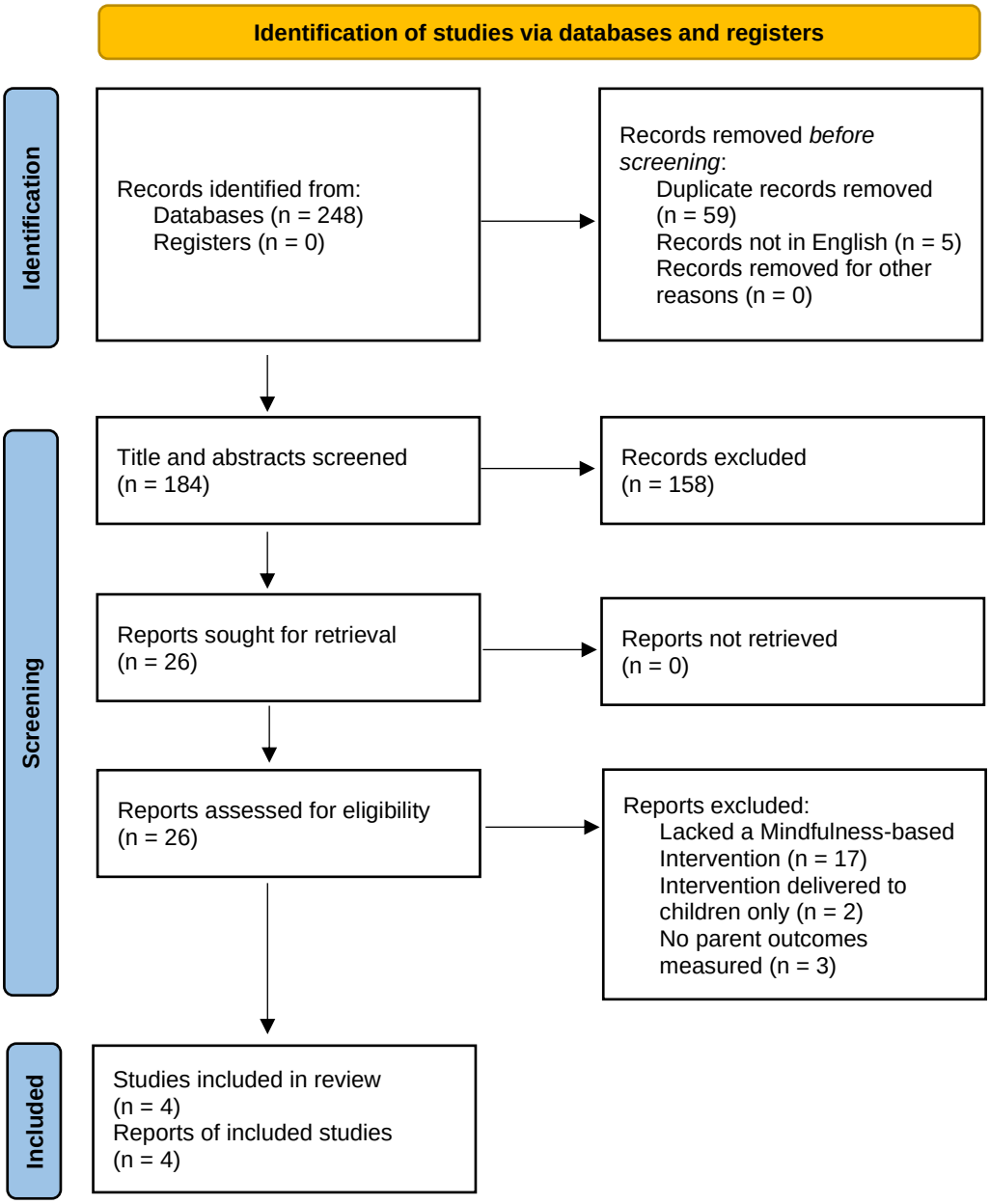
1.4.4 Study selection

Following the removal of duplicates, title and abstract screening resulted in 26 studies included in a full-text review. Of these, 17 were excluded for lacking an intervention, two due

to the intervention being delivered only to children, and a further three as no parent outcomes were measured. Thus, four intervention studies were included in the narrative synthesis; Figure 1.1 presents a flow chart of the selection process.

Figure 1.1

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers



Adapted from: Page et al. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. International journal of surgery, 88, 105906.

1.4.5 Risk of bias

Risk of bias assessments were conducted using the Cochrane Risk of Bias in Non-randomised Studies—of Interventions (ROBINS-I) tool (Sterne et al., 2016). All domains were assessed, but due to the preliminary nature of the research and to reserve sample size, studies at critical risk of bias (N = 4) were not excluded (see Table 1.2).

Table 1.2

Risk of bias assessments using the RoBINS-I Tool

Included studies	**Overall risk of bias** (critical risk domain)
Burgess et al. (2022)	Critical (confounding; measurement of outcomes; selection of reported results)
Maher (2021)	Critical (confounding; measurement of outcomes)
Safer-Lichtenstein (2022)	Critical (confounding; measurement of outcomes; selection of reported results)
Wisen-Vincent & Bokoch (2023)	Critical (confounding; measurement of outcomes; selection of reported results)

1.4.6 Data extraction and analytic strategy

Quantitative data extracted included the number of participants, participant characteristics (gender, age, child age), study design, study location and intervention details (see Table 1.3), as well as some measures of feasibility, acceptability, and effects. Qualitative data extracted included participant reports of feasibility, acceptability, and intervention effects, as well as details regarding intervention adaption and COVID-19 impact. Where data were missing, study authors were contacted for additional details, however, if no reply was received the study was not excluded due to the very small number of eligible studies, and the narrative nature of the synthesis.

The results of the four eligible studies were narratively synthesised due to the small, pre-post mixed-method designs, according to Synthesis Without Meta-analysis (SWiM) guidelines (Campbell et al., 2020). Because all included studies used very similar methods to test an intervention which shared key aspects (i.e., mindfulness content, via remote delivery), for parents of children of similar ages, the narrative synthesis has been grouped according to the outcomes of interest for this review, namely; the feasibility and acceptability of digital MBIs, the effects of digital MBIs on parent and child outcomes, and the impact of COVID-19 on both participant experience and the research process. The effects of the MBIs as reported in the studies are reproduced narratively here—no standardised metrics or transformation methods have been used due to the very small samples in the individual studies, and the very small number of included studies with few comparable measures.

1.5 Results

1.5.1 Study characteristics

Of the four studies found to have delivered an MBI to parents during the COVID-19 pandemic, only two were part of an established intervention framework (MBSR; Safer-Lichtenstein, 2022; and the Neuro-Filial Parenting Programme; Wisen-Vincent & Bokoch, 2023). One intervention was developed specifically for the population of interest, post-partum women, with input from clinicians and parents (Maher, 2021), and one was the *Headspace* app, as reported in this thesis (Burgess et al., 2022). All four interventions were delivered to parents only, half (n = 2) were delivered in a group format (Safer-Lichtenstein, 2022; Wisen-Vincent & Bokoch, 2023), one was entirely self-directed (Burgess et al., 2022), and one incorporated an initial group session followed by self-directed audio sessions (Maher, 2021).

The group interventions were delivered over 6 weeks for either 1.5 (Safer-Lichtenstein, 2022) or 2 hours (Wisen-Vincent & Bokoch, 2023). For the individual interventions, duration of daily practice ranged from 3-10 minutes once (Burgess et al., 2022) or 3-13 minutes twice a day (Maher, 2021). Only one of the four studies did not require any intervention modification to deliver it remotely (the *Headspace* app; Burgess et al., 2022), the other three studies replaced in-person sessions with synchronous online meetings. Unsurprisingly, there was higher utilisation of remote delivery methods for MBIs delivered during the pandemic in comparison to the studies included in Chapter 3, and, correspondingly, better recording of home practice requirements. Here, three of the four studies (75%) explicitly stated these requirements, in comparison to only 32% (7 out of 22) pre-pandemic.

A total of 101 parents participated in the included studies, of whom the overwhelming majority were women (ranging from 92% to 100%, M = 98%) and married or cohabiting (where reported, ranging from 92% to 100%, M = 97%). Whilst slightly more diverse, the majority of mothers were White (ranging from 55% to 100%, M = 78%), except for one study (Safer-Lichtenstein, 2022) where Hispanic Americans were specifically targeted for the intervention. The mean age of parents (where reported) was 38.4 years (ranging from 33 to 42 years). The demographic details of parents in these studies are similar to those included in the meta-analysis in Chapter 3, however, the age of the participants' children was much more homogenous than those of studies conducted prior to the pandemic, and focused on pre-school or primary-school aged children (ranging from 1 to 10 years old). There was also only one study here that explicitly focused on parents of children with a neurodevelopmental disorder (Wisen-Vincent & Bokoch, 2023). For more details, see Table 1.3.

Table 1.3

Summary of included study and participant characteristics

Authors	Study design	Study location	Intervention (length)	Target	Modification to intervention for COVID-19	Participant N	Age M (SD)	Female N (%)	Ethnicity – White N (%)	Married or Cohabiting N (%)	Child age M (SD)
Burgess et al. (2022)	Mixed methods pilot pre-post one group	United Kingdom	*Headspace* app (3-10 mins daily for 30 days)	Parents of 2–5-year-olds	N/a	12	42 (3.58)	11 (92%)	12 (100%)	11 (92%)	3.5 years (1.08)
Maher (2021)	Mixed methods pilot pre-post one group	Massachusetts, USA	Semi-guided mindfulness training program developed for postpartum women (3-13 mins twice daily)	6-week to 6-month post-partum mothers	Video session replaced in-person session (otherwise, audio guided)	18	33.94 (3.75)	18 (100%)	14 (78%)	18 (100%)	11 weeks
Safer-Lichtenstein (2022)	Mixed Methods Pilot Study	English and Spanish-Speaking Hispanic Americans	MBSR (6 weekly 2-hour sessions + 30-45 min daily home practice) + Behavioural Parent Training; Psychoeducation + Behavioural Parent Training;	Primary caregivers of 3–5-year-olds with intellectual and develop-mental disabilities	Four weeks after starting intervention, in-person meetings moved to synchronous Zoom meeting	60	39.33 (8.00)	59 (98%)	0%	Not reported	3.88 (.80)
Wisen-Vincent & Bokoch (2023)	Mixed Methods pretest-posttest one group	English-speaking Americans	Neuro-Filial Parenting Program (6 weekly 1.5-hour sessions + home practice)	Parents of 4–10-year-olds	Remote, synchronous group meetings	11	39.27	11 (100%)	6 (54.5%)	11 (100%)	1-10 years

1.5.2 Feasibility and acceptability of remote MBIs

All four studies reported on feasibility and acceptability measures qualitatively, and one study also included a quantitative measure of acceptability and satisfaction (Maher, 2021). In all four studies, participants reported the intervention to be acceptable and useful, however, in three studies there were comparable issues reported with feasibility (Burgess et al.; Maher, 2021; Safer-Lichtenstein, 2022). These issues may be summarised as parents struggling to fit daily home practice into their schedules, with one study in particular highlighting that parents found applied practice (i.e., mindfully feeding their child, or mindfully walking) more feasible than intentional seated practice (Maher, 2021).

1.5.3 Effects of digital MBIs on parental stress and child outcomes

The studies included various measures of different aspects of parental and/or child wellbeing, including both qualitative and quantitative measures of effect. Of the four studies, one examined the effects of mindfulness on parent outcomes only (Maher, 2021), whilst the rest looked at both parent and child outcomes (although one did not report these results—Safer-Lichtenstein, 2022; and one reported them qualitatively only—Burgess et al., 2022).

In terms of parent outcomes, all studies reported some improvements in the different aspects measured, and whilst difficult to synthesis due to heterogeneity, two of the studies reported increases in mindfulness specifically (Maher, 2021; Wisen-Vincent & Bokoch, 2023). One reported reductions in anxiety (Maher, 2021), one reported reductions in stress (Burgess et al., 2022), and one reported improvements in social support as a protective factor (Wisen-Vincent & Bokoch, 2023).

In terms of children's outcomes, only one study explicitly reported effects whereby improvements were seen in children's interactions with peers (Wisen-Vincent & Bokoch, 2023). Of note, this study was also the only one synthesised to include school aged children. The outcome measures used, and the results reported, can be seen in detail in Table 1.4.

1.5.4 Impact of COVID-19 on participant experience and research processes

Only one study explicitly reported on the effects of COVID-19 on parents' experiences more broadly during lockdowns (Burgess et al., 2022), however, all four studies reported similar themes relating to the effects of COVID-19 on parents' experiences of mindfulness. Some parents in all four studies reported wanting the connection of in-person interactions, and two in particular highlighted the impacts of the loss of social connection and increased anxiety that the MBI helped some parents to cope with (Burgess et al., 2022; Maher, 2021). Three studies noted difficulties with parent engagement due to pandemic-related time pressures and changes in childcare arrangements (Burgess et al., 2022; Maher, 2021; Safer-Lichtenstein, 2022). In two studies, some parents expressly appreciated the accessibility of remote sessions as preferable to in-person attendance for an MBI (Burgess et al., 2022; Wisen-Vincent & Bokoch, 2023). Three of the four studies reported themes of COVID-19 impacting participant engagement with the intervention (Burgess et al., 2022; Maher, 2021; Safer-Lichtenstein, 2022), and two of these studies reported subsequent issues with data analysis diverging from pre-pandemic plans as a result of either the impact of COVID-19 on families (Burgess et al., 2022), or recruitment and retention issues (Maher, 2021).

Table 1.4

Summary of results per narrative synthesis theme

Study	Outcomes measured	Summary of results
Burgess et al. (2022)	*Feasibility and Acceptability* App-usage data; Semi-structured interview	*Feasibility and Acceptability* Parents reported finding the app acceptable and broadly feasible, if sometimes challenging to fit into daily routines
	Effects on Parent and Child Wellbeing Semi-structured interview; FMSS transcripts (thematically analysed)	*Effects on Wellbeing* Self-reported reductions in stress and improvements in sleep.
	COVID-19 Semi-structured interview; FMSS transcripts (thematically analysed)	*COVID-19* Positive effects reported of more time with children and a slower pace of life, negative effects reported for parents' experience of child behaviours, and increased parental stress related to work and childcare arrangements. Some reported the intervention to be useful for problems worsened by the pandemic (i.e., struggling with child behaviours), others reported it would have been more useful pre-pandemic.
Maher (2021)	*Feasibility and Acceptability* Mindfulness practice frequency (email questionnaire); Acceptability and Satisfaction (open-ended questionnaire)	*Feasibility and Acceptability* On a five-point scale where 1 is very difficult and 5 is very easy, participants rated daily practice as 2.56 (moderately difficult), finding applied practice easier than intentional seated practice. All participants found mindfulness acceptable, and 67% would recommend to a friend.

	Effects on Parental Wellbeing Mindfulness (FFMQ); Anxiety (GAD-7); Depression (EPDS); Post-partum Anxiety (PSAS); Parental Self-Efficacy (KPCS)	*Effects on Parental Wellbeing* A medium effect (*g* = .50) for reduced postpartum specific anxiety from pre- to post-measures (*t* = 3.23, p = .005), a large effect (*g* = .88) for increased parental self-efficacy (*t* = -4.30, p < .001), and a medium effect (*g* = .61) for increased mindfulness (*t* = -2.38, p =.03). No changes in depression.
	COVID-19 Impact of COVID-19 (open-ended questionnaire)	*COVID-19* Reported impacts on loss of social connection and increased anxiety. Harder to engage with the intervention because of pandemic-related demands on time and difficulties with scheduling, but equally that it helped parents cope with pandemic-related distress
Safer-Lichtenstein (2022)	*Feasibility and Acceptability* Group attendance; Focus Groups; Parent Satisfaction Questionnaire	*Feasibility and Acceptability* Preferred Psychoeducation over MBSR; difficulties implementing strategies outside of sessions, appreciated sense of community and learning from other parents
	Effects on Parent and Child Wellbeing Parenting Stress (PSI-SF); Child Problem Behaviours (CBCL)	*Effects on Parent and Child Wellbeing* NR
	COVID-19 Focus Groups	*COVID-19* Some issues reported with engagement—parents found in-person connections more meaningful and found having to do childcare during the sessions challenging

Wisen-Vincent & Bokoch (2023)	*Feasibility and Acceptability* Program Evaluation (closed and open-ended questionnaire)	*Feasibility and Acceptability* Almost universally reported as acceptable, and feasible due to there being no travel requirements
	Effects on Parent and Child Wellbeing Mindfulness (MIPQ); Child Behaviour (SDQ); Parent-Child Relationship (CPRS); Protective Factors Survey (PFS); Program Evaluation (closed and open-ended questionnaire)	*Effects on Parent and Child Wellbeing* Increases from pre- to post- in Mindful discipline (Z = -2.20, p = .014) and social support as a protective factor (Z = -1.73, p = .042), as well as improvements in child interactions with peers (Z = -1.64, p = .051)
	COVID-19 Program Evaluation (open-ended questionnaire)	*COVID-19* Most parents appreciated the accessibility of remote sessions, but some felt the connections with other parents during groups would have been better in-person than over Zoom

Notes: FMSS = Five-Minute Speech Sample; FFMQ = Five Facet Mindfulness Questionnaire; GAD-7 = Generalised Anxiety Disorder Assessment; EPDS = Edinburgh Post-natal Depression Scale; PSAS = Postpartum Specific Anxiety Scale; KPCS = Karitane Parenting Confidence Scale; PSI-SF = Parental Stress Index – Short Form; NR = Not reported; CBCL = Child Behaviour Checklist; MIPQ = Mindfulness in Parenting Questionnaire; SDQ = Strengths and Difficulties Questionnaire; CPRS = Child-Parent Relationship Scale; PFS = Protective Factors Survey

1.6 Discussion

This literature review and narrative synthesis aimed to update the findings from the literature review and meta-analysis in Chapter 3 to account for the context of delivering MBIs to parents during the COVID-19 pandemic. It was found that mindfulness delivered remotely was both acceptable and feasible for parents in the included studies, although they commonly reported difficulties with scheduling daily home practice. In terms of effects, previously, moderate effects (g = 0.36) were found for reducing parental stress, and small effects for improving children's outcomes (g = 0.15). Here, it was found that mindfulness improved the outcomes of either parents or parents and children in the three studies where this was reported (Burgess et al., 2022; Maher, 2021; Wisen-Vincent & Bokoch, 2023). Although parental outcomes were too diverse to meaningfully synthesise as one outcome, improvements included increased mindfulness, reductions in stress, better sleep, reductions in anxiety, and improvements in social support as a protective factor. Only one study reported children's outcomes, whereby children's interactions with peers were also improved. In terms of pandemic effects, this synthesis suggests that parents experienced increased isolation and difficulties with study engagement, although there were some reports of mindfulness improving pandemic-related distress.

1.6.1 Feasibility and acceptability of remote MBIs during COVID-19

Although there were only a few studies conducted using MBIs during the pandemic, it is promising that this intervention format proved to be adaptable to remote delivery in a variety of contexts, and further that mindfulness seemed to remain effective at improving the outcomes measured in the three studies where outcomes were reported. However, caution is warranted interpreting these results due to the small pilot study designs implemented.

Whilst small pilot trials are often the first step in intervention testing, described in the NIH framework for behavioural intervention research as stage I—preliminary testing—it is important to note that the NIH specifically states that the use of pilot testing for demonstrating efficacies of interventions is a potential misuse of study design (NIH, 2023). Pilot studies are, however, useful and appropriate methods to determine feasibility and acceptability of interventions for which there is limited knowledge about the best methods to implement them, for example, remote MBIs during COVID-19. As such, it is particularly promising that all four studies demonstrated the feasibility and acceptability of the interventions tested.

Although largely feasible and acceptable, two of the studies reported that parents preferred in-person connections to those developed online (Safer-Lichtenstein, 2022; Wisen-Vincent & Bokoch, 2023). Despite this, in the one study which compared a mindfulness intervention with a group parenting intervention (Safer-Lichtenstein, 2022), parents reported finding the most useful elements of the programme to be making connections with other parents in the remote group sessions. This may have implications for self-directed interventions which do not foster community between parents as it is a largely individual endeavour. Perhaps, therefore, the unique utility of app-based MBIs is that whilst self-directed at the individual level, there is scope for shared group practice, for example, *Headspace* hosts group meditations daily at 30-minute intervals that all app subscribers can join in with (*Headspace* Inc., 2023*)*.

1.6.2 COVID-19 and family life

For the purposes of this thesis, it is also significant to note the similar experiences reported by parents living with their children through lockdowns. More broadly in the general

population, lockdowns have been demonstrated to decrease wellbeing (Bu et al., 2020; Killgore et al., 2020), however, perhaps this is a slightly more pressing issue for parents who were also deprived of their usual childcare methods with little relief from their working schedules (Weaver & Swank, 2021). This is important because of its potential consequences on parental stress, relationships between parents and children, and therefore, some key elements in the proposed model of mindfulness in parenting being tested here. The fact that in two of the studies, the mindfulness home-practice participants engaged in as part of the study was reported as helping them to deal with their pandemic-related distress (Burgess et al., 2022; Maher, 2021) is promising for the adaptability of MBIs to different social and cultural contexts, as argued by advocates long before COVID-19 became a relevant contextual factor (Kabat-Zinn, 2003).

1.6.3 COVID-19, mindfulness, and research

Whilst digital MBIs delivered remotely to participants, often in a self-directed manner, were tested prior to the pandemic, and all MBIs incorporate some element of home practice by definition, it is significant to note the changes in reporting of home practice evident between this literature review and that contained in Chapter 3. In the pre-pandemic meta-analysis, only 32% of studies reported the amount of home practice participants were expected to complete as part of the intervention, however, during the pandemic, this rose to 75%.

Whilst this is perhaps not surprising given that almost the entirety of the interventions delivered during the pandemic were conducted remotely in the participants home, and the vastly smaller number of included studies (N = 4 here, in comparison to N =22 in Chapter 3), it may also speak to a shift in the perspective of the researchers documenting the studies they

conduct. Home practice has long been considered essential for increasing the therapeutic effect of treatment in MBIs. However, a pre-pandemic narrative synthesis of home practice requirements in controlled MBI studies indicated that the measurement of this, and the guidance given to participants about it were variable (Lloyd et al., 2018). The authors of the synthesis suggest this demonstrates deviations from published mindfulness protocols, and advised future research adopt a more standardised approach for monitoring home-practice. Perhaps an unintended consequence of the pandemic may result in this, as more remote interventions are tested for feasibility and acceptability, requiring more explicit home practice guidance.

1.6.4 Strengths and limitations

In addition to the very small, uncontrolled nature of the pilot studies reported in this narrative synthesis, all of the outcomes were operationalised using too heterogenous measures to combine directly. They also variously reported COVID-19 impacts, some incidentally (Wisen-Vincent & Bokoch, 2023), and some more purposefully (Burgess et al., 2022), however, they were all conducted too early in the pandemic for validated COVID-19 impact measures to have been available. In addition to this, one study deviated from standard published protocols by creating a new mindfulness intervention specifically for post-partum women (Maher, 2021), and one used a novel self-directed mindfulness-based app (Burgess et al., 2022) which had not been tested in the parenting domain before. This makes it difficult to compare the literature with that conducted pre-pandemic, which was largely based on either MBCT or MBSR frameworks.

Furthermore, three of the four studies were conducted as part of doctoral research, and two them were unpublished at the time of searching (Maher, 2021; Safer-Lichtenstein, 2022).

An implication for the interpretation of these results being above and beyond the usual critique of incorporating doctoral work in narrative syntheses (e.g., being unpublished), is that they should perhaps be interpreted in light of the negative effects of COVID-19 being felt more impactfully by junior researchers. For example, both of the two studies which expressly reported difficulties in the research process during COVID-19 (e.g., recruitment and retention, or data analysis) were both conducted as part of doctoral research (Burgess et al., 2022; Maher, 2021). However, this study does provide a useful means of comparison pre- and post-the onset of the pandemic, giving a window into the experiences of participants and researchers to greater or lesser degrees during the initial stages of COVID-19 restrictions.

1.6.5 Conclusion and implications

In terms of the work contained within this thesis, this narrative synthesis may be useful to identify the difference in parental experience, as well as research practices in delivering MBIs to parents, that occurred as a result of the pandemic. The qualitative data reported here in Chapter 4 was incorporated in this narrative synthesis from the published paper the work produced, however, quantitative data was also collected. A brief report of this follows in the next chapter as, whilst this did not contribute to the publication incorporated in this synthesis, it did contribute to the planning of Project 3 (an internal pilot RCT).