Moderators and Mediators of Guided Parent-delivered CBT for Child Anxiety

Siyu Zhou
Lincoln College, University of Oxford
Supervisors: Professor Cathy Creswell & Dr. Tessa Reardon

A thesis submitted for the degree of
Doctor of Philosophy
Trinity 2025

Abstract

Anxiety disorders are among the most common mental health problems in children and are associated with significant negative outcomes for individuals, families, and society. Cognitive behaviour therapy (CBT) is the most extensively supported approach for the prevention and treatment of child anxiety disorders; however, traditional modes of CBT delivery are resource-intensive and require a lot of therapist input, limiting access to many children in need. Low-intensity forms of CBT have been developed to increase access, including therapist-guided parent-delivered CBT (GPD-CBT), in which parents work through a self-help book or website with therapist support (in person or remotely) to learn how to use CBT techniques to help their child cope with anxiety-provoking situations. Evidence suggests that GPD-CBT programmes, including those delivered online with remote therapist support, are effective for the prevention and treatment of childhood anxiety disorders. However, little is known about what may influence the outcomes of this approach (moderators) and mechanisms through which it works (mediators). This thesis aimed to expand current understanding of these two questions using a multi-method approach, with the goal of providing insights to optimise the design and delivery of future GPD-CBT programmes to better support children and families with diverse needs.

A meta-analytic review, a quantitative study, and a qualitative study were conducted to investigate moderators of GPD-CBT for child anxiety. The meta-analytic review (Chapter 2) examined the moderating role of a range of sample and intervention characteristics on the effectiveness of CBT for the prevention and treatment of anxiety disorders in children and adolescents reported in randomised controlled trials (RCT). However, only a few RCT studies included in the review focused specifically on GPD-CBT, limiting the generalisability of review findings to this specific approach. A quantitative study (Chapter 3) and a qualitative study (Chapter 4) were then conducted to investigate moderators of an online GPD-CBT programme targeting young children (4-7 years) identified at risk of anxiety disorders evaluated in a RCT study. Findings indicate that the intervention was effective across a wide range of child and parent characteristics. Although some child and parent characteristics were associated with poorer outcomes or engagement, specific intervention components helped parents overcome these challenges (e.g., flexible time scheduling, exercises that can fit in daily routine), and certain process-related factors (e.g., having clear goals, being persistent) enabled more effective implementation of the intervention. Using data from the same RCT

study, a quantitative study (Chapter 5) and a qualitative study (Chapter 6) were also conducted to investigate mediators of GPD-CBT for child anxiety. Findings identified a range of changes in children and parents during the intervention that may help explain its effects in reducing child anxiety symptoms and illustrated how these changes occurred and how they collectively contributed to reductions in child anxiety.

Taken together, the empirical findings of this thesis provide preliminary evidence on the moderators and mechanisms of GPD-CBT for child anxiety. These insights could inform the design and delivery of future GPD-CBT programmes for child anxiety, particularly regarding who may benefit from this approach, key targets, and components of the intervention, and how to support parents to overcome challenges and implement this approach effectively. However, focusing on a specific GPD-CBT programme means it is unclear to what extent these findings can be generalised to other GPD-CBT programmes delivered in different formats and/or targeting different populations. Nevertheless, this thesis indicates promising directions for future research to investigate moderators and mechanisms in more diverse GPD-CBT programmes for child anxiety using a multi-method approach.

Acknowledgements

There is an old Chinese saying: *to grow up, a child must read ten thousand books and travel ten thousand miles.* Since I was eighteen, the ideal of helping others has pulled me away from home time and again in search of knowledge and new experiences. Four years ago, that journey took me farther than ever before, to Oxford. I arrived here alone, like a first-year stepping into Hogwarts for the very first time: speaking hesitant English, not sure whether excitement outweighed nerves, and slowly beginning to take in everything around me.

Over the past four years, I have often felt pride in my progress and frustration at the slow pace of research; joy in the everyday warmth I share with my partner and longing for home during festivals; laughter with friends in the moment and anxiety about an uncertain future. Yet through every one of these moments, whether joyful or difficult, I was never alone.

I owe my deepest gratitude to my supervisors, Professor Cathy Creswell and Dr Tessa Reardon. Every piece of work I have accomplished over the past four years has been shaped by your thoughtful, incisive guidance and feedback. The knowledge, experience, and resources you generously shared were always invaluable, and every discussion with you was inspiring, pushing me to think more deeply and broadly. Thank you for always believing in me, for noticing my progress before I could see it myself, and most of all, for being there with the warmest understanding and the most helpful advice whenever I faced difficulties.

I have also been fortunate to find wonderful friends in Oxford-thank you, Yuzhen, Huilin, En-Nien, Helen, and many others. It is a joy to be surrounded by people who are genuinely passionate about their work and who throw themselves into it wholeheartedly. Watching your eyes light up when you talk about your research has always been both refreshing and inspiring. And even when we don't meet often, just knowing that you are out there, pursuing your dreams, reminds me that I'm not alone.

I am also grateful to have been part of the TOPIC group. I was inspired by the diversity of talent, the wealth of resources, and the supportive, vibrant atmosphere of the team from the very beginning, and I am so proud to be part of the team. I owe particular thanks to the MY-CATS team, this thesis would not have been possible without your hard work. I am also deeply grateful to all the children, parents/carers, and teachers who participated in the MY-

CATS study. Though I did not have the chance to meet you in person, I heard your voices, felt your feelings, and shared in your experiences, all of which are truly invaluable. I would also like to take this opportunity to say Thank You to Professor Lucy Bowes, Professor Frances Gardner, Professor Alexandra Hendry, Professor Samantha Cartwright-Hatton for taking the time to go over my work and provide valuable feedback and guidance at different stages of my DPhil.

Of course, none of this would have been possible without my parents, who know nothing about my work but have always been supportive. Finally, thanks to Binglin for being there with me in every moment as my partner, my family, and my best friend. You are the greatest surprise I have ever encountered in the world, and I cannot wait to start the next chapter of life together with you.

Table of Contents

List of Figures

List of Tables

List of Relevant Publication

Published

Zhou, S., Creswell, C., Košir, U., & Reardon, T. (2025). Moderators of cognitive and behaviour therapies for prevention and treatment of anxiety disorders in children and adolescents: A systematic review and meta-analysis. *Clinical Psychology Review*, 116, Article 102548.

Zhou, S., Creswell, C., Spence, S. H., & Reardon, T. (2024). Measurement invariance of the higher-order model of Preschool Anxiety Scale (PAS) across child age, gender, parental anxiety, and pandemic period in England. *Psychological Assessment*, 36(9), 526–537.

Reardon, T., Ukoumunne, O. C., Dodd, H. F., Halliday, G., Hill, C., Jasper, B., Jones, B., Lawrence, P. J., Morgan, F., Placzek, A., Rapee, R. M., Violato, M., Yu, S., Team, MYCATS, Creswell, C (2024). Parent-led CBT delivered via online and telephone support alongside usual school practice versus usual school practice only for young children identified as at-risk for anxiety disorders through screening in schools: A cluster randomised controlled trial. available at: SSRN: https://ssrn.com/abstract=5027298 or http://dx.doi.org/10.2139/ssrn.5027298

Chapter 1: General Introduction

Childhood anxiety disorders

Anxiety disorders are characterised by excessive and persistent anxiety and worry, together with clinically significant distress or impairment in social, occupational, or other important areas of functioning (American Psychiatric Association, 2013). According to the latest edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association, 2013), there are 11 distinct types of anxiety disorders, including separation anxiety disorder, selective mutism, specific phobia, social anxiety disorder (social phobia), panic disorder, generalised anxiety disorder, agoraphobia, substance/medication-induced anxiety disorder, anxiety disorder due to another medical condition, unspecified anxiety disorder, and other specified anxiety disorder.

Anxiety disorders are among the most common mental disorders experienced across the lifespan, affecting nearly 30% of adults at some point in their lives (Kessler et al., 2005). Anxiety disorders commonly emerge during childhood, affecting 6.5% of children worldwide with a peak onset age of 5.5 years (Polanczyk et al. 2015; Solmi et al., 2021). The core features of anxiety disorders are the same in children as in adults, although there are some differences in the diagnostic criteria (e.g., a minimum of one physical symptom is required for diagnosing generalised anxiety disorder in children compared to three in adults). The high prevalence of childhood anxiety disorders is concerning because they are associated with impaired outcomes in numerous domains, and considerable economic costs (Pollard et al., 2023). At an individual level, childhood anxiety disorders can increase the risks of continued or re-occurring anxiety disorders and other mental health problems such as depression, suicidality, substance use, eating disorders (Convertino & Blashill, 2022; Essau et al., 2014; Mars et al., 2019; Shevlin et al., 2017). They are also associated with poorer physical health (Chen et al., 2009), educational attainment (Dalsgaard et al., 2020), academic performance (Goodsell et al., 2017), social functioning (Christina et al., 2021; Copeland et al., 2014; Essau et al., 2014), and employment outcomes (Knapp et al., 2011) in later life. At a family level, childhood anxiety disorders have been found to be related to poorer parent-reported family functioning (Towe-Goodman et al., 2014), and caregivers missing work and providing informal care (Bodden et al., 2008; Pella et al., 2020). At a societal level, childhood anxiety disorders can cause increased levels of health care use (Ali et al., 2018) and wider

consequences, such as additional educational support during school age, and lost productivity among parents due to missing work (Pella et al., 2020; van Steensel, et al., 2013).

Cognitive behavioural therapy (CBT) for childhood anxiety disorders

According to cognitive-behavioural models of anxiety, anxious thoughts and cognition play a key role in the development and maintenance of anxiety disorders (Beck et al., 1985; Beck, & Clark, 1997). Specifically, anxious individuals tend to overestimate threats but underestimate their coping abilities. Such cognitive biases could reinforce individuals' avoidant behaviors and anxious affect in a self-perpetuating cycle (Beck, & Clark, 1997). Despite variations in the details of maladaptive thinking and the specific nature of avoidance, these cognitive, behavioural, and emotional processes are common underlying mechanisms shared across all types of anxiety disorders (Rapee et al., 2023).

Cognitive behavioural therapy (CBT) can break this cycle of anxiety by addressing cognitive biases (e.g., overestimating threats and underestimating coping abilities), reducing avoidant behaviors, fostering the development of adaptive coping strategies (Beck, 2005; Beck, & Clark, 1997; Beck et al., 1985). Two core techniques in CBT are cognitive restructuring and graded exposure. Cognitive restructuring targets anxiety-provoking cognitive biases by helping individuals recognise automatic thoughts that trigger anxiety, testing predictions based on those thoughts, developing more realistic and constructive alternatives, and reinforcing new thinking patterns through practice. Graded exposure addresses avoidant behaviours by guiding individuals to confront their fears in a gradually increasing hierarchy. This process allows individuals to test their anxious thoughts in real-world situations, often leading to the realisation that situations are less threatening than expected and that individuals are capable of coping. In addition, many CBT programmes incorporate behavioural training techniques, such as modelling and role playing, to help individuals develop adaptive coping strategies (e.g., problem-solving skills, social skills, relaxation training) and improve coping efficacy.

CBT is the most extensively supported approach for the treatment of childhood anxiety disorders (James et al. 2020). One of the earliest manualised CBT programmes for the treatment of childhood anxiety disorders is *Coping Cat,* developed by Kendall in the 1980s. The original *Coping Cat* programme consists of 16 therapist-led face-to-face sessions

delivered to children individually, and focuses on psychoeducation about anxiety, identifying and modifying anxious thoughts, developing management strategies for anxiety-provoking situations, graded exposure, and self-evaluation with reinforcement (Kendall, 1994). Building on these core components, *Coping Cat* has been adapted for various formats (e.g., group-based) and age groups (e.g., older adolescents aged 14-17 years) (Flannery-Schroeder et al., 2000; Lenz, 2015; Villabø et al., 2018; Walkup et al., 2008). Many randomised controlled trials have demonstrated the effectiveness of all of these *Coping Cat* versions for the treatment of anxiety disorders among children and adolescents aged 7 to 17 (Kendall et al, 1997; Flannery-Schroeder et al., 2000; Lenz, 2015; Villabø et al., 2018; Walkup et al., 2008).

Following the success of *Coping Cat*, more CBT programmes have been developed for the treatment of anxiety disorders in children aged 7-17 years (e.g., *Coping Koala,* Barrett et al., 1996, *Cool Kids,* Rapee et al., 2000b). Most of these programmes consist of six to twelve therapist-led, face-to-face sessions for children delivered individually or in groups, with a strong focus on psychoeducation about anxiety, cognitive restructuring, graded exposure, and the development of adaptive coping strategies (Higa-McMillan et al., 2016). Some programmes also incorporate parent sessions given the significant role parents play in the development and maintenance of childhood anxiety disorders (Manassis et al., 2014). For example, the *Cool Kids* programme developed by Rapee (2000) consists of 10 therapist-led, parallel face-to-face group sessions delivered to children and parents in standard, clinical setting. Its core components include psychoeducation about anxiety, cognitive restructuring, graded exposure, as well as parent management training. Many RCTs have demonstrated the effectiveness of the *Cool Kids* programme for the treatment of anxiety disorders in children aged 7 to 18 years (Rapee, 2000; Rapee et al., 2006; Swain et al., 2015)**.**

Originally developed to treat children with diagnosed anxiety disorders, CBT has also been applied as a preventive approach as intervening early before anxiety difficulties become ingrained could minimise their negative consequences for children, their families, and society (Lawrence et al., 2017). While terms and definitions vary, mental health prevention has typically been classified in two ways: *"universal"* and *"targeted". Universal prevention* aims to reduce the risk of a certain mental health problem across the general population, without targeting individuals based on particular risk factors. For example, *Friends* is one of the most widely used manualised CBT programmes for universal prevention of childhood anxiety disorders with three age-appropriate versions: Fun FRIENDS (4-7 years), FRIENDS for life

(8-11 years) and FRIENDS for life Youth (12-16 years) (Filges et al., 2024). These versions typically include eight to ten face-to-face group sessions plus two follow-up booster sessions delivered by a therapist or a trained schoolteacher to children. The core topics include psychoeducation about anxiety, emotion recognition, cognitive restructuring, graded exposure, adaptive coping strategies (e.g., problem-solving strategies). Some *Friends* programmes also provide separate group sessions for parents, equipping them with knowledge about the programme and strategies for managing their children's anxiety difficulties (Barrett & Turner, 2001; Lowry-Webster et al., 2001).

However, research shows that universal CBT prevention programmes for childhood anxiety disorders like *Friends* are effective only in some conditions, for example, when delivered by mental health professionals rather than schoolteachers (Filges et al., 2024; Stocking et al., 2016). There is also evidence that such universal prevention programmes may be less effective for children with elevated anxiety symptoms, even through those children might be considered to be at greatest risk of developing anxiety disorders (Stallard et al., 2014). In contrast to universal prevention, targeted prevention focuses on children at higher risk for developing anxiety disorders (Lawrence et al., 2017). Elevated anxiety symptoms are a common risk factor used to identify "at-risk" children. For example, van Starrenburg et al. (2017) evaluated an adapted group version of *Coping Cat* among 141 children aged 7-13 with elevated anxiety symptoms at baseline and found it effectively reduced anxiety symptoms compared to a waitlist control. Another established risk factor is behavioural inhibition (Lawrence et al., 2017), a temperament characterised by a tendency to withdraw, avoid, or respond fearfully to new situations (Kagan et al., 1999). Identifiable as early as infancy, behavioural inhibition has been found to triple the risk of developing anxiety disorders in childhood (Sandstrom et al., 2020). Given that, some targeted CBT prevention programmes for childhood anxiety disorders have targeted young, inhibited children and shown positive outcomes. For example, Doyle et al. (2021) evaluated an adapted version of *Cool Kids* for young children (*Cool Little Kids*) among 86 behaviourally inhibited children aged 3-5 years and found it effectively prevented the onset of anxiety disorders and reduced anxiety symptoms compared to a waitlist control. In addition to child elevated anxiety symptoms and behavioural inhibition, parental anxiety has also been identified as a risk factor which may nearly double the likelihood of childhood anxiety disorders (Lawrence et al., 2019). This intergenerational transmission may occur through nonverbal cues, verbal communication of threat, and anxiety-enhancing parenting behaviours (e.g., overprotection) that could restrict

children's exposure to challenging situations, reinforce their avoidance, and limit opportunities for them to develop coping skills and efficacy (Aktar et al., 2013, 2017). Given that, some CBT programmes have been designed to prevent anxiety disorders among children of anxious parents and have shown positive effects. For example, Ginsburg et al. (2015) evaluated a CBT-based programme among 136 children of anxious parents and found it effective in preventing the onset of anxiety disorders compared to an information-monitoring control condition.

Therapist-guided parent-delivered CBT (GPD-CBT) for childhood anxiety disorders

There is vast support for the effectiveness of CBT for the prevention and treatment of childhood anxiety disorders (James et al., 2020; Lawrence et al., 2017). However, the delivery of traditional forms of CBT requires intensive therapist input (e.g., face-to-face contact with therapists in specialist settings), limiting access to only a minority of children who could benefit (Allard et al., 2022; Chavira et al., 2004; Essau, 2005; Reardon et al., 2017). An established way to increase access to psychological services is through a "stepped care" approach, where brief, relatively simple, first-line interventions are provided to those with a relatively good prognosis, while more intensive treatments are reserved for those needing additional support (Thirlwall et al., 2013). Some low-intensity forms of CBT have been developed to increase access, including therapist-guided parent-delivered CBT (GPD-CBT), in which parents work through self-learning materials (e.g., a book, a website) with therapist support (in person or remotely via telephone/video call) to learn how to implement CBT techniques with their child in day-to-day life (Creswell et al., 2010; Thirlwall et al., 2013). Compared to traditional face-to-face therapist-led CBTs, GPD-CBT programmes, especially those delivered in an online format with remote therapist support, can be delivered with markedly fewer resources and reduced therapist input, making it more accessible to a broader population (Creswell et al., 2023; Taylor et al., 2022).

Emerging evidence has demonstrated the effectiveness of GPD-CBT for the prevention and treatment of childhood anxiety disorders. In an early trial, Rapee et al. (2006) compared the effectiveness of a bibliotherapy intervention, in which parents were provided with a self-help book (Rapee et al., 2000a) on using CBT techniques to support their anxious child—to a standard therapist-led, face-to-face group CBT condition and a wait-list control condition among 267 clinically anxious children aged 6–12 years. Results indicated that the

bibliotherapy condition offered some benefits over the wait-list condition; however, it was not as effective as the therapist-led group CBT. Moreover, the bibliotherapy approach showed a higher dropout rate compared to the therapist-led group CBT and the wait-list condition.

To enhance the effectiveness of the bibliotherapy intervention and improve adherence, Lyneham and Rapee (2006) explored the effect of incorporating different forms of therapist contact into the intervention. Specifically, they compared three conditions: nine scheduled therapist-initiated telephone calls, nine scheduled therapist-initiated emails, and parent-initiated contact, in a sample of 100 6-12-year-old children with anxiety disorders living in rural and remote communities. The therapist-initiated telephone support condition yielded the most favourable outcomes: 79% of children in this group no longer met criteria for an anxiety disorder at post-treatment, compared to 33% in the email condition and 31% in the parent-initiated condition.

Building on these findings, growing evidence has supported the effectiveness of book-based, parent-delivered CBT programmes with remote therapist support via telephone, compared to the wait-list condition, for the treatment of anxiety disorders in children aged 7-14 years (Brown et al., 2017; Creswell et al., 2010; Cobham, 2012; Leong et al., 2009; Thirlwall et al., 2013). Some of these programmes have been adapted for online delivery, where parents work through a structured online programme to learn CBT techniques, with remote support from a therapist regularly via telephone or video call (e.g., OSI: Online Support and Intervention for child anxiety, Hill et al., 2022b). This online parent-delivered CBT approach with remote therapist support was initially implemented with children aged 7-12 as an anxiety treatment approach and showed promising outcomes (Hill et al., 2022a; Green et al.; 2023). More recently, it has been applied to younger children who are at risk of anxiety disorders as a targeted prevention approach (e.g., under 8 years) as intervening early before anxiety difficulties becomes entrenched could minimise their consequences for children, their families, and society (Fisak, et al., 2023; Howes et al., 2020). For example, a cluster randomised controlled trial involving 95 infant and primary schools across England found that, compared to usual school practice, an online parent-delivered CBT (i.e., OSI) with remote therapist support was more effective in reducing anxiety symptoms and interference among young children (4-7 years) who were identified at risk of anxiety disorders based on at least one of three risk factors: elevated anxiety symptoms, behavioural inhibition, or parental anxiety (Reardon et al., 2022; Reardon et al., 2024).

Moderators of GPD-CBT

Although increasing evidence has supported the effectiveness of GPD-CBT for the prevention and treatment of childhood anxiety disorders, not all children benefit equally from this approach (Morgan et al., 2017). Understanding what factors may influence the outcomes of this approach (i.e., moderators) can help researchers and clinicians optimise its design and delivery to better support children and families with diverse needs (Domhardt et al., 2021).

Many studies have investigated factors that may influence the effectiveness of therapist-led, child-focused CBT programmes for the prevention and treatment of childhood anxiety disorders, however, their findings may not be fully applicable to GPD-CBT programmes. For example, unlike therapist-led CBT where therapists work directly with children, GPD-CBT places parents at the centre of intervention delivery, with only minimal therapist involvement. As such, the success of GPD-CBT may rely more heavily on parental engagement and implementation. Certain parental characteristics that may influence how they engage with and implement the intervention (e.g., parental relationship with the child, educational background, mental health status, parental motivation for engagement), therefore, may exert a greater impact on its outcomes than in therapist-led child-focused CBT programmes.

Clearly, there is a need for studies to investigate what factors may influence the effectiveness of GPD-CBT for child anxiety specifically. However, to date, only two published studies have addressed this question, and both have limited generalisability due to highly specific sample populations and intervention characteristics. Morgan et al. (2018) examined the moderating effect of a range of demographic factors, child baseline anxiety severity, parental anxiety, parental overprotection on the child anxiety outcomes of an online parent-delivered programme with remote therapist support (available only on request), compared to wait-list control, among 433 families with young, inhibited children (aged 3-6 years). No significant moderators were found, except access to a printer, which was associated with better child anxiety outcomes. One possible explanation, according to authors, was that having access to a printer enabled parents to engage in homework practice more frequently, as printed worksheets not only offered a structured plan for daily activities but also served as a visible reminder, encouraging parents to do consistent graded exposure exercises with their child. However, the generalisability of these findings may be limited to the specific form of GPD-CBT provided in Morgan et al.'s study (i.e., targeting young children with inhibited

temperament, offering therapist support only upon request). Allard et al. (2022) interviewed 15 parents who received a book-based parent-delivered CBT programme with a combination of face-to-face and telephone therapist support for the treatment of anxiety disorders in children aged 7–12 years. This study identified several parent-perceived potential barriers to implementing the intervention, including self-doubt about their ability to deliver it effectively, limited time availability, and certain child anxiety symptoms (e.g., specific phobias and generalised anxiety disorder). In contrast, factors such as the involvement of a second parent and the flexibility of the delivery format (i.e., face-to-face or telephone sessions) were perceived as facilitators of successful implementation. However, it remains unclear whether these results are generalisable to GPD-CBT programmes delivered in other formats and/targeting different populations, such as programmes delivered online, entirely remotely, and/or target younger children (under 7 years).

Mediators of GPD-CBT

Although GPD-CBT has been found to be effective in preventing and treating childhood anxiety disorders (e.g., Morgan et al., 2017; Thirlwall et al., 2013), little is known about how it works. Understanding underlying mechanisms that can explain its effectiveness can enable clinicians to focus on the procedures that target those mechanisms to optimise intervention outcomes, and help researchers identify potential modifications to maximise the impact of those procedures (Domhardt et al., 2019).

Understanding the underlying mechanisms of an intervention for a targeted problem involves identifying its mediators: variables that change because of the intervention, and then lead to the change in the targeted-problem (Kazdin, 2007; Kraemer et al., 2002). While some studies have examined mediators of therapist-led child-focused CBT for child anxiety, it remains unclear whether these findings generalise to GPD-CBT programmes. For example, as outlined earlier, cognitive-behavioural models of anxiety suggest that anxiety is maintained by a self-perpetuating cycle involving cognitive biases (e.g., overestimating threats and underestimating coping abilities) and avoidant behaviours. CBT seeks to break this cycle by helping individuals identify and modify cognitive biases, reduce avoidance, and develop adaptive coping strategies. In line with this framework, previous studies have suggested that children's cognitive biases (e.g., overestimating threats and underestimating coping abilities) and avoidant behaviours may play a mediating role in therapist-led, child-focused CBT

programmes for child anxiety (Ginsburg et al., 2015; Hogendoorn, et al., 2014; Kendall et al., 2016; Luo, & McAloon, 2021; van Starrenburg et al., 2013). GPD-CBT programmes also target these mechanisms by teaching parents CBT strategies to help children manage anxiety-provoking situations. However, unlike therapist-led child-focused CBTs where therapists deliver the intervention directly to children (e.g., Luo & McAloon, 2021; van Starrenburg et al., 2013), GPD-CBT places parents as the primary implementers with only minimal therapist involvement. As a result, the extent to which a GPD-CBT programme can lead to changes in children's cognition biases and avoidance behaviour likely depends on how successfully parents engage with and implement relevant intervention strategies. In addition, since all intervention materials and therapist input in GPD-CBT are directed at parents, with the aim of empowering parents to help children manage anxiety-provoking situations, changes in parents (e.g., how they respond to child anxiety) may play a more central role in its mechanisms than in therapist-led, child-focused CBT and therefore deserve more investigation.

Objectives and outline of this thesis

Childhood anxiety disorders are common and are associated with significant negative outcomes for individuals, families, and society. Cognitive behaviour therapy (CBT) is the most extensively supported approach for the prevention and treatment of child anxiety disorders; however, traditional modes of CBT delivery are resource-intensive and require a lot of therapist input, limiting access for many children in need. An established way to increase access to psychological services is through a "stepped care" approach, where brief, relatively simple, first-line interventions are provided to those with a relatively good prognosis, while more intensive interventions are reserved for those needing additional support. Guided parent-delivered CBT (GPD-CBT) is one such low-intensity form of CBT, in which parents are guided by a therapist in implementing CBT techniques with their child in day-to-day life. Evidence suggests that GPD-CBT programmes, including those delivered in an online form with remote therapist support, can effectively reduce child anxiety. However, little is known about what may influence the outcomes of this approach and how it works. Answering these two questions can help researchers and clinicians optimise the design and delivery of future GPD-CBT programmes to better support children and families with diverse needs. Therefore, this thesis has two objectives. The first objective is to identify factors that may influence child anxiety outcomes of GPD-CBT for child anxiety (moderators). The

second objective to explore underlying mechanisms that explain child anxiety outcomes of GPD-CBT for child anxiety (mediators).

A multi-method approach is used to achieve these two objectives. The first objective is addressed through three sub-studies: a meta-analytic review, a quantitative study, and a qualitative study (chapters two, three, and four). The second objective is addressed through two sub-studies: a quantitative study and a qualitative study (chapters five and six). Fig 1.1 provides an overview of the thesis.

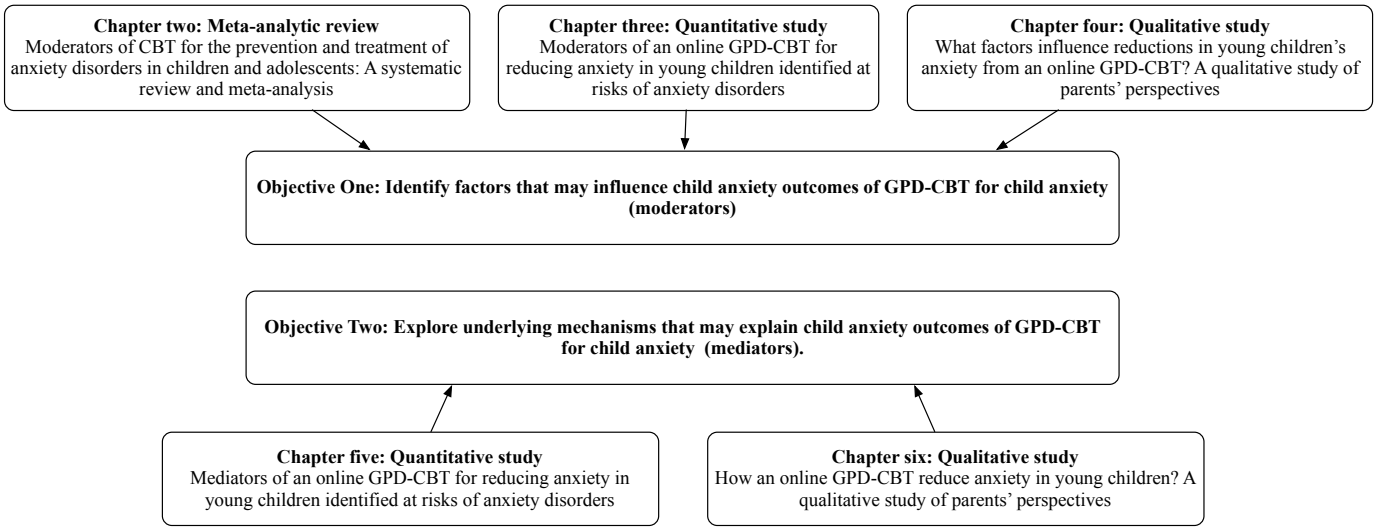

Fig 1.1. Overview of the thesis

Objective One: Identifying factors that may influence child anxiety outcomes of GPD-CBT for child anxiety (moderators)

Chapter 2: A meta-analytic review

The initial aim of this meta-analytic review was to identify potential factors that may influence the effectiveness of GPD-CBT for the prevention and treatment of childhood anxiety by comparing outcomes of existing GPD-CBT programmes reported in randomised controlled trials (RCTs). However, given that GPD-CBT is a relatively novel approach, few RCTs has been conducted to evaluate its effectiveness. Therefore, the scope of the review was broadened to examine moderators of CBT for the prevention and treatment of anxiety disorders in children and adolescents more generally, without a specific focus on GPD-CBT, with the intention that this broader perspective might provide insights into potential moderators that may also be relevant to GPD-CBT.

Chapter 3: A quantitative study

Although the meta-analytic review presented in Chapter 2 provided some insights into the moderators of CBT for the prevention and treatment of anxiety disorders in children and adolescents, only a small number of RCTs (8 out of 86) included in the review specifically evaluated GPD-CBT, making it unclear to what extent the review's findings can be generalised to this specific approach. Moreover, the limited available data, discrepancies between child- and parent-reported outcomes, the wide variation in outcomes and potential confounders across the included trials reduce the certainty of the review findings, indicating the need for individual trials specifically designed to evaluate the effectiveness of any particular form of CBT (e.g., GDP-CBT) for child anxiety and to explore the factors that may influence its outcomes.

In 2021-2023, Reardon and colleagues conducted a cluster randomised controlled trial involving 865 families with young children (4-7 years) who were identified as being at risk of anxiety disorders from 95 mainstream primary/infant schools in England based on at least one risk factor of child elevated anxiety symptoms, behavioural inhibition, parental elevated anxiety. This trial, named *Minimising Young Children's Anxiety through Schools (MY-CATS),* evaluated the effectiveness of an online parent-delivered intervention *(Online Support and Intervention for child anxiety, OSI)* with remote therapist support, compared to usual school practice, for minimising anxiety among "at-risk" young children. Using the quantitative data from MY-CATS study, this chapter examined a broad range of potential moderators (baseline demographic factors, parent/carer motivation for engagement at baseline, child and parent/carer mental health status at baseline, risk profiles) that may influence child anxiety outcomes of the online GPD-CBT programme evaluated in the MY-CATS study. Findings of this chapter could expand our current knowledge about the moderators of GPD-CBT for child anxiety, especially those delivered online, remotely and/or targeting "at-risk" young children.

Chapter 4: A qualitative study

Although the quantitative study presented in Chapter 3 examined a broad range of pre-hypothesised moderators of the online GPD-CBT programme evaluated in the MY-CATS study, it may have missed novel moderators that emerged from participants' experiences. Additionally, it cannot reveal why a factor influences or does not influence the intervention

outcomes, nor can it identify how to maximise the potential positive influence or mitigate the potential negative influence of a factor. However, this information is important for optimising the design and delivery of future similar interventions. To address this gap, this chapter conducted a qualitative study to analyse the transcripts of 19 one-to-one interviews with parents who received the online GPD-CBT intervention evaluated in the MY-CATS study. Inductive reflexive thematic analysis was used to develop an in-depth and comprehensive understanding of parents' perspectives on (1) *what* factors positively or negatively influence the child anxiety outcomes of the intervention? (2) *why* a factor does or does not influence the child anxiety outcomes of the intervention? (3) *how* to maximise the potential positive influences or mitigate the potential negative influences of these factors on child anxiety outcomes of the intervention.

Objective Two: Exploring underlying mechanisms that may explain child anxiety outcomes of GPD-CBT for child anxiety (mediators).

Chapter 5: A quantitative study

Few studies have explored the underlying mechanisms of changes in GPD-CBT for child anxiety. There has been evidence that child intolerance of uncertainty, child behavioural avoidance, child coping efficacy, parental overprotection, and parental self-efficacy play an important role in the development and maintenance of childhood anxiety disorders. Many CBT programmes, included the GPD-CBT programmes evaluated in the MY-CATS study, incorporate strategies that may lead to the changes in these factors. Therefore, building on the quantitative data from the MY-CATS study, this chapter examined whether these factors mediated child anxiety outcomes of the GPD-CBT programme evaluated in the MY-CATS study. Findings of this chapter could expand our current knowledge about the mechanisms of changes in GPD-CBT programmes for child anxiety, particularly those delivered online, remotely, and/or targeting "at-risk" young children.

Chapter 6: A qualitative study

Although the quantitative study presented in Chapter 5 examined several pre-hypothesised mediators of child anxiety outcomes in the GPD-CBT evaluated in the MY-CATS study, it may have missed novel mediators perceived by the participants. Additionally, it cannot reveal how change in each factor happens or how the change of each factor contributes to the

intervention outcomes. However, this information can provide valuable insights for the design and delivery of future interventions. To address this gap, this chapter describes a qualitative analysis of the transcripts of 19 one-to-one interviews with parents who received the GPD-CBT programme evaluated in the MY-CATS study. Inductive reflexive thematic analysis was used to explore parents' perspectives on (1) *what* changes during the intervention contributed to the child anxiety outcomes of the intervention, (2) *how* these changes happened, (3) *how* these changes contributed to the child anxiety outcomes of the intervention.

Author contributions and ethics approval

I declare that I am the primary author of all chapters in this thesis and was fully responsible for the data analysis, writing, editing, and revisions for each individual study. However, the study conceptualisation, design, and proofreading were undertaken in collaboration with my PhD supervisors, Professor Cathy Creswell (CC) and Dr. Tessa Reardon (TR), as well as other study co-authors. For the meta-analytic review presented in Chapter 2 which has been published in 2025 (see the *List of relevant publication*), I led the study conceptualisation, methodological design, data curation, analysis, writing, and editing. CC and TR contributed to the conceptualisation, methodological design, and proofreading. The other co-author, Dr. Urška Košir (UK), served as the second reviewer for data curation and also contributed to proofreading. The quantitative and qualitative studies presented in Chapter 3, 4, 5 and 6 used data from a cluster randomised controlled trial conducted in 95 mainstream primary/infant schools in England. This trial, named *Minimising Young Children's Anxiety through Schools, (MY-CATS*), was funded by the Kavli Trust and approved by the University of Oxford's Medical Sciences Interdivisional Research Ethics Committee (Reference: R62531/RE001). CC (Principal Investigator) and TR led the design of the MY-CATS study and the application of funding. Initial high-level outlines of these quantitative and qualitative studies on moderators and mediators (Chapter 3-6) were proposed by CC and TR as a part of the funding application. I developed the detailed plan for each of these studies and led the data analysis, writing, editing independently with regular discussions with CC and TR. The quantitative data analysed in Chapters 3 and 5 were collected and managed online by the MY-CATS team. The qualitative studies presented in Chapters 4 and 6 were based on one-to-one, semi-structured interviews conducted over the telephone by two MY-CATS research assistants, Natascha Neikamp (NN) and Natasha Pall (NP), using a topic guide

collaboratively developed by NN, TR, and myself. In addition, two external experts, Dr. Helen Manley (HM) and Dr. Gemma Halliday (GH), contributed to the qualitative analyses in Chapters 4 and 6 to enrich the interpretative process and broaden perspectives.

Chapter 2: Moderators of Cognitive and Behaviour Therapies for Prevention and Treatment of Anxiety Disorders in Children and Adolescents: A Systematic Review and Meta-Analysis

Introduction

A meta-analytic review enables systematic comparison of outcomes from existing intervention programmes that differ in sample and intervention characteristics, and can help identify factors that may be associated with better outcomes. As GPD-CBT is a relatively novel approach, limited studies have been conducted to evaluate its effectiveness. This review, therefore, examined moderators of CBT for the prevention and treatment of anxiety disorders in children and adolescents more generally, without focusing exclusively on GPD-CBT, with the aim to provide some insights into potential moderators that may influence the effectiveness of GPD-CBT for child anxiety.

As noted in Chapter 1, CBT is the most extensively supported approach for the prevention and treatment of anxiety disorders in children and adolescents (Lawrence et al., 2017; James et al., 2020). However, not all randomised controlled trials (RCTs) of CBTs for anxiety disorders in children and adolescents report positives outcomes and where positives effects are reported, effect sizes vary (Bodden et al., 2008). Such inconsistent outcomes highlight the need to extend the focus of outcome research from the overall effect of an intervention (i.e., 'what works in general') to understanding which factors (moderators) are associated with the intervention being particularly effective or ineffective (i.e., 'what works for whom') (Kraemer et al., 2002).

CBTs have been used for *universal prevention*, *targeted prevention*, and *treatment* of anxiety disorders in children and adolescents. *Universal prevention* aims at preventing anxiety disorders in children and adolescents from whole populations who have not been identified based on any particular risk factors. *Targeted prevention* targets children and adolescents who are at increased risk of developing anxiety disorders (e.g., elevated anxiety symptoms, behavioural inhibition, parental anxiety). *Treatment* targets children and adolescents who have been diagnosed with an anxiety disorder. Several reviews have investigated the moderators of CBTs for anxiety *treatment* in children and adolescents (e.g., James et al.,

2020), but few reviews have investigated the moderators of CBTs for universal/targeted anxiety *prevention* in children and adolescents. Due to different intervention purposes and targeted populations, CBTs for *universal prevention*, *targeted prevention*, and *treatment* of child and adolescent anxiety disorders may differ in sample and intervention characteristics and have different moderators. Identifying the potential shared or distinct factors influencing their effectiveness can help researchers and clinicians optimise CBT outcomes for children and adolescents at different developmental stages of anxiety disorders.

Sample characteristics

Child age

It is commonly assumed that CBT is effective only after a child reaches a certain level of cognitive development when the child can identify and evaluate a thought or belief against the notion of a 'rational standard' and understand that a thought or belief is related to feelings and behaviours (Kendall, 1993). However, there is also evidence that adolescents may benefit less from CBTs than pre-adolescents because fear expression and extinction may be temporarily impaired during adolescence, making it more difficult to retain new, non-fearful, inhibitory information (Ganella & Kim, 2014; Waters et al., 2017). Furthermore, adolescence may be accompanied by more severe anxiety symptoms, more frequent comorbid depression, and difficulties attending school, which may influence CBT outcomes (Baker et al., 2021; Bodden et al., 2008).

Some reviews have examined the moderating role of child age on the effectiveness of anxiety *prevention* in children and adolescents (Fisak et al, 2011; Lawrence et al., 2017; Teuber & Prinquart, 2011) but none of these reviews specifically focused on the CBT approach. However, some reviews have examined the relationship between child age and outcomes of CBT *treatment* for child and adolescent anxiety disorders (Bennett et al., 2013; James et al., 2020). For example, James et al. (2020) found no difference in diagnostic treatment outcomes across CBT trials for children ≤ 12 years, adolescents ≥ 12 years, and mixed age groups including children and adolescents <12 years and >12 years. However, the lack of trials specifically focused on younger children (e.g., ≤ 8 years) limited conclusions regarding outcomes in this age group.

Child baseline anxiety levels

A number of CBT trials for both anxiety *prevention and treatment* in children and adolescents have investigated the association between child baseline anxiety levels and CBT outcomes, but results have been mixed. Some trials, including both prevention and treatment trials, indicated that participants with higher baseline anxiety levels tended to show greater anxiety reduction but still exhibit higher levels of anxiety after the intervention. This pattern may reflect the fact that those with higher initial severity have more "room for improvement" yet remain more symptomatic overall (Ginsburg et al., 2015; Miller at al., 2011; van Starrenburg et al., 2018; Wergeland et al., 2016). In contrast, some CBT trials, primarily treatment trials, indicated that higher baseline anxiety levels are associated with poorer treatment response (e.g., Compton et al., 2014; Liber et al., 2010; Southam-Gerow et al., 2001; Kunas et al., 2021). This may suggest that children and adolescents with very high levels of anxiety may require longer or more intensive interventions, or additional support beyond standard CBT. Taken together, these inconsistent findings suggest that the moderating role of child baseline anxiety levels on CBT outcomes may vary across intervention purposes (i.e., *prevention/treatment*). This deserves further investigation.

Parental baseline anxiety levels

As noted in Chapter one (see the *Cognitive behavioural therapy for childhood anxiety disorder* section), parental anxiety can increase the risk of anxiety disorders in children, as anxious parents can transmit their anxieties to children through nonverbal cues, verbal communication of threat, and certain parenting behaviours (e.g., overprotection) which can restrict children's exposure to challenging situations and hinder the development of coping ability and efficacy (Aktar et al., 2013, 2017). Some studies have indicated that parental anxiety might also have a detrimental impact on the treatment outcomes of CBTs for child and adolescent anxiety disorders (Kunas et al., 2021). Researchers suggest that may be because anxious parents may face greater challenges in supporting their child's therapeutic process, either due to difficulty engaging with treatment or an association between maternal anxiety and parenting behaviours that may increase the risk of child anxiety disorders (e.g., overprotection) (Cooper et al., 2008). However, this conclusion is not consistently supported across all CBT programmes for the prevention and treatment of anxiety disorders in children and adolescents (Knight et al., 2014; Lundkvist-Houndoumadi et al., 2014; Ginsburg et al, 2015; Simon et al., 2011). Some studies found no association between parental anxiety levels

at baseline and CBT outcomes (Crawford & Manassis., 2001; Ginsburg et al. 2015; Liber et al., 2008). Legerstee et al. (2008) even found that maternal lifetime anxiety disorders were *positively* associated with the outcome of a therapist-led, child-focused, parent-involved CBT treatment for anxiety-disordered adolescents, which, according to the authors, could be attributed to the incorporation of parent-training sessions that may help parents address their own anxiety problems so that they do not impede child treatment outcomes and/or improve their parenting practices. This finding indicates a potential interaction between parental baseline anxiety and parental involvement on CBT outcomes which deserves further investigation.

Intervention characteristics

CBT interventions for anxiety *prevention* and *treatment* in children and adolescents vary in intervention characteristics, such as duration, amount of facilitator contact time, facilitator background (e.g., mental health professionals or school staff), delivery formats (e.g., face-to-face individual/group or remote), and the form of parent involvement (e.g., child-only/parent-only/child-parent CBT) (Higa-McMillan et al., 2016). A few meta-analytic reviews have examined the moderating role of some intervention characteristics on the effectiveness of CBTs for anxiety *prevention* and *treatment* in children and adolescents, but failed to draw firm conclusions (e.g., James et al., 2020; Lawrence et al., 2017). For example, James et al. (2020) examined whether therapist contact time, individual/group format, parent involvement (child-focused, child-and-parent/family, and parent-only) influenced the outcomes of CBT treatment of anxiety disorders in children and adolescents. No evidence was found for the moderating role of therapist contact time or individual/group format, but child-focused CBT showed stronger effects than parent-involved formats. However, the limited available data and potential confounding factors reduce the certainty of these findings. Similarly, Lawrence et al., (2017) examined the moderating role of several intervention characteristics (individual or group format, psychologist-led or teacher-led, child-only or parent-involved) on the effectiveness of CBT for targeted prevention of anxiety disorders in children and adolescents. No significant moderating effect was found, but due to the limited available data and potential confounding factors, these findings should also be interpreted with caution.

Furthermore, when considering the association between intervention characteristics and child outcomes, it is important to note that, in clinical practice, intervention characteristics may

vary in response to particular sample characteristics. For example, a meta-analysis by James et al. (2020) compared the effectiveness of child-only CBTs, parent-only CBTs, and CBTs involving both children and parents for anxiety treatment in children and adolescents. However, most parent-only CBTs included in that meta-analysis were for younger children, making it difficult to disentangle the influence of parent involvement and child age. This finding highlights the need to test the moderating role of parental involvement on the effectiveness of CBTs for *universal prevention*, *targeted prevention* and *treatment* of anxiety disorders in different age groups to minimise the potential confounding effect of child age. This approach would also enable us to understand which forms of parental involvement are more effective for different age groups of children and adolescents.

This review

This review aims to answer the following questions:

1. Do child age and baseline anxiety level moderate the effect of CBTs for universal prevention, targeted prevention, and treatment of anxiety disorders compared to non-active controls (e.g., waitlist group, no intervention group) in children and adolescents?
2. Does parental baseline anxiety level moderate the effect of CBTs for universal prevention, targeted prevention, and treatment of anxiety disorders compared to non-active controls in children and adolescents? Does any moderating effect differ across CBTs with or without content specifically for parents?
3. Do intervention characteristics (intervention duration, amount of facilitator contact time, facilitator background and delivery formats) moderate the effect of CBTs for universal prevention, targeted prevention, and treatment of anxiety disorders compared to non-active controls in children and adolescents?
4. Does the form of parental involvement moderate the effect of CBTs for universal prevention, targeted prevention, and treatment of anxiety disorders compared to non-active controls in different age subgroups?

Method

Study search

For this review the following databases were searched Cochrane Central Register of Controlled Trials (CENTRAL), Ovid MEDLINE, Ovid Embase and Ovid PsycINFO from

database inception date up until November 18, 2024. Search strings are displayed in Appendix 1.1. No restrictions on language and publication status were applied to the searches. The reference lists of all included studies and relevant systematic reviews were checked to identify additional studies missed from the electronic searches. Searches were initially conducted on 31 March 2022 and updated twice on 9 May 2024 and 18 November 2024, using the same strategy.

Eligibility criteria

Studies were eligible for inclusion if they were published in peer-reviewed journals in English and met the following PICOS inclusion criteria: (P) *Population:* children/adolescents younger than 19 years. There was no requirement for diagnostic assessment of anxiety disorders at baseline. Interventions for children/adolescents diagnosed with at least an anxiety disorder were categorised as interventions for *anxiety disorder treatment.* Interventions for children/adolescents from whole populations that had not been identified on the basis of any particular risk factors were categorised as interventions for *universal anxiety prevention.* Interventions for children/adolescents considered to be at risk of developing anxiety disorder (e.g., elevated anxiety symptoms, behavioural inhibition, parental anxiety) were categorised as *targeted anxiety prevention*. (I) *Intervention:* interventions explicitly stating the use of a cognitive and behavioural therapy (CBT) that aimed to change anxiety-provoking cognitions and behaviours. The intervention must be CBT alone, without any combination with pharmacological or other psychological interventions that can work independently without CBT. There was no restriction on the duration, number of sessions, or the content delivered directly to parents. However, facilitator-initiated real-time contact (face-to-face/remote) aimed at facilitating achievement of intervention goals was compulsory. The facilitators could be mental health professionals (e.g., therapists) or other providers (e.g., school staff). (C) *Comparator:* non-active control group, including waiting list, no intervention, usual school practice, placebo (e.g., irrelevant reading material, placebo pills). (O) *Outcome:* children's broad anxiety symptoms assessed using a child-/parent-reported continuous measure. (S) *Study design:* randomised controlled or cluster randomised trials.

In order to reduce the influence of potential confounders (e.g., intervention content, primary anxiety diagnosis/symptom, comorbidity) and increase the ability to detect the effect of targeted moderators, this review exclusively focused on manualised CBTs (i.e., all

participants followed the same intervention protocol) targeting a range of anxiety symptoms or disorders in children and adolescents (i.e., generic anxiety interventions). I excluded individually-tailored CBTs (e.g., modular CBT, personalised CBT) and CBT developed for one specific anxiety disorder (i.e., specific-disorder CBT) due to the specific delivery formats and/or intervention components and measures that may be used during these interventions which might confound study findings. For the same reason, I excluded CBTs that were specifically designed for children and adolescents with non-anxiety health conditions (e.g., depression, attention-deficit hyperactive disorder (ADHD), autistic spectrum disorders (ASD), intellectual disabilities, externalising behavioural problems, physical disease (e.g., cancer, asthma).

Studies comparing CBT to active controls (e.g., treatment as usual, attention controls, medications, other psychological interventions) were also excluded because the wide variation in active control conditions across studies (James et al., 2020) could make it difficult to identify and interpret the effects of targeted moderators. Non-active controls, including waiting lists, placebos, usual school practices, or no-intervention controls, are more consistently used as control conditions in CBT trials for child and adolescent anxiety disorders. Focusing on studies comparing CBT to non-active controls helped reduce minimise variation in control conditions across studies and to identify the effect of target moderators on the effectiveness of CBT compared to non-active controls.

Outcome measures

The primary outcomes of this meta-analysis were child- and parent-reported continuous measures of children's broad anxiety symptoms at post intervention because they are more consistently reported in CBT trials for anxiety prevention and treatment in children and adolescents than diagnostic outcomes (James et al., 2020; Lawrence et al., 2017). Considering the low-to-moderate parent-child agreement on reported anxiety symptoms in children (Popp et al., 2017), I extracted all child- and parent-reported broad measures of children’s anxiety symptoms from each trial and conducted data analysis separately by reporter. If mother- and father-reported measures were reported, I used mother-reported measures (as these were provided more consistently). If multiple relevant child- and/or parent-reported measures were used in one trial, I selected one child- and one parent-reported

measure (where available) based on which were the most frequently used measures among trials included in the corresponding analysis.

Study selection

Two reviewers (SZ and UK) independently screened the title and abstract of all articles identified through the search and coded them as included/maybe/excluded. All articles coded included/maybe by either reviewer were retrieved for full-text screening. I screened the full texts of all retrieved articles to identify eligible studies for inclusion and record reasons for exclusion of the ineligible studies. A random selection of 150 (10% of both the included and excluded articles) were checked by a second reviewer (UK). Agreement between the two coders was found on 98.7 % of the papers, equating to a kappa of 0.91 (p<0.001). Disagreement was resolved in a discussion with CC and TR. Given the high agreement between two reviewers in the first round of screening, I conducted the updated searches and screenings independently.

Data extraction

I extracted data from all eligible trials using a standard form. A random selection of 10% of standard forms were verified by a second reviewer (UK). The form included information on 1) study details (title, author, publication year, study location and setting, RCT or cluster RCT), 2) continuous measures of children's broad anxiety symptoms (measure name, reporter [child/parent], score range, pre- and post-intervention mean, SD and sample sizes in the intervention and control groups), 3) child age at baseline (mean and range), 4) intervention purpose including *universal prevention* for whole populations that had not been identified on the basis of any particular risk factors, *targeted prevention* for those considered to be at risk of developing anxiety disorder (e.g., elevated anxiety symptoms, behavioural inhibition, parental anxiety), or *treatment* for those diagnosed with at least an anxiety disorder, 5) continuous measures of parent self-reported broad anxiety symptoms (measure name, reporter, score range, baseline mean, SD and sample sizes in the intervention and control groups), 6) duration of intervention without any booster sessions (in weeks), 7) number of sessions delivered to children/parents/both, 8) amount of facilitator-initiated real-time facilitator contact time with children/parents/both (in hours), 9) facilitator background (mental health professionals/school staff/others), 10) delivery formats (number of individual/group sessions, number of face-to-face/remote sessions).

Data analysis

The R statistical environment with the metafor and dmetar package were used for data analysis (Harrer et al., 2019; Viechtbauer, 2010). All data analyses were conducted separately on child- and parent-reported outcomes.

Effect size calculation

Following Cochrane guidelines (Version 6.3, 2022, Chapter 8.2.2), this meta-analysis focused on the intention-to-treat (ITT) effect of each intervention at post intervention to get the most conservative results. Therefore, the standardised between-group mean difference (SMD) of children's broad anxiety symptoms between each CBT and non-active control (i.e., Cohen's d), reported by children or parents at post intervention, was calculated using the post-intervention means, standard deviation and sample size of all participants randomised to intervention and control group at baseline (i.e., ITT participants). If the data of ITT participants were not available, I used the data of completers and recorded the potential risks of bias due to deviations from intended interventions and missing outcome data. A small-sample correction was then applied to the Cohen's d values (Borenstein, et al., 2011) resulting in an unbiased estimate of the population standardised mean difference (Hedge's g). As many trials involved clustered designs, I corrected the sample size for clustering using Cochrane guidelines with an average intracluster correlation coefficient (ICC) of 0.02 (James et al., 2020; Parker et al., 2021). If trials had two or more eligible intervention arms to be compared against one control group, I followed Cochrane guidelines (Version 6.3, 2022, Chapter 23.3.4) and divided the control group equally into two or more groups to compare the means and SDs of broad anxiety symptoms in these groups against the means and SDs of broad anxiety symptoms in the two intervention arms.

Moderation analysis

A moderator was examined within the subsets of trials providing data on that moderator. Subgroup analysis and meta-regression was performed for moderation analysis. I followed recommendations that for meta-regression each covariate should contain at least 10 comparisons and for subgroup analysis each subgroup should contain at least 4 comparisons (Borenstein et al., 2011; Fu et al., 2011).

If data were available, *meta-regression analysis* was performed to examine the effect of moderators that could be treated as continuous variables, including child mean age, child baseline anxiety scores, parental baseline anxiety scores, intervention duration without booster sessions (in weeks), amount of facilitator-initiated real-time contact time with children and/or parents (in hours). Child mean age, child baseline anxiety scores, and parent baseline anxiety scores of the entire sample were calculated using the weighted average of the data of the intervention and control groups. Considering the different scaling of different anxiety measures, meta-regressions of child and parent mean anxiety scores at baseline were only conducted within trials using the same anxiety measure. In addition, since the score range of the same measure may also vary across studies, I normalised the raw score of child and parent broad anxiety symptoms at baseline by subtracting the minimum score from the raw score and dividing it by the score range of the scale (i.e., maximum score minus minimum score). A mixed-effects model was used for meta-regression. I reported R^2 of the regression model, which represents the proportion of the difference in true effect sizes that can be explained by the moderator, and the estimated regression coefficient of the moderator with a *p*-value below 0.05 indicating a significant difference.

If data were available, subgroup analyses were performed to examine the effects of moderators that could be coded as categorical variables: child age, intervention duration, amount of facilitator contact time, facilitator background, delivery formats, parental involvement. Categorisation of these moderators are presented in Table 2.1. The pooled effect size, 95% confidence interval and *p* value of each subgroup was calculated using the random-effects model. A pooled effect size was considered to be statistically significant if the *p*-value was below 0.05 or if the confidence interval didn't include zero. A pooled effect size of 0.2 was considered to be a small effect and suggested little practical advantage of one condition over another, 0.5 represented a medium effect and suggested modest practical advantage of one condition over another, and 0.8 a large effect and suggested high practical advantage of one condition over another. Between-group *Q* value was calculated based on mixed-effects model to evaluate the heterogeneity between different groups, with a *p*-value below 0.05 indicating a significant between-group difference.

[Insert Table 2.1 here]

Between-study heterogeneity

I^2 statistics were calculated to evaluate the between-study heterogeneity within each subset of comparisons between CBTs and non-active controls for subgroup analysis. For this review, I^2 value < 30% was considered to indicate small heterogeneity, while a value between 30 and 60% represented moderate heterogeneity, and between 60 and 90% represented substantial heterogeneity (Higgins et al., 2020).

Outlier identification

Outliers were identified from each subset of comparisons between CBTs and non-active controls for subgroup analyses based on the results of influential analysis using the leave-one-out method. Effect sizes that contributed to over 30% between-study heterogeneity and had significant influence on the pooled effect size were identified as outliers. All data analyses (meta-regression analysis, subgroup analysis, test of publication bias) were conducted without outliers to capture a general pattern of the moderators of CBTs for anxiety outcomes in children and adolescents without the influence of trials with extreme small or large effect sizes.

Publication bias

The risk of publication bias was assessed separately among studies providing child-report and parent-report outcomes using Egger's test of funnel plot asymmetry and visual inspection of funnel plots and contour funnel plots with trim and fill method.

Quality assessment

I assessed the risk of bias of all eligible comparisons between CBTs and non-active controls using the Revised Cochrane risk-of-bias tool (RoB 2) for randomised trials and cluster-randomised trials (Higgins et al., 2020). The revised RoB 2 provides different assessment criteria for reviews focusing on the effect of assignment of intervention (intention-to-treat effect) and the effect of adhering to intervention (per-protocol effect). Since this review focused on the intention-to-treat (ITT) effect, the criteria for the effect of assignment to intervention was used to assess the risk of bias of each comparison in five domains: 1) randomisation process; 2) deviations from intended interventions (adherence to intervention protocol and appropriate analysis to estimate the effect of assignment); 3) missing outcome data; 4) measurement of outcome; 5) selection of the reported results. Each included

comparison was rated as showing "low risk of bias", "some concerns", or "high risk of bias" on each domain. The risk of bias in individual domains across comparisons were summarised narratively.

Results

Study characteristics

The systematic literature search identified 22,488 articles. After excluding 19,553 irrelevant articles, 1,381 full-text articles were assessed for eligibility. A total of 86 studies met eligibility criteria (see Fig 2.1), among which 12 studies included two eligible active intervention arms to be compared against a single non-active control. Therefore, a total of 98 trials of CBTs versus non-active controls were included in this meta-analysis, including 31 trials of CBTs for *universal prevention*, 31 trials of CBTs for *targeted prevention*, 36 trials of CBTs for *treatment*. Based on that, I obtained 89 child-reported effect sizes and 54 parent-reported effect sizes, representing the post-intervention mean difference in children's broad anxiety symptoms between CBT and non-active control conditions (See Appendix 1.2 for a list of all included trials and Appendix 1.3 for the sample and intervention characteristics of all included trials).

[Insert Fig 2.1 here]

Moderating role of child age

Universal prevention: Meta-regression analysis of child-reported outcomes indicated a significant association between child age and the post-intervention effect sizes between universal CBT prevention and non-active control conditions (k=22, b=-0.07, p=0.03, R^2=29.11%), with older age being associated with greater effect sizes. Subgroup analyses of child-reported outcomes were conducted between each pair of the following three age groups: preadolescent children (≤12 but not all ≤8 years) (Hedge's g =-0.09, p>0.05, 95%CI-0.24 to 0.06, I^2=51.8%, k=12), adolescents (≥12 years) (Hedge's g =-0.56, p=0.05, 95%CI-1.13 to 0.02, I^2=68.6%, k=5), and mixed child/adolescent samples (≥12 and <12 years) (Hedge's g =-0.40, p=0.05, 95%CI-0.79 to 0.00, I^2=85.2%, k=7). Universal CBT prevention for adolescents showed a significantly greater post-intervention pooled effect size than those for preadolescent children (Q=4.60, p=0.03). No other significant between-group differences were found (Q=0.37 to 3.12, p=0.08 to 0.55). No trials of CBT for universal anxiety

prevention versus non-active controls in young children (≤8 years) provided child-reported outcomes, so this was not included in this subgroup analysis.

Meta-regression analysis of parent-reported outcomes indicated no significant association between child age and the post-intervention effect sizes between universal CBT prevention and non-active controls (k=10, b=-0.00, p=0.85, R^2=0.00%). Subgroup analysis of parent-reported outcomes was not conducted given the limited available data.

Targeted prevention*:* Meta-regression analysis of child-reported outcomes indicated no significant association between child age and the post-intervention effect sizes between targeted CBT prevention and non-active control conditions (k=20, b=-0.04, p=0.46, R^2=0.00%). Subgroup analyses of child-reported outcomes were conducted between each two pairs of the following three age groups: preadolescent children (≤12 but not all ≤8 years) (Hedge's g =-0.27, p>0.05, 95%CI-0.61 to 0.07, I^2=61.6%, k=11), adolescents (≥12 years) (Hedge's g =-0.96, p=0.05, 95%CI-1.89 to -0.03, I^2=90.1%, k=8), and mixed child/adolescent samples (≥12 and <12 years) (Hedge's g =-0.08, p>0.05, 95%CI-0.37 to 0.21, I^2=55.2%, k=7). Targeted CBT prevention for adolescents showed a significantly greater post-intervention pooled effect size than those for mixed child/adolescent samples (Q=4.56, p=0.03). No other significant between-group differences were found (Q=0.98 to 2.66, p=0.32 to 0.97). Only one trial of CBT for targeted anxiety prevention versus a non-active control in young children (≤8 years) provided child-reported outcomes, so this was not included in this subgroup analysis.

Meta-regression analysis of parent-reported outcomes indicated no significant association between child age and the post-intervention effect sizes between targeted CBT prevention and non-active controls (k=16, b=0.02, p=0.47, R^2=0.00%). Subgroup analysis of parent-reported outcomes was conducted between two age groups: young children (≤8 years) (Hedge's g =-0.34, p<0.05, 95%CI-0.58 to -0.10, I^2=15.7%, k=5) and preadolescent children (≤12 but not all ≤8 years) (Hedge's g =-0.25, p>0.05, 95%CI-0.66 to 0.16, I^2=70.2%, k=6). No significant between-group difference was found (Q=0.25, p=0.62). Fewer than four trials of CBTs for targeted anxiety prevention versus non-active controls in adolescents (≥12 years) and mixed child/adolescent samples (≥12 and <12 years) provided parent-reported outcomes, so these were not included in this subgroup analysis.

Treatment*:* Meta-regression analysis of child-reported outcomes indicated no significant association between child age and the post-intervention effect sizes between CBT treatment and non-active control conditions (k=25, b=-0.06, p=0.42, R^2=0.00%). Subgroup analyses of child-reported outcomes were conducted between three age groups: preadolescent children (≤12 but not all ≤8 years) (Hedge's g =-0.25, p>0.05, 95%CI-0.52 to 0.02, I^2=51.2%, k=9), adolescents (≥12 years) (Hedge's g =-0.73, p>0.05, 95%CI-2.36 to 0.91, I^2=90.0%, k=4), and mixed child/adolescent samples (≥12 and <12 years) (Hedge's g =-0.90, p<0.001, 95%CI-1.23 to -0.57, I^2=80.3%, k=20). CBT treatment for mixed child/adolescent samples showed a significantly greater post-intervention effect size than those for preadolescent children (Q=10.97, p<0.001). No other significant between-group differences were found (Q=0.10 to 0.83, p= 0.36 to 0.74). No trials of CBT treatment versus non-active controls in young children (≤8 years) provided child-reported outcomes.

Meta-regression analysis of parent-reported outcomes indicated no significant association between child age and the post-intervention effect sizes between CBT treatment and non-active controls (k=22, b=0.02 p=0.61, R^2=0.00%). Subgroup analyses of parent-reported outcomes were conducted between each pair of the following three age groups: preadolescent children (≤12 but not all ≤8 years) (Hedge's g =-0.37, p<0.05, 95%CI-0.66 to –0.08, I^2=48.9%, k=8), adolescents (≥12 years) (Hedge's g =-0.35, p>0.05, 95%CI-1.59 to 0.89, I^2=79.0%, k=4), and mixed child/adolescent samples (≥12 and <12 years) (Hedge's g =-0.72, p<0.001, 95%CI-0.97 to -0.47, I^2=62.3%, k=14). CBT treatment for mixed child/adolescent samples showed a significantly greater post-intervention effect size than those for preadolescent children (Q=4.39, p=0.04). No other significant between-group differences were found (Q=0.00 to 0.85, p=0.06 to 0.36). Only one trial of CBT treatment versus a non-active control in young children (≤8 year) provided parent-reported outcomes, so this was not included in this subgroup analysis.

Moderating role of child baseline anxiety levels

Universal prevention*:* To examine the moderating role of child self-reported baseline anxiety levels on child-reported anxiety outcomes of CBT for universal anxiety prevention, meta-regression analysis was conducted within 12 trials of CBTs for universal anxiety prevention versus non-active controls using the same child-reported measure of child broad anxiety symptoms (i.e., Spence Children's Anxiety Scale, SCAS). No significant moderating

effect was found (k=12, b=-0.013, p=0.58, R^2=0.00%). Meta-regression on parent-reported outcomes was not conducted given the limited available data.

Targeted prevention*:* Meta-regression analysis was not conducted on either child- or parent-reported outcomes as no child- or parent-reported measure of child broad anxiety symptoms was used in 10 or more trials of CBT for targeted anxiety prevention versus non-active controls.

Treatment*:* Meta-regression analysis of child-reported outcomes was conducted for 17 trials of CBT treatment versus non-active controls using the Spence Children's Anxiety Scale (SCAS) and 14 trials of CBT treatment versus non-active controls using the Revised Children's Manifest Anxiety Scale (RCMAS). No significant moderating effect was found (SCAS: k=17, b=-0.02, p=0.70, R^2=0.00%; RCMAS: k=14, b=0.012, p=0.3780, R^2=0.00%). Meta-regression analysis of parent-reported outcomes was conducted for 15 trials of CBT treatment versus non-active controls using the same parent-reported measure of child broad anxiety symptoms (i.e., Spence Children's Anxiety Scale-Parent Version, SCAS-P). No significant moderating effect was found (k=15, b=-0.03, p=0.28, R^2=7.65%).

Moderating role of parental baseline anxiety levels

The moderating role of parental baseline anxiety levels and its interactive effect with parental involvement were not examined because only three trials of CBTs versus non-active controls included in this review provided data on parental baseline anxiety levels, including one trial of parent-only CBT for targeted anxiety prevention in young children (≤ 8 years) and two trials of CBT for anxiety treatment in mixed child/adolescent samples (≥12 and <12 years) (one parent-only CBT and one child-focused CBT with high parental involvement).

Moderating role of intervention duration

Universal prevention*:* Meta-regression analysis showed no significant moderating role of intervention duration on child-reported (k=26, b=0.02, p=0.59, R^2=0.00%) or parent-reported (k=10, b=0.05, p=0.34, R^2=0.00%) post-intervention effect sizes between universal CBT prevention and non-active controls. Subgroup analysis on child-/parent-reported outcomes was not conducted because there was little variation in intervention duration, with most CBTs for universal prevention (26 out of 31 included in this review) lasting 8-12 weeks.

Targeted prevention: Meta-regression analysis showed no significant moderating role of intervention duration on child-reported post-intervention effect sizes between targeted CBT prevention and non-active controls (k=25, b=-0.04, p=0.32, R^2=1.83%). However, subgroup analysis of child-reported outcomes indicated a significant difference in post-intervention effect sizes between targeted CBT prevention lasting for less than 8 weeks and those lasting for 8-12 weeks (Q=5.68, p=0.02). Targeted CBT prevention lasting for 8-12 weeks showed a significant pooled effect size compared to non-active controls (Hedge's g=-0.46, p<0.05, 95%CI-0.86 to -0.06, I^2=78.6%, k=16), but those lasting for less than 8 weeks did not (Hedge's g=0.05, p>0.05, 95%CI-0.19 to 0.30, I^2=11.7%, k=7). Only three trials of targeted CBT prevention lasting for more than 12 weeks versus non-active controls provided child-reported outcomes, so these were not included in this subgroup analysis.

Meta-regression analysis of parent-reported outcomes indicated no significant association between intervention duration and the post-intervention effect sizes between targeted CBT prevention and non-active controls (k=16, b=0.01, p=0.81, R^2=0.00%). Subgroup analysis of parent-reported outcomes was not conducted as most targeted CBT prevention programmes that provided parent-reported outcomes (13 out of 16) lasted for 8-12 weeks.

Treatment*:* Meta-regression analysis of child-reported outcomes indicated no significant association between intervention duration and the post-intervention effect sizes between CBT treatment and non-active controls (k=32, b=-0.02, p=0.59, R^2=0.00%). Subgroup analysis of child-reported outcomes was conducted between CBT treatment lasting for 8-12 weeks (Hedge's g =-0.52, p<0.05, 95%CI-0.86 to -0.16, I^2=80.3%, k=17) and CBT treatment lasting for more than 12 weeks (Hedge's g =-0.92, p<0.001, 95%CI-1.32 to -0.52, I^2=85.0%, k=15). No significant between-group difference was found (Q=2.74, p=0.10). Only one trial of CBT treatment lasting for less than 8 weeks versus a non-active control provided child-reported outcomes, so this was not included in this subgroup analysis.

Meta-regression analysis of parent-reported outcomes indicated no significant association between intervention duration and the post-intervention effect sizes between CBT treatment and non-active controls (k=27, b=-0.02, p=0.55, R^2=0.00%). Subgroup analysis of parent-reported outcomes also indicated no significant difference in post-intervention effect sizes between CBT treatment lasting for 8-12 weeks (Hedge's g=-0.40, p<0.05, 95%CI-0.66 to -

0.14, I^2=63.7%, k=15) and CBT treatment lasting for more than 12 weeks (Hedge's g=-0.68, p<0.001, 95% CI-0.95 to -0.41, I^2=60.7%, k=11) (Q=2.64, p=0.10). Only one trial of CBT treatment lasting for less than 8 weeks versus a non-active control provided parent-reported outcomes, so this was not included in this subgroup analysis.

Moderating role of facilitator contact time

Universal prevention*:* Meta-regression analysis indicated no significant moderating role of the amount of facilitator contact time on the child- (k=26, b=0.00, p=0.87, R^2=0.00%) or parent-reported (k=10, b=0.00, p=0.78, R^2=0.00%) post-intervention effect sizes between universal CBT prevention and non-active control. Subgroup analysis of child-reported outcomes indicated no significant difference in post-intervention effect sizes between universal CBT prevention involving 9-16 hours of facilitator contact time (Hedge's g=-0.26, p<0.05, 95%CI-0.46 to -0.06, I^2=79.1%, k=13) and those involving less than 9 hours of facilitator contact time (Hedge's g=-0.29, p>0.05, 95%CI-0.71 to 0.13, I^2=74.0%, k=9) (Q=0.02, p=0.89). Only three trials of universal CBT prevention involving more than 16 hours of facilitator contact time versus non-active controls provided child-reported outcomes, so they were not included in this subgroup analysis. Subgroup analysis of parent-reported outcomes was not conducted given the limited available data.

Targeted prevention*:* Meta-regression analysis indicated no significant moderating role of the amount of facilitator contact time on the child- (k=25, b=-0.00, p=0.80, R^2=0.00%) or parent-reported (k=16, b=0.00, p=0.72, R^2=0.00%) post-intervention effect sizes between targeted CBT prevention and non-active controls. Subgroup analysis of child-reported outcomes indicated no significant difference in post-intervention effect sizes between targeted CBT prevention involving less than 9 hours of facilitator contact time (Hedge's g=-0.09, p>0.05, 95%CI-0.46 to 0.29, I^2=26.0%, k=6), 9-16 hours (Hedge's g=-0.37, p=0.03, 95%CI-0.69 to -0.05, I^2=75.2%, k=13), and those involving more than 16 hours of facilitator contact time (Hedge's g=-0.18, p<0.05, 95%CI-0.30 to -0.05, I^2=0.00%, k=6) (Q=0.34 to 1.87, p=0.17 to 0.56). Subgroup analysis of parent-reported outcomes was not conducted given the limited available data.

Treatment*:* Meta-regression analysis indicated no significant association between the amount of facilitator contact time and the child- (k=32, b=-0.00, p=0.15, R^2=7.55%) or

parent-reported (k=27, b=-0.00, p=0.63, R^2=0.00%) post-intervention effect sizes between CBT treatment and non-active control conditions. However, subgroup analysis of child-reported outcomes indicated a significant difference in post-intervention effectiveness between CBT treatment involving less than 9 hours of facilitator contact time and those involving 9-16 hours of facilitator contact time (Q=7.50, p=0.006). Specifically, CBT treatment involving 9-16 hours of facilitator contact time compared to non-active controls showed a significant pooled effect size (Hedge's g=-1.02, p<0.001, 95%CI-1.45 to -0.60, I^2=85.7%, k=14), but those involving less than 9 hours of facilitator contact time did not (Hedge's g=-0.27, p>0.05, 95%CI-0.70 to 0.15, I^2=68.3%, k=11). CBT treatment involving more than 16 hours of facilitator contact time also showed a significant pooled effect size compared to non-active controls (Hedge's g=-0.62, p<0.01, 95%CI-0.93 to -0.31, I^2=61.6%, k=8). However, its pooled effect size did not significantly differ from those with less than 9 hours or 9-16 hours of facilitator contact time (Q=2.26 to 2.87, p=0.09 to 0.13).

Subgroup analysis of parent-reported outcomes indicated that CBT treatment with less than 9 hours (Hedge's g=-0.48, p<0.005, 95%CI-0.71 to -0.24, I^2=42.9%, k=11), 9-16 hours (Hedge's g=-0.53, p=0.05, 95%CI-1.07 to 0.00, I^2=82.6%, k=9), more than 16 hours (Hedge's g=-0.67, p<0.01, 95%CI-0.98 to -0.36, I^2=35.3%, k=7) of facilitator contact time all showed significant pooled effect sizes compared to non-active controls, and no significant difference was observed between each pair of the three subgroups (Q=0.05 to 1.37, p=0.24 to 0.83).

Moderating role of facilitator background and delivery formats

Universal prevention: Almost all universal CBT prevention programmes in trials included in this review were delivered in a face-to-face group format (30 out of 31) by mental health professionals or school staff. Subgroup analysis of child-reported outcomes indicated a medium and significant pooled effect size for universal CBT prevention facilitated by mental health professionals compared to non-active controls (Hedge's g=-0.43, p<0.001, 95%CI-0.62 to -0.24, I^2=67.0%, k=16), which was significantly greater than the small and non-significant pooled effect size between universal CBT prevention facilitated by school staff versus non-active controls (Hedge's g=0.05, p>0.05, 95%CI-0.36 to 0.46, I^2=83.2%, k=9) (Q=5.88, p=0.02). However, subgroup analysis of parent-reported outcomes indicated that neither universal CBT prevention facilitated by mental health professionals (Hedge's g=-0.00, p>0.05, 95%CI-0.29 to 0.28, I^2=0.00%, k=4) nor universal CBT prevention facilitated by

school staff (Hedge's g=0.04, p>0.05, 95%CI-0.12 to 0.20, I^2=0.00%, k=5) was significantly more effective than compared to non-active controls. The between-group difference was not significant (Q=0.19, p=0.66).

Targeted prevention*:* Almost all targeted CBT prevention programmes in trials included in this review were delivered by mental health professionals in a face-to-face individual or group format (27 out of 31). Subgroup analysis of child-reported outcomes indicated that group format showed significant pooled effect sizes compared to non-active controls (Hedge's g=-0.22, p<0.05, 95%CI-0.41 to -0.03, I^2=54.9%, k=18) but individual formats did not (Hedge's g=0.05, p>0.05, 95%CI-0.61 to 0.71, I^2=46.8%, k=4). However, no significant between-group difference was found (Q=1.43, p=0.23). Subgroup analysis of parent-reported outcomes was not conducted given the limited available data.

Treatment*:* All CBT treatments in trials included in this review were facilitated by mental health professionals in a face-to-face individual or group format or in a remote format (i.e., CBT providing remote facilitator-initiated real-time contact, such as internet-based CBT or bibliotherapy CBT with therapist support provided remotely via telephone/video calls). Subgroup analysis of child-reported outcomes indicated no significant difference in post-intervention effect sizes between face-to-face individual (Hedge's g=-0.93, p<0.01, 95%CI-1.44 to -0.41, I^2=84.6%, k=10) and group formats (Hedge's g=-0.68, p<0.001, 95%CI-1.00 to -0.36, I^2=64.1%, k=13) (Q=0.84, p=0.36). Similarly, subgroup analysis of parent-reported outcomes indicated no significant difference in post-intervention effect sizes between face-to-face individual (Hedge's g=-0.46, p>0.05, 95%CI-1.05 to 0.13, I^2=81.6%, k=8) and group formats (Hedge's g=-0.70, p<0.001, 95%CI-0.99 to -0.41, I^2=50.1%, k=9) (Q=0.72, p=0.40).

According to child-reported outcomes, the pooled effect size of remote CBT treatment compared to non-active controls was not significant (Hedge's g=-0.20, p>0.05, 95%CI-0.62 to 0.23, I^2=56.7%, k=6), and was significantly smaller than that of face-to-face individual CBT treatment (Q=6.67, p=0.01) and that of face-to-face group CBT treatment (Q=4.69, p=0.03). However, according to parent-reported outcomes, remote CBT treatment was significantly more effective than non-active controls (Hedge's g=-0.60, p<0.05, 95%CI-0.95 to -0.26, I^2=50.4%, k=7) and showed a comparable pooled effect size compared to face-to-face individual and group CBT treatment (Q=0.25 to 0.26, p=0.61 to 0.62).

Moderating role of parental involvement in different age groups

Given the limited available data, I was only able to examine the moderating role of parental involvement within trials of CBT for universal anxiety prevention versus non-active controls in preadolescent children (≤12 but not all ≤8 years) and trials of CBT for anxiety treatment versus non-active controls in mixed child/adolescent samples (≥12 and <12 years).

Among the 12 trials involving CBT for universal anxiety prevention versus non-active controls in preadolescent children, 8 involved child-only CBT (all facilitator contact was with children) and 4 involved child-focused CBT with limited parental involvement (some facilitator contact time with parents, but less contact with parents than with children). Subgroup analysis of child-reported outcomes indicated a significant difference between the two subgroups (Q=6.02, p=0.01). Child-focused CBTs with limited parental involvement showed a significant pooled effect size compared to non-active controls (Hedge's g=-0.25, p=0.01, 95%CI-0.41 to -0.10, I^2=0.00%, k=4), but child-only CBTs did not (Hedge's g=-0.02, p>0.05, 95%CI-0.21 to 0.17, I^2=57.2%, k=8). Subgroup analysis of parent-reported outcomes was not conducted because of the limited available data.

Among the 19 trials involving CBT for anxiety treatment versus non-active controls in mixed child/adolescent samples, 2 involved child-only CBTs, 10 involved child-focused CBTs with limited parental involvement, 5 involved child-focused CBTs with high parental involvement (some facilitator contact time with children, but less contact with children than with parents), 3 involved parent-only CBTs (all facilitator contact was with parents). Subgroup analysis of child-reported outcomes indicated that both child-focused CBTs with limited parental involvement (Hedge's g=-0.89, p<0.05, 95%CI-1.42 to -0.36, I^2=86.4%, k=10) and CBTs with high parental involvement (Hedge's g=-0.81, p=0.001, 95%CI-1.09 to -0.52, I^2=0.00%, k=5) were significantly more effective than non-active controls, and no significant difference was found between the two subgroups (Q=0.10, p=0.75). Subgroup analysis on parent-reported outcomes was not conducted because of the limited available data.

Publication bias

After removing outliers, visual inspection of funnel plots (see Fig 2.2 and Fig 2.3) and Egger's intercept regression tests showed evidence of significant publication bias based on both child-reported (k=81, t=-4.68, p<0.0001) and parent-reported outcomes (k=53, t=-4.10,

p<0.0001). Further contour funnel plots using the trim and fill method further revealed that all missing studies were in the areas of non-significant or significantly negative results, indicating a marked absence of published trials of CBT versus non-active controls for anxiety in children and adolescents with non-significant or negative results.

[Insert Fig 2.2 and Fig 2.3 here]

Quality assessment

Fig 2.4 showed a summary of quality assessment results. The risk of bias of each comparison between CBT and non-active control was provided in Appendix 1.4.

[Insert Fig 2.4 here]

Risk of bias due to randomisation process: Among the 98 trials of CBT versus non-active control conditions included in this review, 61 did not provide sufficient information on the randomisation process and allocation concealment, 6 showed imbalanced child baseline anxiety levels between the intervention and control groups, indicating a high risk of bias due to the randomisation process.

Risk of bias due to deviations from intended interventions: Given the nature of psychological interventions, blinding of either participants or personnel delivering the interventions is impossible for trials included in this meta-analysis involving CBT versus non-active controls. Adherence to intervention protocol was reported to be good in 47 trials of CBT versus non-active controls, while 50 did not provide sufficient information about adherence. One trial reported low adherence to intervention protocol, indicating a high risk of bias due to deviations from the intended interventions. In addition, 21 trials either did not report intention-to-treat (ITT) analysis outcomes or did not clarify whether the reported outcomes were based on ITT analysis. Among these, 10 trials showed evidence that their reported outcomes might significantly deviate from those expected under ITT analysis, indicating a high risk of bias due to deviations from intended interventions.

Risk of bias due to missing outcome data: Among the 98 trials of CBT versus non-active control conditions included in this review, 27 reported outcome data for all participants, 21 provided evidence that their results were not biased due to missing data (e.g., sensitivity analysis), 8 clarified that the reasons of missingness were not related to outcomes. Among the

remaining 42 trials, 15 found no specific difference between missing and no-missing samples, 20 did not provide sufficient information on the missing pattern, 7 showed imbalanced missing data across groups, with more missing data in the CBT group than in the non-active control group, indicating a high risk of bias due to missing outcome data.

Risk of bias due to measurement of outcome: As is typical in trials of psychological interventions, all included trials of CBT versus non-active controls showed a high risk of bias due to measurement of outcomes because the primary outcomes of this meta-analysis were children's broad anxiety symptoms reported by children or parents who were not blind to group allocation. The results reported by parents and children in intervention groups could be influenced by their knowledge of the intervention.

Risk of bias due to selection of the reported results: All included trials of CBT versus non-active controls reported the post-intervention mean and SD of all child/parent-reported measures of children's broad anxiety symptoms listed in the methods section. Therefore, there was not a high risk of bias due to selection of the reported results as observed in this meta-analysis.

Discussion

This review aimed to provide meta-analytic evidence for the moderating role of sample characteristics (child age, child baseline anxiety levels, parental baseline anxiety levels) and intervention characteristics (intervention duration, facilitator contact time, facilitator background, delivery formats, parental involvement) on the post-intervention broad anxiety symptom outcomes of CBTs for universal/targeted prevention and treatment of anxiety disorders in children and adolescents compared to non-active controls. Its findings provide insights into the question of what works for whom, however, should be interpreted cautiously given the limited available data, wide variations in outcomes, potential confounders, and discrepancies between child- and parent-reported outcomes. The following sections discuss the results of data analyses, the implications and limitations of these results, and priorities for future studies.

Child age

Given the potential confounding factors and limited available data, I was not able to draw clear conclusions about the association between child age and the effectiveness of CBTs for universal/targeted anxiety prevention or anxiety treatment. Specifically, although both meta-regression and subgroup analysis of child-reported outcomes indicated that older age was associated with greater effect sizes of CBTs for universal anxiety prevention versus non-active controls, which may suggest a need for caution when implementing CBT programmes for universal anxiety prevention in preadolescent children, it may also reflect age-related measurement issues rather than true differences in effect (Creswell et al., 2021). Furthermore, although targeted CBT prevention for adolescents showed significantly larger effect sizes than those for mixed child/adolescent samples, I found no significant difference between the effectiveness of targeted CBT prevention for adolescents and preadolescent children-specific groups. Similarly, although subgroup analysis of child-reported outcomes indicated that CBT treatment for mixed child/adolescent samples showed significantly larger effect sizes than those for preadolescent children, I found no significant difference between the effectiveness of CBT treatment for preadolescent children and adolescent-specific groups. The wide age range of participants included in mixed child/adolescent samples made it difficult to draw conclusions on whether this was a specific effect of age. These findings highlight the need for more CBT trials that target specific age groups, as well as for trials with broad age ranges to report outcomes separately by narrower age groups, in order to better understand how child age may influence the effectiveness of CBT for anxiety prevention and treatment in children and adolescents.

In addition, only a few trials included in this review evaluated CBTs specifically designed for young children (≤ 8 years) and the majority of these trials only provided parent-reported outcomes. This is understandable given that young children may not be able to respond reliably to anxiety symptom measures (Spence et al., 2001). Indeed, there is a lack of well validated self-report measures for children under the age of 8 years, with studies most typically relying on parent report for this age group（Creswell et al., 2021). However, given that relatively few trials evaluating CBTs for preadolescent children and adolescents provided parent-reported outcomes, it was impossible in this review to compare the effectiveness of CBTs for young children (≤ 8 years) with those for older age groups. To facilitate such comparisons, it may be helpful for future CBT trials targeting preadolescent children and adolescents to also provide parent-reported anxiety symptom outcomes. However, even when

parent reports are available across all age groups, the measures used may vary, and even when the same parent-report measure is employed across all age groups, it may not function equivalently, as parents' perceptions of children's anxiety symptoms may change with children' age (Creswell et al., 2021; Zhou et al; 2024). Therefore, to enable meaningful comparisons of child anxiety symptom outcomes from CBT programs across age groups—whether within individual trials that include children spanning a wide age range or in meta-analytic reviews such as the present one—it is important not only to improve consistency in informants and measurement tools across different age groups, but also to examine and establish the measurement invariance of these tools across different age groups to ensure that the results are truly comparable (Creswell et al., 2021).

Child baseline anxiety levels

Meta-regression analysis indicated no significant association between child baseline anxiety levels and either child or parent-reported effectiveness of CBTs for universal/targeted anxiety prevention or anxiety treatment. However, the small number of data points for the meta-regression analysis may have reduced the certainty of these results. Due to the different scaling across different anxiety measures, I performed meta-regression analyses within CBT trials that used the same anxiety measure which limited the data available for analysis. For example, meta-regression analysis of child baseline anxiety on the effectiveness of CBTs for targeted anxiety prevention was not performed because no single child anxiety symptom measure (child/parent report) was used in 10 or more trials. These results, once again, highlights the need to improve consistency in measures of child anxiety symptoms across trials to facilitate outcome comparison and moderator investigations.

Parent baseline anxiety levels

I was not able to test the moderating role of parental baseline anxiety levels and its potential interaction with parental involvement as only three of the included trials provided relevant information and each of these three trials evaluated CBTs involving parent sessions. Considering the potential influence of parental anxiety on the effectiveness of CBTs for child and adolescent anxiety (Kunas et al., 2021), I encourage researchers to assess and explicitly report parental anxiety status when evaluating the effectiveness of CBTs for child and adolescent anxiety in order to investigate how parental anxiety may influence intervention outcomes and what strategies may mitigate any potential negative effects.

Intervention duration

I was also unable to draw clear conclusions on the association between intervention duration and the effectiveness of CBTs for universal/targeted anxiety prevention due to limited available data and potential confounding factors. In terms of limited available data, most CBTs for universal anxiety prevention (26 out of 31) lasted for 8-12 weeks. Such lack of variability in duration may explain the non-significant association between duration and the effectiveness of CBTs for universal anxiety prevention. In terms of potential confounding factors, I found that CBT for targeted anxiety prevention lasting for less than 8 weeks showed significantly smaller effect sizes compared to those lasting for 8-12 weeks. It is possible that longer duration may provide children with more time to learn and practise CBT skills (Fujii et al., 2013; Perihan et al., 2020), or foster a stronger therapeutic alliance that can improve intervention outcomes (Feindler & Smerling, 2022; Kendall et al., 2009). Or, if assessment points are linked to intervention completion, it may be that longer duration allows more time for changes to occur. In this case, what may truly matter is not the duration of the intervention, but when the assessment is conducted. To further reveal the association between intervention duration and CBT effectiveness while reducing the confounding effect of assessment time points, future research could usefully compare the effectiveness of CBTs with different durations measured at the same time point (e.g., comparing the effectiveness of 4-week and 8-week CBTs evaluated 12 weeks after randomisation and at longer term follow-up assessments).

Furthermore, I found no significant difference in the effectiveness of CBTs for anxiety treatment lasting 8-12 weeks compared to those lasting more than 12 weeks. While this finding may suggest that extending the duration of a CBT treatment from 8-12 weeks to more than 12 weeks does not necessarily enhance its effectiveness, the wide variations in reported effect sizes within two subgroups reduces the certainty of this finding and highlights the need for further investigation to fully understand reasons for those variations. In addition, only one trial comparing CBT treatment lasting for less than 8 weeks (6 weeks) to a non-active control group was included in this review (Cobham, 2012), limiting my ability to investigate whether brief CBT programmes for anxiety treatment under 8 weeks can be as effective as longer programmes. This highlights an important question for future research to explore, especially considering the 6-week CBT treatment for child anxiety included in this review demonstrated

significant effectiveness in reducing child anxiety symptoms and diagnoses compared to the non-active control group (Cobham, 2012).

Amount of facilitator contact time

Given that reducing the amount of facilitator contact time may help increase access to and the cost-effectiveness of an intervention, it is notable that I found no significant association between facilitator contact time and the effectiveness of CBTs for universal/targeted anxiety prevention. However, the wide variation in reported effect sizes across trials evaluating interventions with less than 9 hours and 9-16 hours of facilitator contact time reduces the certainty of this finding and highlights the need for further investigation to fully understand reasons for this variation.

I was also unable to draw clear conclusions on the association between facilitator contact time and CBT treatment outcomes due to potential confounding factors and discrepancies between child- and parent-reported outcomes. In terms of potential confounding factors, my subgroup analysis of child-reported outcomes indicated that CBT treatment with less than 9 hours of facilitator contact time showed significantly smaller effect sizes than those with 9-16 hours of facilitator contact time, suggesting that limited amount of facilitator contact time may result in unsatisfactory outcomes. However, this finding differs from James et al.'s review (2021) which found no difference in outcomes from CBT treatment involving less than 10 hours of facilitator contact time compared to interventions with more facilitator contact time. This inconsistency may be due to the different inclusion criteria used in the two reviews. James et al.'s review (2021) focused on face-to-face CBT treatments. However, this review included both face-to-face and remote CBT treatments, and most CBT treatments with less than 9 hours of facilitator contact time were delivered in remote formats (7 out of 8). As a result, it is difficult to distinguish whether the difference in CBT treatment outcomes across facilitator contact time observed in this review was due to the amount of facilitator contact time or delivery formats (face-to-face or remote).

In terms of discrepancies between child- and parent-reported outcomes, our subgroup analysis of child-reported outcomes indicated that CBT treatment with less than 9 hours of facilitator contact time were not significantly more effective than non-active controls with significantly smaller effects to CBT treatment with 9-16 hours of facilitator contact time.

However, subgroup analysis of parent-reported outcomes that included almost all of the same trials, indicated that CBT treatment with less than 9 hours of facilitator contact time was significantly more effective than non-active controls and showed a comparable effect to CBT treatment with 9-16 hours of facilitator contact time. This discrepancy between child- and parent-reported outcomes may indicate measurement issues related to reporters (Creswell et al., 2021), making it difficult to draw clear conclusions about the association between facilitator contact time and CBT treatment outcomes.

Facilitator background and delivery formats

Almost all CBTs for universal anxiety prevention in this review were delivered in a face-to-face group format. However, according to child-reported outcomes, those facilitated by school staff showed significantly smaller effects than those facilitated by mental health professionals and were not significantly more effective than non-active controls. This finding highlights the need for caution when delivering school staff-facilitated CBT for universal anxiety prevention in children and adolescents and the need for further investigation to understand what influences its outcomes and how to improve its effectiveness.

All of the CBT programmes for targeted anxiety prevention included in this review except one were delivered face-to-face by mental health professionals (27 out of 31). Among these, the majority were delivered in a face-to-face group format (18 out of 27), limiting my ability to investigate which delivery formats work better for targeted anxiety prevention in children and adolescents. More recently novel forms of CBT (e.g., online parent-delivered/self-help CBT with therapist remote support) have been applied for targeted anxiety prevention (e.g., Reardon et al., 2022). With this increased variability in delivery format, it will be critical to continue to evaluate and compare the effectiveness of CBTs for targeted anxiety prevention across different formats.

All of the CBT treatments included in this review were delivered by mental health professionals in a face-to-face individual/group format or a remote format. I found no significant difference between face-to-face individual and group formats, which was inconsistent with one previous network meta-analysis of psychotherapies for anxiety treatment in children and young people which reported favourable outcomes for group compared to individual formats (Zhou et al., 2019). There are multiple reasons for this

inconsistency. Firstly, my review focused on the between-group mean difference of child anxiety symptoms between CBT and non-active control groups, while Zhou et al. (2019) focused on the post-treatment CBT outcomes measured as the mean change scores of child anxiety symptoms from baseline to end points. Secondly, my review extracted all child- and parent-reported measures of child broad anxiety symptoms from each trial and conducted data analysis separately by reporter, while Zhou et al. (2019) prioritised child self-report outcomes. Third, my review categorised delivery formats into three categories: face-to-face individual, face-to-face group, and remote formats. However, Zhou et al. (2019) categorised delivery formats into two categories: individual and group formats. Most group CBT treatments were delivered face-to-face, whereas individual CBT treatments could be delivered either face-to-face or remotely. As a result, it is difficult to determine whether the difference in effects across delivery formats found by Zhou et al. (2019) was caused by individual vs. group formats or face-to-face vs remote formats. Fourth, to reduce potential confounding factors, this review focused on trials of CBT treatments targeting a range of anxiety disorders in children and adolescents without non-anxiety health conditions (e.g., ADHD, ASD). However, Zhou et al. (2019) included trials of disorder-specific CBT treatments and CBT treatments for children and adolescents with non-anxiety health conditions. It is important to note that CBT treatments that differ in delivery format may also differ in other ways that may also influence treatment outcomes. For example, James et al. (2020) found that the majority of CBT treatments targeting a specific anxiety disorder in children and adolescents (e.g., social anxiety disorder) were delivered in a group format, indicating that the difference in effect sizes for individual versus group delivery formats observed in Zhou et al.'s review (2019) may in fact be due to other factors, such as treatment targets, rather than the individual or group format. Therefore, I do not feel that the evidence is sufficient to assert that face-to-face group CBT holds an advantage over face-to-face individual CBT for treating anxiety disorders in children and adolescents.

Furthermore, although child-reported outcomes indicated significantly smaller effects for remote CBT treatments (all facilitator contact happened remotely, e.g., internet-based CBT or bibliotherapy CBT with therapist remote support via telephone/video calls) compared to face-to-face individual/group CBT treatments, these results should be interpreted cautiously for a number of reasons. Firstly, the wide variation in child-reported outcomes observed in the small number of remote CBT treatments versus non-active controls reduces the precision of the subgroup analysis. Secondly, all remote CBT treatment included in the review involved

less than 9 hours of facilitator contact time, making it difficult to distinguish between the influence of delivery formats and facilitator contact time. Third, despite including almost the same trials, subgroup analyses of child- and parent-reported outcomes showed different results. Specifically, child-reported outcomes indicated that remote CBT treatment was not superior to-active controls and was inferior to face-to-face individual/group CBT treatment. However, parent-reported outcomes indicated that both face-to-face individual/group CBT treatment and remote CBT treatment were superior to non-active controls, with no significant difference between face-to-face and remote formats. This discrepancy between child- and parent-reported outcomes indicates that the difference identified for child-reported outcomes may reflect measurement issues rather than true differences in effects. As such, on the basis of current available evidence, I believe it is too premature to conclude that remote CBTs are less effective than face-to-face CBTs for anxiety treatment in children and adolescents. Given the potential value of remote formats in terms of increasing accessibility and cost-effectiveness of an intervention (Podina et al., 2016), I call for more trials to evaluate the effectiveness of remote CBTs for anxiety prevention and treatment in children and adolescents and assess whether it is an effective but more accessible alternative to face-to-face CBTs for preventing and treating anxiety disorders in children and adolescents.

Parental involvement in intervention for different age groups

To reduce the potential confounding effect of child age, this review examined the moderating role of parental involvement on CBT outcomes in different age groups. This approach, although necessary, resulted in limited data for analysis. For example, child-reported outcomes indicated that, for preadolescent children (≤12 but not all ≤8 years), child-focused CBTs with 'limited' parental involvement for universal anxiety prevention (some facilitator contact time with parents, but less contact with parents than with children) showed significantly greater effectiveness compared to child-only CBTs (all facilitator contact was with children), indicating that parental involvement may enhance the effectiveness of CBTs for universal anxiety prevention among this age group. However, I was not able to examine the consistency of this finding in other age groups, as all CBTs for universal anxiety prevention in young children (≤8 years) included in this review were classified as 'child-focused CBTs with limited parental involvement', while most CBTs for universal anxiety prevention in adolescents (≥ 12 years) and mixed child/adolescent samples (≥12 and <12 years) were child-only CBTs (10 out of 14).

Similarly, the moderating role of parental involvement on the effectiveness of CBTs for targeted anxiety prevention was not examined in any age group given the limited available data. In terms of CBT treatment, subgroup analysis could only be conducted to compare child-focused CBTs with 'limited' parental involvement and 'high' parental involvement for mixed child/adolescent samples (≥12 and <12 years) and found no significant difference. Clearly, there is a great deal more work to be done to understand of the degree to which parental involvement may affect child outcomes in different age groups.

Discrepancies between child- and parent-report outcomes

As discussed earlier, the discrepancies between parent- and child-reported outcomes observed in several subgroups could reduce the certainty of some of our findings. For example, almost all CBT treatments with less than 9 hours of facilitator contact time and remote CBT treatments provided both child- and parent-reported outcomes. However, parent-reported outcomes exhibited greater effect sizes for these CBT treatments than child-reported outcomes. Several factors may help explain such discrepancies. For example, there is evidence that preadolescent children's (e.g., aged 9-12) self-reported anxiety symptoms tend to show lower stability and weaker consistency with parent-reported child anxiety symptoms, and are less predictive of concurrent and future child anxiety diagnoses than parent-report symptoms. However, as children grow older (e.g., adolescents aged 12-15), the stability of child self-reported anxiety symptoms increases, along with their consistency with parent-reported child anxiety symptoms and child anxiety diagnoses (Hyand et al., 2022). In line with this, there is also evidence that, when evaluating the effects of anxiety treatment for preadolescent children, parent-reported anxiety symptom outcomes tend to be more often consistent with clinical diagnostic outcomes than child-reported anxiety symptom outcomes (Evans et al., 2017). Some studies involving preadolescent samples have even failed to demonstrate significant changes in child-reported anxiety symptoms following CBT, despite observing significant changes in diagnostic and parent-reported outcomes (e.g., Rapee et al., 2017). Consistent with that, in this review, most trials of CBT treatment with less than 9 hours of facilitator contact time and remote CBT treatment providing both child- and parent-reported outcomes targeted preadolescent children (≤12 but not all ≤8 years) or mixed child/adolescent samples (≥12 and <12 years) rather than adolescents (>12 years). The inclusion of younger participants, whose self-reports may be less reliable, could have

amplified discrepancies between child- and parent-report outcomes. Moreover, it's worth noting that more than half of CBT treatments evaluated in these trials (4 out of 7) were parent-only CBT or child-focused CBT with high levels of parental involvement. Parental involvement in these CBT treatments may have increased the risk of bias in their reports of treatment outcomes. For instance, parents in the intervention group may interpret and respond to measurement items differently because of their exposure to the intervention content, thereby potentially compromising measurement invariance of parent-reported measures of child anxiety symptoms between the intervention and control groups. Taken together, these findings suggest that certain sample and intervention characteristics may have led to the discrepancies between child- and parent-reported anxiety symptom outcomes in CBT trials for child anxiety. Future research should further explore the factors that may influence the consistency between child- and parent-reported outcomes, to help researchers and clinicians prioritise reporters based on the unique features of each CBT programme.

Limitations of included trials

First, significant publication bias was observed among the included CBTs trials, which, consistent with previous reviews (e.g., James et al., 2020) indicates a tendency of journals to publish trials on this topic with positive results. Furthermore, according to the results of quality assessment, 62% of the included CBT trials exhibited some level of risk of bias due to the randomisation process, 44% showed risks of bias related to missing data, 56% trials did not report the extent to which the intervention adhered to the protocol, and 20% trials either did not follow the intention-to-treat principle or did not provide sufficient information regarding it. In addition, using child- and parent-reported measures of child anxiety symptoms as primary outcomes may lead to bias. Specifically, the reliability of child self-reported anxiety symptoms may vary with children's age. Evidence suggests that, among preadolescent children (e.g., 9-12 years), child self-reported anxiety symptoms tend to show limited stability and weak consistency with both parent-reported symptoms and clinical anxiety diagnoses (Hyand et al., 2022). Parent-reported child anxiety symptoms tend to be more stable and aligned with clinical diagnoses in younger children. However, relying on parent-reported child anxiety symptoms to evaluate intervention outcomes may introduce other risks of bias. Firstly, anxiety symptoms are internalising experiences that can be elusive to others. Parents need to look for their children's observable behaviours described in the PAS items that indirectly reflect anxiety symptoms, but such behaviours may not always be readily

noticeable in everyday life (Mesman & Koot, 2000). Furthermore, certain parental characteristics may increase risk of bias in parent-reported child anxiety symptoms. For example, evidence suggests that parents with elevated anxiety may be more sensitive to, and more likely to perceive, potential signs of anxiety in their children, making it unclear to what extent parent-reported child anxiety symptoms reflect the children's actual anxiety symptom levels (Francis, 2014; Zhou et al., 2024). In addition, exposure to the intervention content may lead children and parents in the intervention group to interpret measurement items differently compared with those in control groups, potentially increasing risk of bias into the evaluation of intervention effects.

Strengths and limitations of this review and future directions

This review demonstrates several strengths compared to previous reviews investigating moderators of CBT for the prevention and treatment of anxiety disorders in children and adolescents (Howes et al., 2020; Lawrence et al., 2017; James et al. 2020; Zhou et al., 2019). First, it examined moderators separately across CBT for universal prevention, targeted prevention, and treatment, allowing for the identification of potential shared or distinct factors that may influence CBT outcomes for children and adolescents at different developmental stages of anxiety. Additionally, moderation analyses were conducted separately for child-report and parent-report outcomes, which could reduce bias arising from differences in measures and informants. Furthermore, this review adopted a cautious and nuanced approach to interpreting findings: rather than drawing firm conclusions prematurely, it carefully considered the potential impact of the limited available data, wide variations in outcomes, potential confounders, and discrepancies between child- and parent-reported outcomes. Future meta-analytic reviews exploring moderators of psychological intervention effectiveness should also account for these considerations. Despite these strengths, the review has several limitations that should be taken into account when interpreting its findings.

Eligibility criteria

This review has several limitations related to its eligibility criteria. First of all, in order to reduce the influence of potential confounding factors (e.g., intervention content, primary anxiety diagnosis/symptom, comorbidity) and increase our ability to detect the effect of targeted moderators, this review excluded individually tailored CBTs, disorder-specific CBTs, and CBTs designed for children and adolescents with other non-anxiety health conditions (e.g., depression, ADHD, ASD, intellectual disabilities, etc) due to the specific delivery

formats and/or intervention components and measures that may be used during these interventions which might confound study findings. Therefore, caution is needed when generalising its findings to these CBT programmes.

Furthermore, in order to minimise the variation in control conditions across included studies and detect the effect of target moderators, this review exclusively focused on studies comparing CBTs to "non-active controls" (e.g., waiting lists, placebos, usual school practices, or no-intervention controls). As a result, findings of this review are limited to the moderating role of sample and intervention characteristics on the effectiveness of CBT compared to non-active controls. Exploring factors that may moderate the effectiveness of CBT compared to a specific type of "active control" would provide valuable insights to guide recommendations for selecting appropriate interventions for different populations, but this opportunity is currently limited by the small number of studies comparing CBT to active controls, and the broad range of "interventions" in these active control arms (e.g., treatment as usual, attention controls, medications, other psychological interventions, James et al., 2020). Treating all existing active controls as a single category would make it difficult to draw meaningful conclusions about the targeted moderators and the lack of studies comparing CBT to a single specific type of "active control" makes it difficult to explore moderators of CBT effectiveness compared to a particular active control. Future trials that compare CBT to clearly defined and consistent active controls would allow for a more nuanced understanding of the factors that influence the relative effectiveness of CBT for the prevention and treatment of child and adolescent anxiety disorders compared to specific active control conditions.

In addition, this review only included articles published in English and in peer-reviewed journals to set a standard for the quality of the included studies. However, the inclusion of studies published in languages other than English, unpublished studies, partially published studies, and studies published in 'grey' literature sources such as dissertations, theses and conference abstracts can help reduce the risk of language or indexing bias and publication bias and increase the pool of available data for analysis. Future reviews may consider including those studies but would also need to be aware of the potential risk of bias this alternative approach could introduce, particularly because unpublished studies that can be located may be an unrepresentative sample of all unpublished studies (Higgins et al., 2020).

Outcomes

This review examined the moderators of effectiveness of CBT in reducing child and parent report of child anxiety symptoms, which are commonly reported across CBT trials for anxiety prevention and treatment. However, as discussed earlier, both child- and parent-reported outcomes have limitations (see the *Limitation of included trials* section of this Chapter). Another important indicator of CBT effectiveness in this field is changes in child anxiety diagnosis (remission, absence, or presence) and severity as assessed by independent mental health professionals using structured tools such as the Anxiety Disorders Schedule—Child Version (Silverman et al., 1996). Further investigation into the moderators of these clinician-assessed outcomes would also be valuable.

Furthermore, this review specifically focused on post-intervention outcomes, as relatively few RCTs reported longer-term follow-up outcomes of CBT groups compared to non-active controls (James et al., 2020; Lawrence et al., 2017). However, the effectiveness of CBTs for anxiety prevention and treatment in children and adolescents may vary over time (Ginsburg, 2015, 2018, 2021; Rasing et al., 2017). The factors that moderate the short-term outcome of a CBT intervention may differ from those that moderate its longer-term outcomes (Thirlwall et al., 2017). Further investigation into the moderators of CBT outcomes over time would be helpful for enhancing the maintenance of intervention gains and reducing the risk of relapse.

Categorisation of moderators

To facilitate comparisons between the results of this review and previous ones, I used the same cut off points as previous reviews (when available) when categorising moderators for subgroup analysis. However, some cut off points could be somewhat arbitrary (e.g., age groups, intervention duration, amount of facilitator contact time). It is also important to acknowledge that some of our categorisation approaches may result in the loss of information. For example, remote CBT in this review is classified as CBT which provided facilitator-initiated real-time contact aimed at facilitating achievement of intervention goals and all contact happened remotely (internet-based or bibliotherapy CBT with therapist remote support via telephone/video calls). Therefore, review findings on remote CBTs cannot be generalised to full self-help internet-based or bibliotherapy CBT without any facilitator-initiated real-time support. Similarly, this review classified parental involvement into four categories (child-only, child-focused with limited parental involvement, child-focused with

high parental involvement, parent-only) according to the amount of facilitator contact time with parents and children. However, it is likely that *how* parents are involved and *what* is done with parents matters more than how much time is spent (Lawrence et al., 2021). Further studies investigating the role of parental involvement in CBT for child and adolescent anxiety should explore in greater detail the specific forms of parental involvement and the content provided to them.

Statistical analysis

This review used meta-regression analysis and subgroup analysis to investigate the moderators of CBTs for anxiety prevention and treatment in children and adolescents. However, both approaches have limitations. Meta-regression operates under the assumption of linear relationships, potentially leading to less accurate results in non-linear scenarios. In terms of subgroup analysis, the small numbers of studies, wide variations in outcomes, or both, observed in several subgroups could limit my ability to identify significant between-group difference. Even where a significant difference was observed between subgroups, the presence of potential confounding factors could make it difficult to draw meaningful conclusions (e.g., intervention duration and assessment point, face-to-face/remote and facilitator contact time). To minimise the interference of potential confounders and reveal the true effect of moderators of interests, I call for more experimental research, dismantling studies, and efficacy trials specifically designed for identifying moderators of interest with other factors controlled. Qualitative studies are also needed to delve into the underlying reasons behind moderation effects.

Conclusion

Despite these limitations, this is the first meta-analytic review specifically focusing on the moderating role of sample and intervention characteristics on the effectiveness of CBTs for the universal prevention, targeted prevention, and treatment of anxiety disorders in children and adolescents compared to non-active controls. However, the limited available data, wide variations in outcomes, potential confounders, and discrepancies between child- and parent-reported outcomes limited my ability to draw firm conclusions about any moderators or make recommendations for clinical decision-making based on any significant or non-significant moderating effect identified in this review. Clearly, there is a great deal more work to be done to understand what works for whom, to then develop more effective CBT interventions for

the prevention and treatment of anxiety disorders in children and adolescents. Specifically, individual trials evaluating the effectiveness of a CBT intervention should further investigate the moderating role of sample characteristics (e.g., child age, child baseline anxiety levels, parental anxiety) using both quantitative and qualitative methods, to understand who may benefit from the intervention, who may not, and why. High-quality experimental research, dismantling studies, and efficacy trials incorporating both non-active and active control groups are also needed to evaluate and compare the effectiveness of CBT programmes varying in a specific intervention characteristic within the same sample group, to understand which types of CBT programmes work better for the population being targeted.

Table 2.1. Coding list of subgroups

Potential moderator	Subgroup name	Definition
Child age	1 Young children	CBTs where all participants aged 8 or younger (≤8 years)
	2 Preadolescent children	CBTs where all participants aged 12 or younger but must include participants over age 8 (≤12 years but not all ≤8 years)
	3 Adolescents	CBTs where all participants aged 12 or older (≥12 years)
	4 Mixed child/adolescent samples	CBT included a mixed preadolescent and adolescent sample under and over age 12 (≥12 and <12)
Intervention duration	1 Short-term CBT	CBT lasted 8 weeks or below without booster sessions.
	2 Medium-term CBT	CBT lasted 8-12 weeks without booster sessions.
	3 Long-term CBT	CBT lasted 12 weeks or above without booster sessions.
Facilitator contact time	1 Limited contact time	Total amount of facilitator-initiated real-time contact time with parent, child, or both <9 hours.
	2 Medium contact time	Total amount of facilitator-initiated real-time contact time with parent, child, or both 9-16 hours.
	3 Long contact time	Total amount of facilitator-initiated real-time contact time with parent, child, or both >16 hours.
Facilitator background and delivery formats	1 Face-to-face individual CBT by mental health professional	All sessions were facilitated by mental health professionals face-to-face in individual format.
	2 Face-to-face group CBT by mental health professional	All sessions were facilitated by mental health professionals face-to-face in group format.
	3 Face-to-face group CBT by school staff	All sessions were facilitated by school staff trained by therapists before the intervention face-to-face in group format.
	4 Remote CBT	CBT provided facilitator-initiated real-time contact and all contact happened remotely, such as internet-based CBT or bibliotherapy CBT with therapist remote support via telephone/video calls.
Parent involvement	1 Child-only CBT	All facilitator contact was with children, no facilitator contact time with parents.
	2 Child-focused CBT with limited parent involvement	Some facilitator contact time with parents, but less contact with parents than with children.
	3 Child-focused CBT with high parent involvement	Some facilitator contact time with children, but less contact with children than with parents.
	4 Parent-only CBT	All facilitator contact was with parents, no facilitator contact time with children.

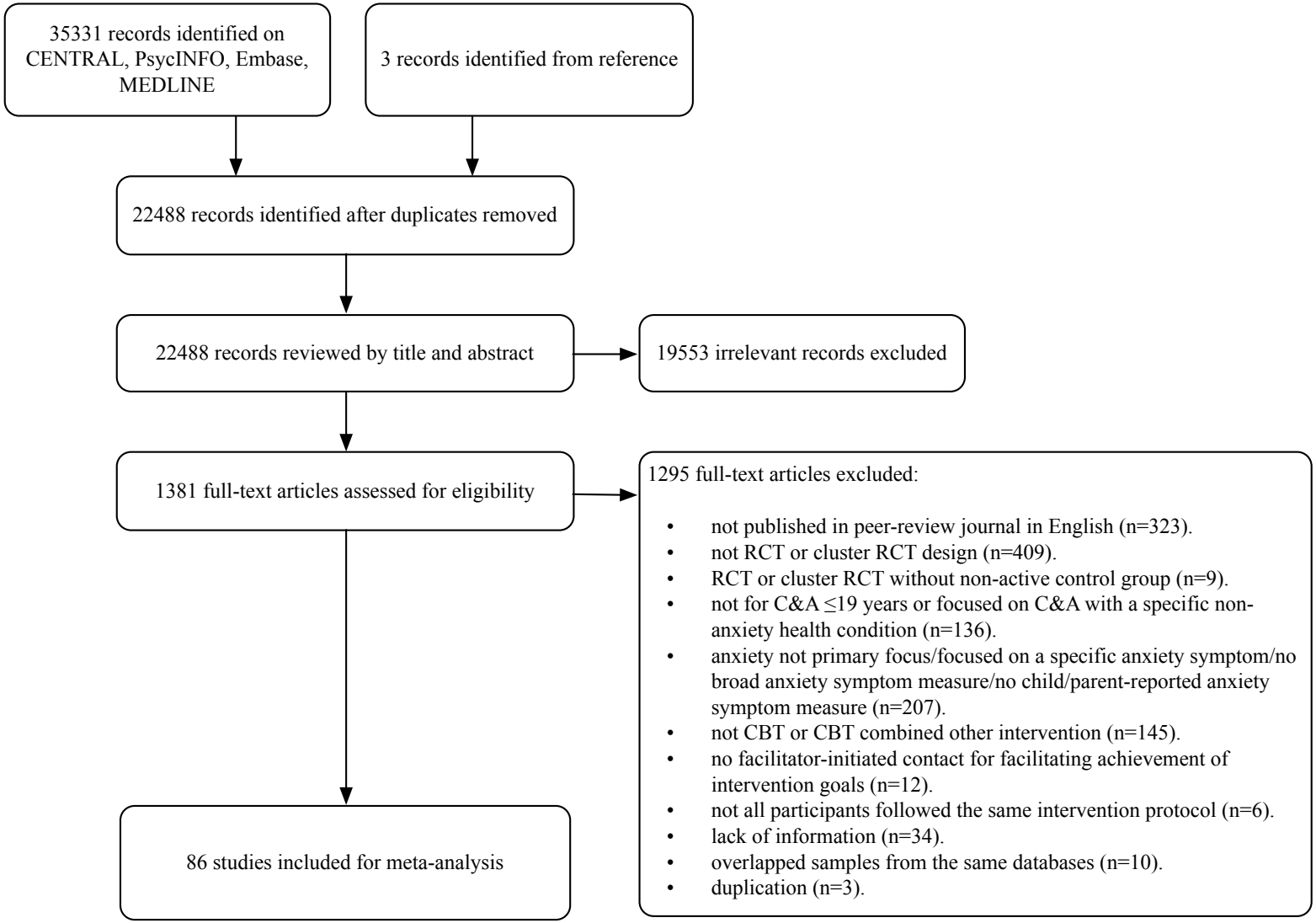

Fig 2.1. Flow diagram of the study selection

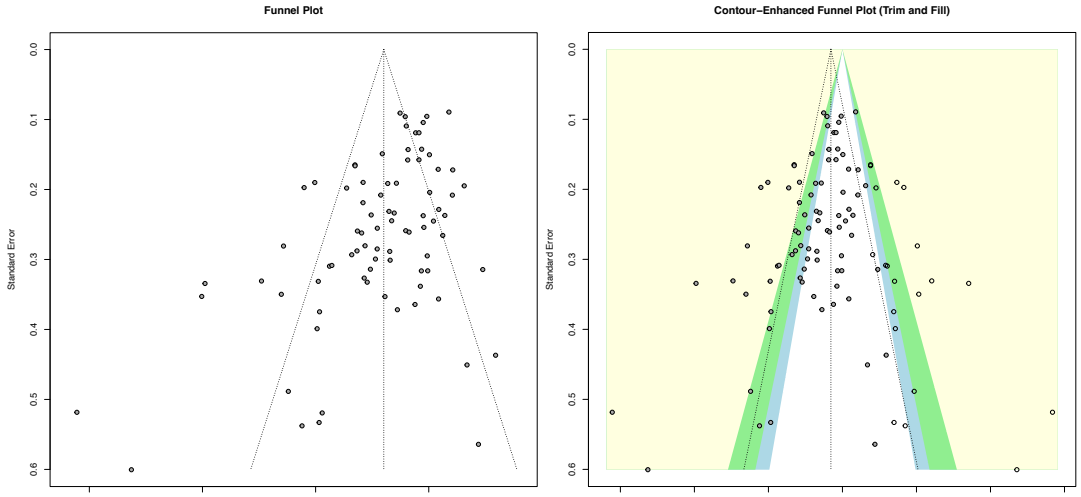

Fig 2.2. Funnel plot of CBTs providing child-reported outcomes (left) and Contour funnel plot of CBTs providing child-reported outcomes using trim and fill method (right)

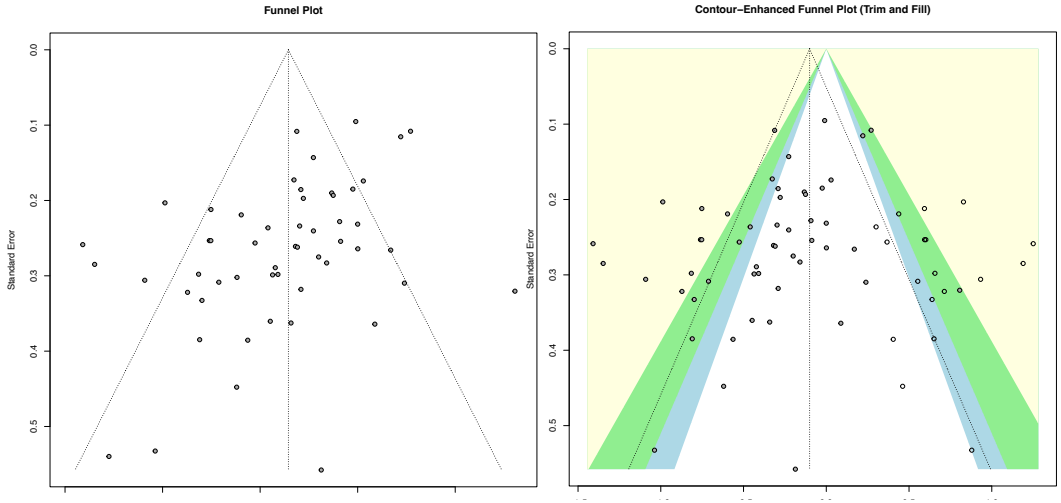

Fig 2.3. Funnel plot of CBTs providing parent-reported outcomes (left) and Contour funnel plot of CBTs providing parent-reported outcomes using trim and fill method (right)

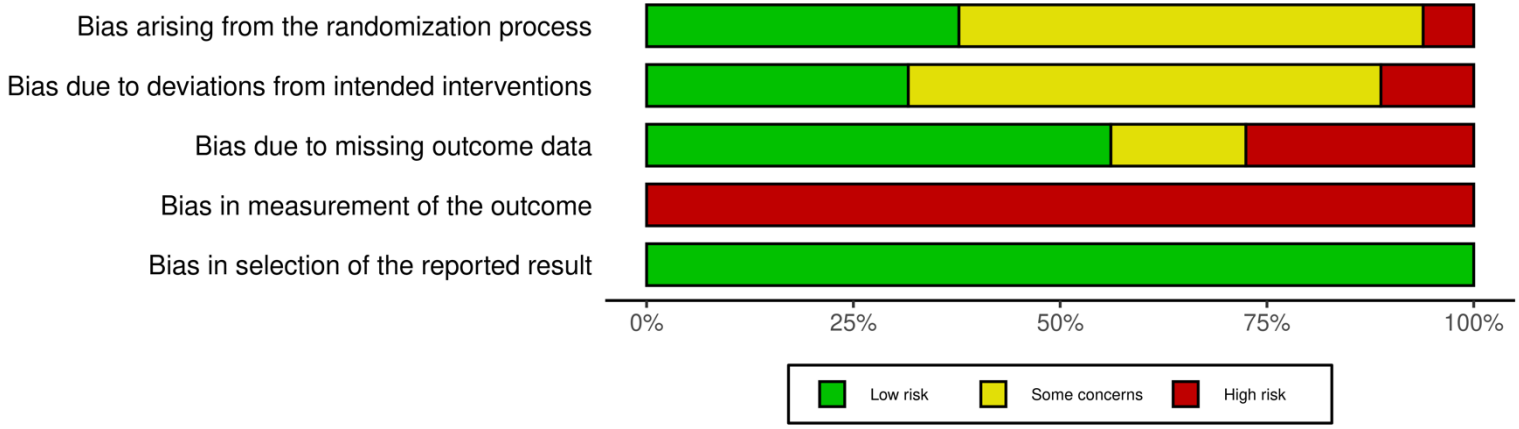

Fig 2.4. Risk of bias graph: each risk of bias domain presented as percentages across all included studies

Chapter 3: Moderators of an Online Parent-Delivered CBT with Remote Therapist Support for Reducing Anxiety in Young Children Identified at Risk of Anxiety Disorders

Introduction

As introduced in Chapter 1 (see the section of *Moderators of GPD-CBT*), therapist-guided, parent-delivered CBT (GPD-CBT) remains a relatively novel approach for child anxiety, only a few studies have evaluated its effectiveness and even fewer have examined its potential moderators. Indeed, only eight out of the 86 trials included in the Chapter 2 review evaluated the effectiveness of GPD-CBT programmes. This small number of GPD-CBT trials included in the Chapter 2 review restricted the generalisability of review findings to this specific form of CBT and also limited the possibility to conduct subgroup or meta-regression analysis to identify potential moderators within GPD-CBT trials. Furthermore, only two of the eight GPD-CBT trials included in the review further explored potential moderators in follow-up studies (Allard et al. 2022; Morgan et al., 2018). However, as noted in the *Moderators of GPD-CBT* section in Chapter 1, the generalisability of the findings from these two studies to other GPD-CBT programmes is limited due to their specific sample and intervention characteristics.

Therefore, there is a clear need for more high-quality individual trials to evaluate the effectiveness of GPD-CBT for child anxiety and to explore factors that may influence its effectiveness. In 2021-2023, Reardon and colleagues conducted a cluster randomised controlled trial in 95 mainstream primary/infant schools in England (*Minimising Young Children's Anxiety through Schools, MY-CATS)* to evaluate the effectiveness of an online parent-delivered CBT programme *(Online Support and Intervention for child anxiety, OSI)* with regular remote therapist support, compared to usual school practice, in minimising anxiety among 865 families with young children (4-7 years) identified at risk of anxiety disorders on the basis of at least one risk factor of child elevated anxiety symptoms, behavioural inhibition, parental elevated anxiety (Reardon et al., 2022). The MY-CATS study offers a valuable opportunity to expand our understanding of factors that may moderate the effectiveness of GPD-CBT programmes for child anxiety, especially those delivered in an

online format, with regular remote therapist supports, and/or for "at-risk" young children identified based on multiple risk factors.

Using quantitative data collected from the MY-CATS study, this chapter examined a broad range of potential moderators that might influence the child anxiety outcomes of the online GPD-CBT programme evaluated in the study, including baseline demographic factors, child baseline anxiety and behavioral inhibition, parental baseline anxiety, parental motivation for engagement at baseline, and child risk profile (types/combinations of risk for anxiety disorders).

Potential moderators

Baseline demographic factors

Many studies have examined the association between child age and CBT effectiveness for child anxiety; however, findings have been inconsistent, and few have focused on GPD-CBT programmes. For example, the meta-analytic review presented in Chapter 2 examined the association between child age and CBT outcomes for the prevention and treatment of anxiety disorders in children and adolescents using subgroup analyses (based on age range) and/or meta-regression analyses (based on mean age), but was unable to draw clear conclusions given the lack of CBT trials for young children (≤ 8 years), the wide age range of participants included in many trials (i.e., the mixed child/adolescent samples), and other potential confounding factors (e.g., age-related measurement issues, intervention characteristics varying by child age). Moreover, as noted above, only 8 of the 86 trials included in the review focused on GPD-CBT, further limiting the generalisability of review findings to this specific approach. Some individual trials have also examined the association between child age and CBT effectiveness for child anxiety, and generally reported no significant association (Knight et al., 2014; Lundkvist-Houndoumadi et al., 2014). However, as most of these studies focused on therapist-led CBT programmes, it is unclear to what extent their findings are applicable to GPD-CBT. In addition, existing evidence on the association between child age and CBT outcomes for child anxiety primarily comes from programmes targeting preadolescent children and adolescents older than 7 years (Knight et al., 2014; Lundkvist-Houndoumadi et al., 2014). Few studies have explored which age groups within early childhood may benefit more from CBT. However, understanding this question is particularly

important, as it can inform the optimising the design and delivery of CBT programmes for younger children, thereby enhancing the effectiveness of early interventions for anxiety disorders and minimising their consequences for children, their families, and society. The MY-CATS study, focusing on a GPD-CBT programme targeting a specific age group of children (4-7 years), offers a unique opportunity to shed light on the moderating role of child age on GPD-CBT outcomes in a narrow age range of early childhood.

In addition to child age, previous studies have also examined the association between CBT outcomes for child anxiety and a broader range of baseline demographic factors (e.g., child gender, child gender, child and parent ethnicity, parent relationship with child, partner cohabiting status, educational level, employment status, and family socioeconomic background), and generally found no significant associations (Knight et al., 2014; Lundkvist-Houndoumadi et al., 2014). But again, most of these studies focused on therapist-led CBT programmes, and their findings may not fully generalise to GPD-CBT programmes. For example, unlike traditional therapist-led CBT, which is delivered by trained mental health professionals, GPD-CBT places the responsibility on parents to implement the intervention at home with only minimal therapist support (e.g., Donovan et al., 2014; McLellan et al., 2024; McLoone et al., 2012; Morgan et al., 2017). In this context, certain family background characteristics may influence parents' engagement with and implementation of the intervention, potentially affecting its effectiveness. Supporting this hypothesis, evidence from broader literature on parent training programmes for early-onset child behavior problems have suggested that certain family demographic characteristics (e.g., single-parent households, low income) are associated with poorer outcomes (Lundahl et al., 2006; Reyno & McGrath, 2006), which may also apply to the online GPD-CBT programme evaluated in the MY-CATS study.

Child baseline anxiety

The meta-analytic review presented in Chapter 2 was unable to draw firm conclusions on the association between child baseline anxiety levels and CBT outcomes for the prevention and treatment of anxiety disorders in children and adolescents, given the limited available data for analysis. However, some previous studies have examined this association within individual CBT trials (Knight et al., 2014; Lundkvist-Houndoumadi et al., 2014). Although most of these studies focused on therapist-led CBT programmes, their findings can still provide some

useful insights for the investigation into the association between child baseline anxiety levels and GPD-CBT outcomes.

Specifically, studies of some CBT *treatment* programmes for childhood anxiety disorders found that greater baseline severity was associated with poorer treatment responses, probably because children and adolescents with very high levels of anxiety may need longer or more intensive interventions, or additional support beyond standard CBT. (Festen et al., 2013; Liber et al., 2010; Southam-Gerow et al., 2001). However, in some other CBT *prevention* and *treatment* programmes for childhood anxiety disorders, children with higher baseline anxiety levels tended to show greater anxiety reduction, probably because those with higher initial severity have more "room for improvement" and/or have more opportunities to practise intervention strategies (Ginsburg et al., 2015; Miller at al., 2011; van Starrenburg et al., 2018; Wergeland et al., 2016). Since the MY-CATS study applies a targeted prevention approach for children identified at risk of anxiety disorders, the latter pattern may be more applicable in its context. This chapter quantitatively examined this hypothesis.

Child baseline behavioural inhibition

Defined as a temperament construct characterised by heightened vigilance to novelty combined with a lack of approach and active avoidance of unfamiliar objects, people, and environments (Kagan et al., 1999), behavioural inhibition is a well-established risk factor for anxiety disorders in childhood (Lahat et al., 2011). Although behavioural inhibition and anxiety symptoms overlap to some extent at the behavioural level (e.g., a tendency to avoid novel situations), they are conceptually distinct constructs (Fox et al., 2023; Shamir-Essakow et al., 2005). Behavioural inhibition is typically measured as an observable behavioural phenotype, reflecting variations in children's reactions to novel contexts, objects, and social situations involving an adult (e.g., stranger approach). Anxiety symptoms, however, comprise a diverse set of phenotypes, all of which involve excessive negative affect characterised by fears and worries.

Evidence suggests that although behavioural inhibition in early childhood is a temperament that can enhance the risk of developing anxiety disorders during late childhood and adolescents, not all children with this temperament go on to develop anxiety disorders (e.g., Clauss & Blackford, 2012). Previous studies have identified many factors that can moderate

the link between early behavioural inhibition and later anxiety disorders. Among these, parenting behaviours are considered key moderating factors that can either facilitate or prevent the development of anxiety disorders in behaviourally inhibited children (Lahat et al., 2001; Degnan et al., 2010; Ryan & Ollendick., 2018). For example, parental overprotection, characterised by parental excessive provision of protection considering the child's developmental level (Holmbeck et al., 2002), has been found to increase the risk of anxiety development in behaviourally inhibited children (Lewis-Morrarty et al., 2012; Vreeke et al., 2013). That may occur because. when parents attempt to "protect" their child by limiting the child's exposure to challenging situations or by helping the child avoid or manage difficult tasks, they may reinforce the child's anxious thoughts (e.g., "the world is dangerous" and "I am not able to cope"), increase the child's avoidant behaviours, and limit opportunities for the child to develop skills and confidence in managing challenging situations (Clark et al., 2013). Similarly, parental accommodation, characterised by parents' modification of their own behaviours to prevent or reduce their child's anxiety when facing anxiety-provoking situations, is also regarded as a factor that maintains or exacerbates anxiety in children (Lebowitz et al., 2013). Parental accommodating behaviours may include enabling or permitting a child's avoidance of anxiety-provoking situations, following rigid rules related to encountering anxiety-provoking stimuli, modifying family routines, and providing excessive reassurance. Although these parenting behaviours can reduce a child's anxiety in the short term, they tend to reinforce avoidance and dependence, thereby preventing the child from developing effective coping ability and efficacy (Ginsburg et al., 2004). Furthermore, it has been suggested that not only can parenting behaviours such as overprotection and accommodation increase the risk of development anxiety disorders in behaviourally inhibited children, but children's inhibited temperament can also elicit overprotective behaviours from parents, creating a reciprocal cycle that reinforces and maintains children's anxiety problems (Perez-Edgar et al., 2021).

Given the established link between early behavioural inhibition and later childhood anxiety disorders, as well as the moderating effects of parenting behaviours, some parenting interventions have been developed to prevent the development of anxiety disorders in children with behavioural inhibition (Morgan et al., 2017; Rapee et al., 2010). These interventions typically included reductions in parental overprotective and accommodation as one of key targets and have demonstrated significant effectiveness in preventing the development of anxiety disorders among behaviourally inhibited children. In the MY-CATS

study, although reducing parental overprotection and accommodation was not an explicit target of the GPD-CBT programme, the parent-focused strategies provided in the intervention, such as supporting parents to help their children gradually test their fears instead of avoiding them, may function as practical alternatives to parental overprotective or accommodating behaviours, thereby preventing the development of anxiety disorders in behaviourally inhibited children. From this perspective, it's possible that children with behavioural inhibition at baseline may benefit more from such an intervention than those without, because they are at greater risk for anxiety development and their parents are more likely to engage in overprotective or accommodating behaviours. This study examined this hypothesis by examining the moderating effect of child baseline behavioural inhibition on the effectiveness of the GPD-CBT programme evaluated in the MY-CATS study.

Parental baseline anxiety

As noted in Chapters one and two, parental anxiety is a well-established risk factor for the development of anxiety disorders in children (Aktar et al., 2013, 2017). There has also been evidence that parental anxiety may *negatively* affect CBT outcomes for child anxiety (Cooper et al., 2008; Kunas et al., 2021). For example, Cooper et al. (2008) examined the impact of maternal anxiety on treatment outcomes (primarily therapist-led child-focused CBT delivered in an individual or group format) in a small sample of children with anxiety disorders and found that children of anxious mothers responded less well to treatment than those of non-anxious mothers. The authors suggested that anxious parents may face greater challenges in supporting their child's therapeutic process, either due to difficulty engaging with treatment or an association between maternal anxiety and parenting behaviours that may increase the risk of child anxiety disorders (e.g., overprotection).

However, not all studies supported the *negative* association between parental anxiety and CBT outcomes for child anxiety (Knight et al., 2014). Some studies found no associations between parental baseline anxiety levels and CBT outcomes for child anxiety (e.g., Cobham et al., 2010; Ginsburg et al., 2015). Legerstee et al. (2008) even found that maternal lifetime anxiety disorders were associated with better outcomes of a therapist-led, child-focused, parent-involved CBT treatment for anxious adolescents. This finding, according to authors, might be because the incorporation of parent-training sessions could help anxious parents enhance the quality of the parent-child relationship and/or enhance the parenting practices.

These positive changes in parents along with the CBT techniques delivered to children may have a synergetic effect on intervention outcomes.

These inconsistent findings in previous studies suggest that the impact of parental anxiety on the CBT outcomes for child anxiety may depend on the content and delivery format of the intervention, especially how parents are involved. The meta-analytic review presented in Chapter 2 sought to explore this possibility by examining whether parental baseline anxiety level moderated the effectiveness of CBT for the prevention and treatment of anxiety disorders in children and adolescents, and whether its moderating effect differed across CBTs with or without content specifically for parents. However, the review was ultimately unable to answer this question, as only 3 out of 86 CBT trials included in the review provided data on parent baseline anxiety levels. Therefore, there is a clear need for more studies to investigate the moderating role of parental anxiety across different forms of CBT, including GPD-CBT.

In GPD-CBT, parents are required to learn and implement intervention strategies independently, with only minimal therapist support. It is unclear whether parents' own anxiety might impair their ability or motivation to learn and implement these strategies, thereby resulting in poorer intervention outcomes. Evidence from broader literature on self-help parent training programmes for child behaviour problems has indicated that higher initial parental psychopathology may be associated with poorer outcomes (Reyno & McGrath, 2006), which may also apply to GPD-CBT for child anxiety. On the other hand, GPD-CBT also provides parent with multiple strategies to help children manage anxiety effectively, which may enhance anxious parents' parenting practices. In this context, parental anxiety may no longer impede intervention outcomes and, as observed in Legerstee et al. (2008), may even be associated with more favourable child outcomes. In light of these perspectives, the present study used quantitative data from the MY-CATS study to explore whether, and in what direction, parental baseline anxiety levels influence the effectiveness of GPD-CBT programmes for child anxiety.

Parental motivation for engagement at baseline

Motivation to engage in a psychological intervention refers to one's acknowledgment of problems, perceived distress, and willingness to face these difficulties (Keijsers et al., 1999;

Westra & Dozois, 2006). Evidence from therapist-led child-focused CBT programmes for child anxiety suggests that children's higher motivation for engagement is associated with better intervention outcomes (Kendall et al., 2009; Kodal et al., 2018; Smith et al., 2017; Wergeland et al., 2016), probably because motivated children are more willing to participate in, and endure, procedures that may cause discomfort (e.g., exposure in CBT protocols) (Keijsers et al., 1999; Westra & Dozois, 2006). However, in GPD-CBT programmes, parents are expected to be the primary implementer of the intervention with minimal therapist support. The extent to which parents are willing to actively engage with the intervention strategies may be crucial to its success. Evidence from some online self-help parent training programmes have suggested that parental engagement levels measured by factors such as the number of modules completed and the frequency of homework practice is closely linked to intervention outcomes (Dittman et al., 2014; Morgan et al., 2018). Given that higher parental motivation likely predicts their greater levels of engagement, it is reasonable to assume that parental motivation for engagement may moderate child anxiety outcomes in the online GPD-CBT programme evaluated in the MY-CATS study.

Child risk profile

The MY-CATS study adopted a "targeted prevention" approach by enrolling young children identified at risk of anxiety disorders based on the presence of at least one of three risk factors: child elevated anxiety symptoms, behavioural inhibition, parental elevated anxiety (Reardon et al., 2022). Although screening for multiple risk factors allows a targeted prevention programme to identify and support a broader range of children and families who may benefit from intervention, it raises an important question: which specific types or combinations of risk factors are associated with greater intervention benefits, or may signal a need for additional support? Few studies have explored this question, as most targeted prevention programmes for childhood anxiety disorders identify "at-risk" children based on a single risk factor (Lawrence et al., 2017; all CBT trials for targeted anxiety prevention included in Chapter 2 review). To address this gap, this chapter examined whether child risk profile, including the presence of one particular risk and specific types/combinations of risks (i.e., child elevated anxiety symptoms, behavioural inhibition, parental elevated anxiety), were related to better or poorer intervention outcomes in the MY-CATS study.

Moderators of child anxiety outcomes at different time points

The online GPD-CBT programme evaluated in the MY-CATS study—*Online Support and Intervention (OSI)* with remote therapist support—consisted of seven online modules released to parents on a weekly basis. Each module was followed by a scheduled telephone or video call with a therapist. While parents/carers were encouraged to complete one module per week, they were also given the flexibility to proceed at their own pace. This flexible delivery format highlights a key consideration: evaluating only short-term outcomes (e.g., at 12 weeks post-randomisation) may not fully capture the intervention's effects, as some families might still be working through the material within the initial weeks and thus may not yet have experienced the full benefits.

To address that, the MY-CATS study assessed child anxiety outcomes at both 12 weeks (child anxiety symptoms) and 12 months (child anxiety symptoms and presence/absence of an anxiety disorder) post-randomisation to capture children's immediate improvement and longer-term gains from the intervention. Examining whether a potential moderator influences child anxiety outcomes at both time points can provide insights into how the moderator may influence the intervention outcomes over time, thereby optimising intervention design and delivery to enhance both immediate improvements and sustained benefits for children and families with diverse needs. Given that, this chapter examined whether the above potential moderators moderated the association between group assignment (intervention vs. usual school practice) and child anxiety outcomes at 12-week post randomisation (anxiety symptom levels) and 12-month post randomisation (children's presence/absence of an anxiety disorder and children's anxiety symptom levels) in the MY-CATS study.

Method

Procedure

Full details of the MY-CATS study procedures have been published (Reardon et al., 2022). In brief, the MY-CATS study recruited participants from Reception, Year 1, Year 2 classes of 95 mainstream primary/infant schools in England. A family was eligible for MY-CATS if (1) at least one child aged 4-7 years screened positive on the basis of at least one risk factor of child elevated anxiety symptoms, behavioural inhibition, parental elevated anxiety symptoms, and (2) at least one parent/carer had sufficient use of English to provide consent, complete measures, and/or take part in the intervention and was able to access to the internet, either at

home or elsewhere. Eligible families who consented to participate in the trial and completed the baseline assessment were randomised to the intervention or control arm at the school (cluster) level in a 1:1 ratio. The randomisation was conducted by an independent statistician via a computer-generated algorithm, taking account of the balance between the intervention and control groups in terms of school deprivation level (above/below national average of 15.8% for percentage of pupils eligible for free school meals)[1] and the number of recruited children in each school (cluster size)[2]. Families in schools allocated to the intervention arm were offered an online parent-delivered CBT programme *(Online Support and Intervention for child anxiety, OSI)* with remote therapist support. Schools in both arms continued to provide usual support for children and parents throughout the trial. Assessment occurred at the screening stage to determine eligibility, as well as at baseline (pre-randomisation), and 6 weeks, 12 weeks, and 12 months post-randomisation.

Participants

All participants (N=865) randomised to the intervention (n=434) and control (n=431) groups were included in this study. Children's age at baseline ranged from 4 to 7 years (*M*=6.2, *SD*=0.9). Number of children from Reception, Year 1, Year 2 were 254, 297, and 314, respectively (49.9% female, 50.1% male). Most primary participating parents/carers in the MY-CATS study were children's mothers (92.8%). Parents/carers' ages ranged from 21 to 64 years (*M*= 36.9, *SD*=5.5). The majority of children and parents/carers were white British (81.7% of children, 80.9% of parents/carers)[3]. Most parents/carers cohabited with their partner (83.9%). More than half of the parents/carers had an undergraduate degree or above (57.7%)[4]. Parent/carer's employment status varied: 32.5% were employed full-time, 38.7% were employed part-time, 22.5% were unemployed (including homemakers, retirees, students), 5.3% were others. The index of multiple deprivation (IMD)[5] of participating

1 Free school meals (FSM) in the UK provide eligible students with a daily healthy school meal at no cost. This initiative supports children from low-income families. National average FSM in 2019 = 15.8%. In MY-CATS, the percentage of children eligible for free school meals in 50 out of the 95 participating schools was below the national average of 15.8%.
2 In MY-CATS, the number of participating children recruited from each school (cluster size) ranged from 1 to 24.
3 According to the 2021 Census, 81.7% (48.7 million) of usual residents in England and Wales identified their ethnic group within the high-level "White" category (The Office for National Statistics, 2021).
4 According to the 2021 Census, 33.8% adults in England and Wales had a Level 4 or above qualification, which includes undergraduate degrees, totaling 16.4 million people (The Office for National Statistics, 2021).
5 The Index of Multiple Deprivation (IMD) is a measure of relative deprivation for small, fixed geographic areas of the UK. The Indices are calculated based on seven different domains, or facets, of deprivation:

families varied from 1 (the bottom 10% of the most deprived areas) to 10 (the top 10% of the least deprived areas), with 16.8% families from the bottom 20% of the most deprived areas in UK. Children's risk profiles identified at the screening stage is presented in Table 3.1.

[Insert Table 3.1 here]

Intervention

The online parent-delivered CBT intervention with remote therapist support for young children (4-7 years) provided in the MY-CATS study was OSI (Online Support and Intervention for child anxiety) with remote therapist support, adapted for younger children from a version which was originally designed for parents of children aged 7-12 with anxiety disorders (Hill et al., 2022b). It comprised seven online modules that were released for parents weekly after the completion of call with a therapist. Each online module took approximately 20 minutes to complete. The content of each module is shown in Table 3.2.

[Insert Table 3.2]

For each child, OSI required the participation of one parent/carer as primary implementer, while an "observer" account was available for any other adults (e.g., second parent/carer or teacher) to see the online content. After the welcome module, each OSI module gave parents tasks to practise with their child over the next week. Each module was supported by a brief weekly telephone/video call (approximately 20 min) with a Children's Wellbeing Practitioner (CWP; NHS band 5 graduate psychological therapists trained to deliver low intensity psychological therapies for children and young people with anxiety problems, low mood, and behavioural problems), and a follow-up review telephone/video call 4 weeks later. In these telephone/video call sessions, parents were supported (following structured and standardised guidance for CWPs) to develop their understanding of the OSI content, access support in personalising the content for their child, and have help with problem-solving any challenges that may have arisen. All CWPs received weekly supervision from a clinical psychologist following initial training in the therapist-guided parent-delivered CBT approach generally and OSI specifically.

---

income deprivation, employment deprivation, education, skills and training deprivation, health deprivation and disability, crime, barriers to housing and services, living environment deprivation. Families in MY-CATS were categorised into 10 ordinal categories based on their indexes of multiple deprivation (IMD), ranking from 1 (families from the bottom 10% of the most deprived areas in UK) to 10 (families from the top 10% of the least deprived areas in UK).

Parents/carers were encouraged to complete one module per week but with flexibility to work at their own pace if they preferred. By 12-month post-randomisation, 317 of the 434 parents (73.0%) completed all the online modules, 319 parents (73.5%) completed all the telephone/video calls with their CWP following each online module, and 308 parents (71.0%) completed the follow-up review call.

Measures

Moderator measures

Child and family demographic factors at baseline: Parents/carers reported a wide range of demographic information at baseline via online questionnaires. I examined the moderating effect of the following variables (all coded as categorical variables): child year group (Reception versus Year 1 versus Year 2); child gender (female versus male versus others); child and parent/carer ethnicity (White British versus others); parent/carer's relationship with child (mother versus father versus others); parent/carer partner cohabiting status (cohabiting with a partner or not); parent/carer education level (having an undergraduate degree or above or not); parent/carer employment status (full-time employed or not); family socioeconomic background measured using index of multiple deprivation score (bottom quintile of the IMD versus remaining four quintiles).

Parental motivation for engagement at baseline: Parents/carers reported their motivation to engage with an online and telephone support programme at baseline (before randomisation) via a 5-point (1-5) online questionnaire designed for the MY-CATS study. The questionnaire evaluated parent/carer's agreement on 6 statements related to perceived benefits of the programme (e.g., 'I expect my family would benefit from the online and telephone support programme'), potential concerns (e.g., 'I am afraid the online and telephone support may take up too much time'), and motivation to use acquired skills ('I am motivated to use the skills that we would learn from the programme'). The sum score of the six statements were calculated, with higher scores representing a higher level of motivation. The questionnaire demonstrated an acceptable internal consistency reliability at baseline (*Cronbach's a* value=0.62). According to the distribution of parent/carer's scores on this questionnaire at baseline, I coded parental motivation for engagement as a categorical moderator: a sum score ≥24/30 indicates parents/carers with high motivation.

Child and parent mental health status at baseline*:* Parents/carers completed the online versions of the 28-item Preschool Anxiety Scale (PAS, each item scored 0-4, Spence et al., 2001), the 7-item approach subscale of the Short Temperament Scale for Children (STSC-A, each item scored 1-6 with 4 reverse items, Prior et al., 1987; Sanson et al., 1996), and the 7-item Generalised Anxiety Disorder Scale (GAD-7, each item scored 0-3, Spitzer et al., 2006) at baseline to rate their child's anxiety symptoms, behavioural inhibition, and their own anxiety levels. Sum scores were calculated for each scale, with higher scores indicating higher levels of child anxiety symptoms, behavioural inhibition, and parent anxiety. The PAS, STSC-A, GAD-7 all showed good internal consistency reliabilities at baseline (*Cronbach's a* value=0.89, 0.87, 0.89, respectively). Based on the established cut-off scores in previous studies, I coded children's anxiety symptoms, behavioural inhibition, and parent/carer anxiety level at baseline as three categorical moderators: a PAS sum score ≥34/112 indicates child elevated anxiety symptoms (Spence et al., 2001), a STSC-A sum score ≥ 30/42 indicates child behavioural inhibition (Bayer et al., 2018; Rapee et al., 2005), a GAD-7 sum score ≥ 8/21 indicates parent/carer elevated anxiety (Kroenke et al., 2007).

Risk profile: The PAS, STSC-A, and GAD-7 were also used to identify "at-risk" children for anxiety disorders at the screening stage of MY-CATS study, and all showed good internal consistency reliabilities (*Cronbach's a* value=0.87, 0.86, 0.88, respectively). All randomised children screened positive for at least one of three risk factors: child elevated anxiety symptoms (PAS sum score ≥34), child behavioural inhibition (STSC-A sum scale ≥30), or parent elevated anxiety (GAD-7 sum score ≥ 8) (Reardon et al., 2022). To examine whether types of risk moderate intervention effectiveness, I examined whether the presence of a specific risk factor moderated the intervention effectiveness, and whether children with different single risks benefited differently (when sufficient data were available). To understand whether combinations of risks may moderate intervention effectiveness, I examined whether adding a risk factor to another single risk factor or to a combination of the other two risk factors changed the intervention effectiveness (when sufficient data were available).

Outcome measures

Child anxiety diagnosis outcome at 12 months post-randomisation: At the 12-month assessment, psychology graduates (blind to trial arm status and trained to a high level of

inter-rater reliability) assessed for child anxiety disorders using the Anxiety Disorder Schedule-Child Version-Parent Interview (ADIS-P) (Silverman et al., 1996) via telephone/video call (Lyneham, & Rapee., 2005). Diagnoses and Clinical Severity Ratings (CSRs) were assigned based on the parent interview following standard guidelines. Diagnoses and CSRs 4–8 was assigned if a child met the diagnostic criteria, and CSRs 0–3 was used to assign sub-clinical diagnoses. Whether the child met diagnostic criteria for at least one anxiety disorder with a CSR of ≥4 at 12-month post-randomisation was analysed as a binary outcome.

Child anxiety symptoms at 12 weeks and 12 months post-randomisation: Parents/carers completed the online version of PAS at 12 weeks and 12 months post-randomisation. Children's PAS sum scores at 12 weeks and 12 months post-randomisation were analysed as continuous outcomes in this study. The PAS showed good internal consistency at both 12-week and 12-month time points (*Cronbach's a* value=0.93, 0.92, respectively).

School-level demographic information for model adjustment: The MY-CATS study collected school-level demographic information from the Department for Education website, including percentage of pupils eligible for free school meals. Since the randomisation process of MY-CATS considered the balance between the intervention and control groups in terms of school deprivation level measured as free school meal status (above/below national average of 15.8% for percentage of pupils eligible for free school meals in UK) and the number of recruited children in each school (cluster size), I included free school meal status as a binary variable and cluster size as a continuous variable in all statistical models for adjustment to reflect their roles in the randomisation process.

Data analysis

Statistical models for moderation analysis. To examine potential moderators of the binary outcome of the intervention (child anxiety diagnosis at 12 months post-randomisation), I employed a marginal model using Generalised Estimating Equation with robust estimates of the standard error for each potential moderator. This model accounted for the correlation between responses within the same school (cluster) by specifying an exchangeable correlation structure. To examine potential moderators of the continuous outcomes (child anxiety symptoms at 12 weeks and 12 months post-randomisation), I employed a mixed

effects linear regression model for each potential moderator. This model incorporated random effects at the school (cluster) level to account for the correlation between responses within the same school (cluster).

To enhance the interpretability of the study results, all potential moderators in this study were coded as categorical variables with *k* levels (categorisation method are detailed in the Measures section). To facilitate moderation analysis, they were further coded as *k-1* dummy variable (s) with one level as reference. Therefore, the model for a specific potential moderator included a dummy variable for group allocation (intervention=1, usual school practice=0), dummy indicator(s) for the potential moderator, and interaction terms(s) between group allocation and all dummy variables for the potential moderator. All models were adjusted for school-level free school meal status (binary variable) and cluster size (continuous variable) to reflect their roles in the randomisation process. Child baseline anxiety symptom level (i.e., PAS sum scores) was also controlled for as a continuous variable, except when a model already included a dummy variable indicating child anxiety symptom level at the screening stage or baseline to avoid multicollinearity.

All models were run in R software 4.1.1 ("geepack" "lme4" package). A moderating effect was considered to exist if the interaction term(s) between the potential moderator and group assignment were statistically significant ($p<0.05$). To enhance interpretation, the intervention effect in each subgroup was quantified using odds ratio (binary outcome) and mean difference (continuous outcomes) alongside 95% Cis, adjusted for child baseline anxiety symptom levels, school-level free school meal status and cluster size. To ensure statistical power, subgroups with small sample size (<30) were excluded from the analysis.

Missing data. The primary moderation analyses in this chapter were conducted following the intention-to-treat principle, including all participants randomised to the intervention and control groups in MY-CATS study. Missing data were handled using a multiple imputation approach. Prior to imputation, a "scaling up" process was applied. Specifically, if a participant did not complete all items of a multi-item measure, the missing items were estimated based on the average score of the non-missing items for the participant. Each measure had a minimum threshold for the number of completed items required to validly extrapolate the total score (see Appendix 2). If the number of completed items fell below this threshold, the participant's data for that measure was considered missing.

After applying the "scaling up" process, 243 out of the 865 (28.09%) randomised children did not have data on the absence/presence of an anxiety disorder at 12 months post-randomisation, 154 children (17.80%) did not have data on anxiety symptoms at 12 weeks post-randomisation, and 230 children (26.59%) did not have data on anxiety symptoms at 12 months post-randomisation. A small amount of missing data was also found in following potential moderators: child and parent/carer ethnicity, parent/carer partner status, education level, employment status, and motivation for engagement, with missing cases ranging from 4 to 54.

Attrition analyses, using chi-square tests, were conducted for the three child anxiety outcomes (i.e., child anxiety symptom outcomes at 12 weeks and 12 months, child diagnosis outcome at 12 months). Attrition rates on all three child anxiety outcomes were similar between the intervention and usual school practice groups in the overall sample and most moderator-defined subgroups. Exceptions were observed in several subgroups: lower attrition in the intervention group was observed among reception children (child anxiety symptom outcome at 12 weeks) and children with fathers as the primary participating parent/carer (child anxiety symptom outcome at 12 weeks and 12 months); higher attrition in the intervention group was observed among children without elevated anxiety symptoms at baseline (child anxiety diagnosis and anxiety symptom outcome at 12 months) and among children who screened negative on elevated anxiety symptoms at the screening stage (child anxiety symptom outcome at 12 months). No significant associations were found between attrition rates and most potential moderators. Exceptions included greater attrition on all three outcomes among parent/carers who were not cohabiting with a partner, had lower education level, screened positive on elevated anxiety themselves at baseline and/or the screening stage, compared to those who were cohabiting with a partner, had an undergraduate degree or above, screened negative on elevated anxiety themselves at baseline and/or the screening stage.

All missing data was imputed in R software 4.4.1 ("jomo" "mitml" package), using a joint modelling multiple imputation approach based on a multivariate linear mixed effects model accounting for clustering in the data by including random effects at the school level. To improve imputation accuracy and reduce biases in subsequent moderation analysis, the imputation model included group allocation, all child anxiety outcomes and potential

moderators, and variables for model adjustment. Children's anxiety symptom levels at baseline, 12 weeks and 12 months post-randomisation, and school-level cluster size were included in the imputation model as continuous variables. Other variables were included in the imputation model as dummy-coded categorical variables, and for those with missing data, imputation will be conducted on their dummy variable(s). A total of 50 imputed data sets were generated, and the results of identical analysis on each imputed data set were combined using Rubin's rules (Little & Rubin, 2002).

While the primary moderation analyses were conducted on imputed data, I also ran each moderation model using only cases with complete data for all variables involved (i.e., complete case analyses) to examine sensitivity of the findings to the handling of missing data. The results of complete case analyses were only reported if they were inconsistent with the results of intention-to-treat analyses.

Results

Moderators of child anxiety symptom outcomes at 12 weeks and 12 months post-randomisation

Intention-to-treat analyses indicated a significant interaction between child year group (reception vs. year 2) and group assignment on anxiety symptom outcomes at both 12 weeks (p=0.04) and 12 months post-randomisation (p=0.02) (see Table 3.3). As shown in Table 3.4, after adjusting for children's baseline anxiety symptom levels, school-level free school meal status and cluster size, the intervention group showed significantly lower anxiety symptoms compared to the usual school practice group at 12 weeks in both reception and year 2 children. However, the adjusted mean difference in year 2 children (-10.19, 95%CI = -13.18 to -7.21, p<0.001) was larger than that in reception children (-5.97, 95%CI = -9.00 to -2.94, p<0.001). At 12 months, the intervention group continued to show significantly lower anxiety symptoms compared to the usual school practice group in year 2 children (adjusted mean difference = -8.77, 95%CI = -12.28 to -5.25, p<0.001); however, the adjusted mean difference in anxiety symptoms between the intervention and usual school practice groups was no longer significant in reception children (adjusted effect size =-3.11, 95%CI = -6.65 to 0.44, p>0.05).

[Insert Table 3.4]

Intention-to-treat analyses identified no other significant interaction effects on child anxiety symptom outcomes at 12 weeks or 12 months post-randomisation (see Table 3.3). As shown in Table 3.4, after adjusting for children's baseline anxiety symptom levels, school-level free school meal status and cluster size, the intervention group showed significantly lower anxiety symptoms compared to the usual school practice group at both 12 weeks and 12 months in most subgroups. However, this was not the case for the subgroups of non-White British children, children of non-White British parents/carers, children whose father (rather than mother) was the primary participating parent/carer, children identified at risk of anxiety disorders based on behavioural inhibition only, and children identified at risk based on all three risk factors.

Results of complete-case analyses for the moderators of anxiety symptom outcomes at 12 weeks and 12 months (see Appendix 3.1 and 3.2) were highly consistent with the results of intention-to-analyses. One exception was the interaction between group assignment and child risk profile (child elevated anxiety only vs. parent/carer elevated anxiety only) on child anxiety symptoms at 12 weeks, which was not statistically significant in the intention-to-treat analyses but reached significance in the complete-case analyses (p=0.04). After adjusting for school-level free school meal status and cluster size, the intervention group showed significantly lower anxiety symptoms compared to the usual school practice group in both subgroups. However, the adjusted mean difference in children identified at risk due to child elevated anxiety symptoms only (-10.54, 95%CI = -13.39 to -7.69, p<0.001) was significantly larger than in children identified as at risk due to parent/carer elevated anxiety only (-6.05, 95%CI = -9.40 to -2.69, p=0.001). Another exception was the interaction between child baseline anxiety symptoms and group assignment, as well as the interaction between parent/carer motivation for engagement and group assignment, on child anxiety symptoms at 12 weeks approached statistical significance in the complete-case analyses (p = 0.06). After adjusting for school-level free school meal status and cluster size, the intervention group showed significantly lower anxiety symptoms compared to the usual school practice group in all subgroups. However, the adjusted mean differences were larger for children with elevated anxiety symptoms at baseline (-10.02, 95%CI = -12.25 to -7.08, p<0.001) and for children whose parents/carers were highly motivated (-9.91, 95%CI = -13.04 to -6.81, p<0.001) compared to children without elevated anxiety symptoms at baseline (-5.15, 95%CI = -7.54 to -2.76, p<0.001) and children whose parents/carers were not highly motivated parents (-7.04, 95%CI = -9.19 to -4.90, p<0.001), respectively.

Moderators of child anxiety diagnosis outcomes at 12 months post-randomisation

Intention-to-treat analyses indicated no significant interactions between candidate moderators and group assignment on child anxiety diagnosis outcomes at 12 months post-randomisation (see Table 3.3). As shown in Table 3.5, after adjusting for children's baseline anxiety symptom levels, school-level free school meal status, and cluster size, the intervention group showed lower anxiety diagnosis rate compared to usual school practice group in all subgroups, despite the adjusted odd ratio reached statistical significance only in two subgroups (i.e., female children and White British children).

[Insert Table 3.5]

Results of complete-case analyses for the moderators of anxiety diagnosis outcomes at 12 months (see Appendix 3.3) were also highly consistent with the results of intention-to-analyses. The only exception was a significant interaction between child year group (reception vs. year 2) and group assignment. Although the intervention group showed a lower anxiety diagnosis rate compared to usual school practice group in both year subgroups, the between-group difference was significantly greater in Reception children (adjusted odds ratio = 0.13, 95% CI = 0.02 to 1.06, p = 0.06) than in Year 2 children (adjusted odds ratio = 0.92, 95% CI = 0.42 to 2.01, p=0.83).

Discussion

This chapter examined the moderating effect of a broad range of child and parent characteristics on the effectiveness of an online GPD-CBT programme in preventing anxiety disorders and reducing anxiety symptoms among 865 young children (4-7 years) identified as at risk of anxiety disorders on the basis of at least one risk factor of child elevated anxiety symptoms, behavioural inhibition, or parental elevated anxiety. The findings of this chapter can help identify who benefited more from the intervention and who may need additional support.

Child initial anxiety severity

Findings suggested that the intervention showed significantly greater effect in reducing child anxiety symptoms at 12 weeks post-randomisation among children with elevated anxiety symptoms before the intervention than among those without. Specifically, complete-case analyses showed that at 12 weeks post-randomisation, the intervention was significantly more

effective in reducing child anxiety symptoms among children identified as at risk due to elevated child anxiety symptoms alone at screening compared to those identified as at risk due to elevated parent/carer anxiety alone, and was also more effective in children with elevated anxiety symptoms at baseline than in those without, with the difference approaching statistical significance. These findings are consistent with some previous preventive trials in which children with higher initial anxiety symptoms tended to experience greater intervention gains, probably because they had more "room for improvement" (e.g., Ginsburg et al., 2015; Lock & Barrett, 2003). In addition, as most strategies introduced in the online GPD-CBT programme evaluated in the MY-CATS study were designed to help parents/carers manage child anxiety, parents/carers of children with elevated anxiety symptoms may have found the content more relevant and thus engaged more effectively.

However, this does not necessarily mean that the intervention, when used as a targeted prevention approach, should be limited to children with elevated anxiety symptoms. Despite the differences noted above, both intention-to-treat and complete-case analyses suggested that the intervention showed positive effects at both 12 weeks and 12 months post-randomisation in preventing anxiety disorders and reducing anxiety symptoms compared to usual school practice among children identified as at risk of anxiety disorders due to parent/carer elevated anxiety alone and among children without elevated anxiety symptoms at baseline. Furthermore, no significant differences in intervention effects were found across other risk subgroups, with positive effects observed in most subgroups. These findings support the intervention as a promising targeted preventive approach for children identified as at risk of anxiety disorders based on multiple risk factors (i.e., child elevated anxiety symptoms, behavioural inhibition, and parental elevated anxiety).

Child age

Findings also indicated that child age moderated the intervention effects in both preventing anxiety disorders and reducing anxiety symptoms; however, the moderating patterns differed across two outcomes. Specifically, both intention-to-treat and complete-case analyses indicated that, although the intervention significantly reduced anxiety symptoms in all age groups compared with usual school practice at both 12 weeks and 12 months post-randomisation, the intervention effect was significantly greater in Year 2 children (aged 6-7 years) than in Reception children (aged 4-5 years) at both time points. This may be because

Year 2 children entered the MY-CATS study with higher baseline anxiety symptoms than Reception children (see Table 3.4). The higher starting point meant that Year 2 children had more room for symptom reduction than Reception children.

In contrast, complete-case analyses showed that the intervention had a significant greater effect in preventing anxiety disorders at 12 months in Reception children than in Year 2 children. One possible explanation for this inconsistency is that the anxiety symptom severity is measured on a continuous variable, whereas the diagnosis of anxiety disorders is determined by a threshold-children must meet a certain level of anxiety severity and associated functional impairments to receive a diagnosis. As such, for children with higher baseline symptoms, even substantial reductions after the intervention may not be sufficient to bring them below the diagnostic threshold. Conversely, children with initially low anxiety levels may be more likely to remain below the threshold with the support of the intervention. In the MY-CATS study, Year 2 children entered with higher baseline anxiety symptoms than Reception children, meaning a greater proportion of Year 2 children may have already been close to or above the diagnostic threshold at baseline. Although the intervention substantially reduced their symptoms, Year 2 children in the intervention group still ended up with a higher anxiety diagnosis rate than reception children across both groups, and the intervention effect on preventing anxiety disorders in this age group was relatively smaller. In contrast, Reception children began with lower anxiety symptoms, and the intervention may have enhanced their ability to manage anxiety-provoking situations. Consequently, very few Reception children in the intervention group developed an anxiety disorder by the 12-month follow-up (1.15% according to complete-case analysis), leading to a significant intervention effect in prevention anxiety disorders. These findings suggest that intervention is effective in reducing anxiety symptoms among children aged 4-7 years and shows particular promise for preventing anxiety disorders in younger children (aged 4-5 years). This is an encouraging finding, as intervening early before anxiety difficulties become ingrained might help minimise their consequences for children, their families, and society.

Parental motivation for engagement

The results of complete-case analyses suggested a moderating effect that approached significance of parental motivation for engagement on intervention effect in reducing child anxiety symptoms at 12 weeks, with higher parental motivation associated with greater

effects. Consistent with my initial hypothesis, this result may be because highly motivated parents/carers are more likely to actively engage with the intervention, practise intervention strategies more frequently, and may be more willing to persist. However, this result should be interpreted with caution given the potential confounding effect of initial child anxiety levels. In the MY-CATS study, children whose parents were highly motivated had higher initial anxiety symptoms than children whose parents were less motivated. This is not surprising, as parents of children with more severe anxiety difficulties may feel a greater need for support and be more eager to help their children by engaging with the intervention. However, this potential association between parental motivation for engagement and child baseline anxiety makes it difficult to disentangle their individual impacts on intervention outcomes.

Lessons from "non-significant" moderators

Apart from the identified moderation effects discussed above, no evidence was found for the moderating effects of other child and parent characteristics on intervention outcomes, including child gender, child baseline behavioural inhibition, child and parent/carer ethnicity, parent/carer relationship to the child, cohabitation status, education level, employment status, and family socioeconomic status, parent baseline anxiety levels, and most risk subgroups (除了 the significant difference… between. ….). These findings may be encouraging, as they may suggest that the online GPD-CBT programme evaluated in the MY-CATS study could be an appropriate anxiety prevention approach for families of "at-risk" young children across diverse child and parent characteristics. When contextualised within the prior literature, some of these results differ from findings from some self-help parent training programmes targeting early-onset child behaviour problems, where parental psychopathology, single-parent status, lower family SES/income were related to poorer outcomes (Lundahl et al., 2006; Reyno & McGrath, 2006). One possible explanation is that certain elements of the online GPD-CBT programme evaluated in the MY-CATS study may have addressed challenges related to those factors, thereby facilitating the success of the intervention. Further investigation into this possibility could provide valuable insights for optimising the design and delivery of future GPD-CBT programmes to address similar challenges for intervention success.

Nevertheless, the lack of evidence for some moderators should be interpreted with caution due to the small sample sizes of certain subgroups. Specifically, most participating children

and parents/carers were White British (81.7% of children; 80.9% of parents/carers), while non-White British children and families only represented 17.8% of the total sample. The majority of primary participating parents/carers in the MY-CATS study were mothers (92.8%), while fathers accounted for only a small proportion (5.9%). Additionally, several risk profile subgroups had relatively small sample sizes compared to others (e.g., behavioural inhibition only, n = 39; all three risk factors, n = 95). The small sample sizes of these subgroups may have reduced the statistical power to detect meaningful intervention effects within those subgroups and capture relevant moderation effects. For example, this chapter found no evidence for the moderating role of child and parent/carer ethnicity on intervention outcomes. However, both intention-to-treat analysis and complete-case analyses showed that the intervention showed significant effect in reducing child anxiety symptoms at both 12 weeks and 12 months post-randomisation compared to the usual school practice group in White British children and children of White British parents/carers, but this was not the case for non-White British children and children of non-White British parents/carers. These results may reflect either insufficient statistical power to detect meaningful effects within the ethnic minority families, or the potential moderation effect of ethnicity that were not identified due to small sample size.

Caution is also needed when interpreting the non-significant moderating effects of child baseline behavioural inhibition and parental baseline anxiety, given the potential confounding effects. Specifically, since the MY-CATS study identified children as being at risk of anxiety disorders based on at least one of three risk factors (child elevated anxiety, child behavioural inhibition, or parental elevated anxiety), a child who screened negative on one risk factor must have screened positive on one or both of the remaining two. This interdependence among the three risk factors established at the screening stage likely persisted through the baseline assessment, making it difficult to disentangle the moderating effects of these three baseline factors on intervention outcomes. Moreover, these variables were inherently interrelated. For instance, as shown in Table 3.1, at the screening stage, very few children were identified as being at risk of anxiety disorders based solely on behavioural inhibition (n = 39) or on the combination of behavioural inhibition and parental elevated anxiety. The majority of children who screened positive for behavioural inhibition also showed elevated anxiety symptoms (n = 209). Consequently, a large proportion of children with behavioural inhibition at baseline might also have elevated anxiety symptoms.

It is also interesting to note that aside from the moderating effect of child age, all significant moderation effects identified in this study was limited to intervention outcomes in reducing child anxiety symptoms at 12 weeks post-randomisation. Several reasons may help explain the lack of evidence for moderation effects on intervention outcomes in reducing child anxiety symptoms or preventing anxiety disorders at 12 months. Firstly, children assigned to the usual school practice group in the MY-CATS study also experienced a reduction in anxiety symptoms over time. This natural recovery effect appeared particularly evident by the 12-month follow-up, which resulted in a relatively smaller intervention effect in reducing child anxiety symptoms compared to the usual school practice group at that time point, making it difficult to detect moderation effects. Furthermore, the presence or absence of an anxiety disorder was binary outcome, which may lack the sensitivity to detect subtle variations in anxiety severity among participants, making it difficult to identify moderators. In addition, since the MY-CATS study targeted children who were at risk for developing anxiety disorders rather than rather than those with current anxiety disorders, relatively few children met diagnostic criteria for an anxiety disorder at 12 months regardless of group assignment (6.8% in the intervention group vs. 11.5% in the usual school practice group). This low incidence of anxiety disorders across study samples reduced the statistical power to detect significant intervention effects in preventing anxiety disorders, as well as moderation effects on this outcome.

Strengths and limitations

This chapter presented a quantitative study examining a broad range of moderators of the child anxiety outcomes of the online GPD-CBT programme evaluated in the MY-CATS study. The following sections outlined the strengths and limitations of this study in terms of study sample, examined moderators, outcomes of interest, and methods for moderation analysis.

Study sample

The large sample size included in the MY-CATS study (n = 865) enhanced the reliability of the findings. However, as noted earlier, sample sizes were limited in certain subgroups (e.g., families from non-White British background, children whose father was the primary participating parent/carer, children identified at risk of anxiety disorders based on behavioural inhibition only or all three risk factors of child elevated anxiety symptoms, behavioural

inhibition, and parental elevated anxiety), which may have reduced the statistical power to detect meaningful intervention effects in these subgroups or identify relevant moderation effects. Future research is needed to better understand the experiences of these subgroups with the intervention.

Examined moderators

Although this chapter examined a broad range of potential moderators, as a secondary data analysis of the MY-CATS study, it was limited to examining potential moderators that were measured in the original dataset. Previous studies have identified some other potential moderators in other GPD-CBT programmes (access to a printer, Morgan et al., 2018; types of anxiety symptoms, Allard et al., 2022), and more broadly, in other forms of CBT for child anxiety (e.g., child motivation for engagement, Kodal et al., 2018; Wergeland et al., 2016). In addition, information regarding the neurodiversity of participating children (e.g., autism spectrum conditions, ADHD) was not collected, which limited my ability to examine the effectiveness of the intervention among neurodivergent children or to compare their outcomes with those of other participating children. Future research should examine other potential moderators that may influence the effectiveness of GPD-CBT for child anxiety. Qualitative studies could also provide valuable insights by identifying novel moderators based on participants' experiences.

Outcomes of interest

This chapter examined moderators of two types of child anxiety outcomes in the GPD-CBT programme evaluated in the MY-CATS study: (1) the presence or absence of an anxiety disorder assessed by independent researchers, and (2) parent/carer-reported child anxiety symptom levels. Each outcome type has its strengths and limitations. Specifically, as a continuous variable, child anxiety symptom outcomes were likely more sensitive to subtle variations in anxiety severity among participants, enhancing the likelihood of detecting moderation effects. However, child anxiety symptom outcomes in the MY-CATS study were assessed using a parent-reported scale (i.e., the Preschool Anxiety Scale, PAS, Spence et al., 2001), which may introduce reporter-related biases. Firstly, anxiety symptoms are internalising experiences that can be elusive to others. Parents need to look for their children's observable behaviours, as described in the PAS items, that indirectly reflect anxiety symptoms, but such behaviours may not always be readily noticeable in everyday life

(Mesman & Koot, 2000). Secondly, certain parental characteristics may have increased the risk of bias in parent-reported child anxiety symptoms. For example, evidence suggests that parents with elevated anxiety may be more sensitive to, and more likely to perceive, potential signs of anxiety in their children, which may affect the measurement invariance of the PAS between children of anxious and non-anxious parents (Francis, 2014; Zhou et al., 2024), thereby reducing the certainty of findings of this study regarding the moderating role of parental anxiety on parent-reported child anxiety symptom outcomes of the intervention. Furthermore, parents in the intervention group may have interpreted and responded to the PAS items differently because of their exposure to the intervention content, thereby reducing measurement invariance between the intervention and control groups. In addition, several potential moderators (e.g., child anxiety symptoms at screening and baseline, parental motivation for engagement) were also measured using parent-reported scales, which may increase the risk of common method bias. Anxiety diagnosis outcomes assessed by independent researchers may be less affected by these reporter-related biases. However, as a binary outcome, child anxiety diagnosis outcomes might lack the sensitivity to detect subtle variations in anxiety severity among participants, thereby limiting the ability to identify moderators. In addition, as noted earlier, applying a targeted prevention approach, relatively few children in MY-CATS study met diagnostic criteria for an anxiety disorder at 12 months regardless of group assignment. This low incidence of anxiety disorders across study samples could reduce the statistical power to detect intervention effects in preventing anxiety disorders, as well as moderation effects on this outcome.

This study also examined potential moderators of the intervention's effect in reducing child anxiety symptoms at both 12 weeks and 12 months post-randomisation, which allowed investigation into whether these moderators might influence the immediate effects of the intervention or/and its sustained benefits over the first year. However, due to the absence of longer-term follow-up data (beyond 12 months), this chapter was unable to identify factors that may affect the long-term maintenance of intervention effects. Future research is needed to explore this question further in order to inform strategies for enhancing the long-term impact of the intervention.

Methods for moderation analysis

This study included a non-active control group (i.e., usual school practice) in the moderation analyses, which allowed for more rigorous testing of whether the moderators of interest genuinely influence intervention outcomes after accounting for natural developmental changes and external influences over time. As discussed earlier, children assigned to the usual school practice group in the MY-CATS study also experienced a notable reduction in anxiety symptoms by the 12-month follow-up, suggesting a certain degree of natural recovery over time. It is important to account for such natural recovery in the data analyses, as failing to do so could confound the assessment of the intervention's true effects and compromise the accuracy of the moderation analyses.

This study reported moderation analysis results using both intention-to-treat and complete-case approaches, which enabled sensitivity testing regarding the handling of missing data in the intention-to-treat analyses through multiple imputation. Although most moderation analysis results were consistent across the two approaches, all evidence of moderation effects, except for the moderating effect of child age, was identified only in the complete-case analyses. One possible explanation is that the use of multiple imputation to handle missing data in the intention-to-treat analyses may have diluted effect estimates and reduced the sensitivity to detect moderation effects. Furthermore, the results of both intention-to-treat and complete-case analyses could be influenced by attrition-related biases. Specifically, although the MY-CATS study had a relatively low attrition rate, attrition analyses indicated that the missing data were not completely random. Significant associations were observed between attritions and several potential moderators such as parent/carer cohabiting status, education level, and child anxiety symptom severity at screening and baseline. The unbalanced attrition between intervention and control groups were also observed in several subgroups (see details in the *Data analysis* section of this chapter). For the intention-to-treat analyses, such non-random attrition may compromise the accuracy of multiple imputation which is based on Missing at Random (MAR) assumption. For complete-case analyses, such non-random attrition can undermine the benefits of randomisation and reduce the representativeness of findings for subgroups with higher attrition. In addition, since participants with poorer outcomes are more likely to drop out, complete-case analyses may overestimate intervention effects in subgroups with high attrition, thereby reducing the validity of moderation findings. Future research could extend the focus on identifying factors that moderate intervention effectiveness to investigating factors associated with participant attrition to better understand

who is more likely to drop out of the intervention and why. Such insights can also help inform strategies to enhance participant engagement and adherence.

Moreover, to enhance the interpretability of the results, all continuous moderators in this chapter were coded as categorical variables. While most were classified using cut-off points consistent with previous research (e.g., child elevated anxiety, behavioural inhibition, parental elevated anxiety), some cut-offs were somewhat arbitrary. For instance, parental motivation for engagement was categorised based on the distribution of parent/carer scores on the relevant questionnaire at baseline, which may limit the generalisability of relevant findings. Moreover, converting continuous moderators into categorical ones may have reduced variability in the data, thereby decreasing statistical power and the ability to detect subtle moderation effects. For example, when individuals are grouped into broad categories, meaningful differences between those within the same group may be obscured.

In addition, this chapter did not examine potential interactions between moderators. However, it is possible that certain factors influence the intervention outcomes only within specific subgroups. For example, a meta-analytic review on parent training programmes for child behavioural problems suggests that socioeconomic background may interact with initial problem severity: disadvantaged families perform worse than advantaged families only when initial problem behaviours are mild (Leijten, et al., 2013). Considering this, future research could further explore how individual moderators may interact with one another to jointly influence the effectiveness of GPD-CBT for child anxiety. This would provide a more nuanced understanding of when, for whom, and under what conditions this approach is most effective.

Finally, although the quantitative design of this chapter allows for the examination of a broad range of potential moderators within a large sample, it does not provide an in-depth understanding of why certain factors do or do not influence intervention outcomes, nor how to maximise their potential positive effects or minimise their negative effects. Qualitative research involving families who participated in the intervention could help address these limitations, offering valuable insights to support the optimisation of similar programmes for children and families with diverse needs.

Conclusion

Despite the limitations noted above, this chapter examined moderating effects of a broad range of child and parent characteristics on the child anxiety outcomes of an online parent-delivered CBT with remote therapist support targeting young children (4-7 years) identified at risk of anxiety disorders on the basis of one or more risk factors of child elevated anxiety symptoms, behavioural inhibition, parental elevated anxiety. Findings of this chapter expanded our understanding of factors that may influence the effectiveness of GPD-CBT for child anxiety, especially those delivered online, remotely, and/or targeting "at-risk" young children.

Specifically, results indicated that the intervention showed greater effect in reducing anxiety symptoms at 12 weeks post-randomisation among children with elevated anxiety before the intervention compared to those without. Greater intervention effects in reducing child anxiety symptoms were also observed among Year 2 children (6–7 years) compared to Reception children (4–5 years) at both 12 weeks and 12 months post-randomisation, while greater intervention effects in preventing anxiety disorders were observed in Reception children (4–5 years) compared to Year 2 children (6–7 years) at 12 months post-randomisation. Evidence also suggests a moderating effect that approached significance of parental motivation for engagement on the child anxiety symptom outcomes of the intervention at 12 weeks, with higher parental motivation associated with greater reductions in child anxiety symptoms. However, the moderating role of child age and parental motivation for engagement should be interpreted cautiously given the potential confounding effect of child baseline anxiety levels.

No evidence was found for the moderating role of other demographic factors (child gender, child and parent/carer ethnicity, parent/carer relationship to the child, cohabitation status, education level, employment status, family socioeconomic status), child baseline behavioural inhibition or parent baseline anxiety on intervention effects, with the intervention showing generally positive effects in most subgroups. These promising results suggest that, at least in young children (4-7 years) identified at risk of anxiety disorders based on one or more risk factors (child elevated anxiety symptoms, behavioural inhibition, parental elevated anxiety), the intervention may be broadly applicable to children and families with diverse characteristics. However, these findings should be interpreted with caution considering the small sample sizes in certain subgroups (e.g., families with father as primary participating carer, non-White British children, children at risk due to behavioural inhibition alone or all

three risk factors) and the confounding effects arising from the interrelations among child baseline anxiety symptoms, child baseline behavioural inhibition, parental baseline anxiety.

Table 3.1. Number of children identified at risk of anxiety disorders for different risk factors

Number of risks	Type/combination of risks	Number of children
One risk	Child elevated anxiety	238
	Child behavioural inhibition	39
	Parent elevated anxiety	179
Two risks	Child elevated anxiety & Child behavioural inhibition	111
	Child elevated anxiety & Parent elevated anxiety	190
	Child behavioural inhibition & Parent elevated anxiety	13
Three risks	Child elevated anxiety & Child behavioural inhibition & Parental elevated anxiety	95

Table 3.2. A summary of the content of Online Support and Intervention (OSI)

Module	**Topics covered**
Module 0: Welcome	Overview of OSI and how to use it
Module 1: Get Ready	*Psychoeducation and goal setting:* Parents learn about what anxiety is, how it can develop and what keeps anxiety going. Parents also set some goals for the intervention following the *smart* principle (specific, measurable, achievable, realistic, time-specific).
Module 2: Have-A-Go Thinking	*Conversations to explore thoughts, identify what the child needs to learn, and to validate emotions:* Parents learn about how to talk to their child about fears and worries to (1) find out what situations their child feels anxious in and what their child is thinking when feeling anxious, (2) help their child feel understood, (3) open up the possibility that there may be alternative outcomes and encourage curiosity to test out whether their fears will happen (next module).
Module 3: Testing Fears	*Testing fears:* Parents learn about how to help their child test fears taking a gradual/manageable approach using a step plan and rewards. Parents are also encouraged to set a positive example for their child through modelling.
Module 4: Becoming Independent & Controlling Worries	*Excessive worry management and increasing independence:* Parents learn about strategies that can help their child feel in control of worries, as well as promoting independence in day-to-day life.
Module 5: Problem Solving	*Problem solving:* Parents learn how to help their child to systematically solve problems that they might come across throughout this intervention and beyond.
Module 6: Keep it Going	*Relapse prevention:* In this module parents develop plans to keep working on helping their child overcome their fears and worries after the support sessions have finished.

Table 3.3. Moderators of child anxiety outcomes at 12 weeks and 12 months post-randomisation (intention-to-treat analysis)

Candidate moderator	Dummy variable(s) for the moderator	p-value for group by moderator interaction		
		Anxiety symptom outcomes at 12 weeks	Anxiety symptom outcomes at 12 months	Anxiety diagnosis outcomes at 12 months
Child year group	Dummy 1 (Reception vs. Year 1): Reception = 0, Year 1 = 1, Year 2 = 0 **Dummy 2 (Reception vs. Year 2): Reception = 0, Year 1 = 0, Year 2 = 1**	0.48 **0.04**	0.22 **0.02**	0.53 0.31
Child gender	Female=0 vs. Male=1	0.20	0.52	0.29
Child ethnicity	White British=0 vs. Others=1	0.27	0.30	0.24
Parent/carer ethnicity	White British=0 vs. Others=1	0.10	0.25	0.59
Parent/carer relationship with child[1]	Mother=0 vs. Father=1	0.22	0.16	0.54
Parent/carer partner cohabiting status	Cohabiting with a partner=0 vs. Not cohabiting with a partner=1	0.38	0.28	0.95
Parent/carer education level	No undergraduate degree=0 vs. Having an undergraduate degree or above=1	0.76	0.88	0.96
Parent/career employment status	Not full-time employed=0 vs. Full-time employed=1	0.46	0.30	0.90
Family IMD[2]	More deprived=0 vs. Less deprived=1	0.42	0.35	0.44
Parent/carer motivation for engagement	Not highly motivated=0 vs. Highly motivated =1	0.09	0.65	0.65
Child elevated anxiety symptoms at baseline[3]	Negative=0 vs. Positive=1	0.09	0.86	0.81
Child behavioural inhibition at baseline[3]	Negative=0 vs. Positive=1	0.49	0.50	0.29
Parent/carer elevated anxiety at baseline[3]	Negative=0 vs. Positive=1	0.23	0.73	0.48
Child elevated anxiety symptoms at screening stage[3]	Negative=0 vs. Positive=1	0.42	0.54	0.97
Child behavioural inhibition at screening stage[3]	Negative=0 vs. Positive=1	0.98	0.37	0.49
Parent/carer elevated anxiety at screening stage[3]	Negative=0 vs. Positive=1	0.40	0.73	0.59
Children identified at risk of anxiety disorders on a single risk	Dummy 1 (child elevated anxiety only vs. behavioural inhibition only): child elevated anxiety only= 0, behavioural inhibition only= 1, parent elevated anxiety only= 0 Dummy 2 **(**child elevated anxiety only vs. parent elevated anxiety only**):** child elevated anxiety only= 0, behavioural inhibition only= 0, parent elevated anxiety only= 1	0.41 0.08	0.30 0.28	0.58 0.96
Children identified at risk of anxiety disorders on a single risk vs. two risks[4]	Child elevated anxiety only=0 vs. Child elevated anxiety & child behavioural inhibition=1	0.44	0.87	0.40
	Child elevated anxiety only=0 vs. Child elevated anxiety & parent elevated anxiety=1	0.29	0.55	0.63
	Child behavioural inhibition only=0 vs. child elevated anxiety & child behavioural inhibition=1	0.77	0.35	0.81
	Parent elevated anxiety only=0 vs. child elevated anxiety & parent elevated anxiety=1	0.82	0.74	0.62
Children identified at risk of anxiety disorders on two risks[4] vs. three risks	Child elevated anxiety & child behavioural inhibition=0 vs. all three risks=1	0.69	0.55	0.57
	Child elevated anxiety & parent elevated anxiety=0 vs. all three risks=1	0.72	0.98	0.81

**Note:* 1. Children who participated in the programme with other caregivers rather than their parents were not included in the analysis as the sample size was below 30 (n=8).

2. More deprived: the bottom 20% of the most deprived areas in UK (IMD≤ 20%), less deprived: the remaining 80%.
3. a PAS sum score ≥34 indicates elevated child anxiety symptoms, a STSC-A sum score ≥ 30 indicates elevated child behavioural inhibition, a GAD-7 sum score ≥ 8 indicates elevated parental anxiety.
4. Children who were identified at risk of anxiety disorders for based on two risks of behavioural inhibition and parental elevated anxiety were not included in the analysis as the sample size was below 30 (n=13).

Table 3.4. Adjusted between-group mean difference of child anxiety symptoms at 12 weeks and 12 months post-randomisation in subgroups categorised by candidate moderators (intention-to-treat analysis)

Candidate moderator	Subgroup	Intervention (N=434)				Usual school practice (N=431)				Adjusted between-group mean difference[2] at 12 weeks		Adjusted between-group mean difference[2] at 12 months	
		n[1]	Mean (SD) at baseline	Mean (SD) at 12 weeks	Mean (SD) at 12 months	n[1]	Mean (SD) at baseline	Mean (SD) at 12 weeks	Mean (SD) at 12 months	Mean difference (95% CI)	p-value	Mean difference (95% CI)	p-value
Child year group	Reception	**124**	**35.28 (16.73)**	**26.35 (17.47)**	**26.03 (17.55)**	**130**	**40.25 (17.00)**	**36.03 (16.90)**	**32.24 (16.37)**	**-5.97 (-9.00 to -2.94)**	**0.000**	**-3.11 (-6.65 to 0.44)**	**0.086**
	Year 1	152	41.40 (17.11)	28.61 (17.15)	27.04 (17.58)	145	40.37 (16.42)	35.21 (16.08)	32.12 (16.54)	-7.40 (-10.18 to -4.61)	0.000	-5.95 (-9.44 to -2.46)	0.001
	Year 2	**158**	**43.66 (16.75)**	**31.40 (17.89)**	**27.78 (16.80)**	**156**	**46.56 (15.15)**	**43.85 (17.17)**	**38.37 (17.98)**	**-10.19 (-13.18 to -7.21)**	**0.000**	**-8.77 (-12.28 to -5.25)**	**0.000**
Child gender	Female	219	41.93 (17.39)	29.30 (17.18)	27.62 (17.49)	213	41.83 (15.94)	38.31 (16.74)	34.34 (16.63)	-9.10 (-11.45 to -6.73)	0.000	-6.80 (-9.52 to -4.08)	0.000
	Male	215	38.99 (16.87)	28.66 (18.04)	26.41 (17.06)	218	43.31 (16.84)	38.86 (17.61)	34.50 (17.87)	-6.85 (-9.25 to -4.44)	0.000	-5.79 (-8.84 to -2.73)	0.000
Child ethnicity	White British	353	40.99 (17.18)	28.83 (17.55)	27.61 (17.36)	354	41.98 (16.22)	38.03 (16.50)	34.71 (17.13)	-8.49 (-10.34 to -6.64)	0.000	-6.65 (-8.98 to -4.33)	0.000
	Others	80	38.23 (17.08)	29.64 (17.90)	24.44 (16.72)	74	45.42 (17.00)	41.24 (19.93)	33.00 (17.85)	-5.42 (-9.76 to -1.08)	0.014	-4.00 (-8.70 to 0.72)	0.096
Parent/carer ethnicity	White British	347	41.23 (17.28)	29.20 (17.61)	28.05 (17.58)	353	41.79 (16.25)	38.24 (17.04)	34.86 (17.20)	-8.67 (-10.54 to -6.80)	0.000	-6.64 (-8.92 to -4.37)	0.000
	Others	81	37.25 (16.47)	28.05 (17.63)	22.64 (15.18)	73	46.37 (16.65)	40.26 (17.77)	32.30 (17.41)	-4.61 (-8.74 to -0.48)	0.029	-3.86 (-8.53 to 0.82)	0.106
Parent/carer relationship with child[3]	Mother	407	40.77 (17.24)	29.19 (17.73)	27.36 (17.35)	396	42.73 (16.45)	38.87 (17.16)	35.01 (17.18)	-8.22 (-9.97 to -6.46)	0.000	-6.51 (-8.61 to -4.41)	0.000
	Father	25	35.68 (16.34)	25.65 (15.74)	21.54 (15.74)	29	38.48 (14.53)	31.50 (14.62)	23.47 (13.37)	-3.43 (-9.56 to 2.70)	0.273	0.89 (-6.31 to 8.08)	0.809
	Cohabiting with a partner	367	39.97 (16.53)	28.49 (17.23)	26.50 (16.74)	359	42.21 (16.20)	37.85 (16.88)	33.50 (16.95)	-7.69 (-9.46 to -5.92)	0.000	-5.67 (-7.84 to -3.50)	0.000

Parent/carer partner cohabiting status	Not cohabiting with a partner	63	43.39 (20.46)	31.86 (19.47)	30.04 (19.93)	66	44.57 (17.36)	42.53 (18.26)	39.37 (18.06)	-9.81 (-14.60 to -5.03)	0.000	-8.82 (-14.82 to -2.83)	0.004
Parent/carer education level	No undergraduate degree	170	41.64 (18.72)	31.12 (18.81)	29.64 (18.71)	175	45.43 (15.99)	42.27 (17.40)	38.11 (17.75)	-8.41 (-11.38 to -5.33)	0.000	-6.41 (-10.00 to -2.82)	0.000
	Having an undergraduate degree or above	252	39.68 (16.03)	27.51 (16.59)	25.23 (16.00)	247	40.53 (16.40)	35.93 (16.52)	31.76 (16.40)	-7.77 (-9.82 to -5.72)	0.000	-5.84 (-8.36 to -3.32)	0.000
Parent/career employment status	Not full-time employed	273	40.45 (17.98)	28.70 (18.08)	27.04 (17.72)	257	42.19 (16.33)	38.44 (17.20)	34.92 (17.38)	-8.45 (-10.52 to -6.39)	0.000	-6.95 (-9.49 to -4.40)	0.000
	Full-time employed	138	40.53 (15.53)	29.53 (16.64)	26.99 (16.40)	143	43.27 (16.54)	38.84 (17.15)	33.50 (17.02)	-7.17 (-10.06 to -4.28)	0.000	-4.79 (-8.25 to -1.34)	0.007
Family IMD[4]	More deprived	82	41.02 (17.33)	28.38 (17.56)	28.16 (19.13)	63	47.24 (19.50)	42.68 (19.05)	40.33 (19.92)	-9.92 (-14.18 to -5.67)	0.000	-8.57 (-14.00 to -3.14)	0.002
	Less deprived	352	40.35 (17.16)	29.12 (17.63)	26.76 (16.83)	368	41.78 (15.69)	37.88 (16.75)	33.41 (16.57)	-7.71 (-9.54 to -5.88)	0.000	-5.82 (-8.06 to -3.58)	0.000
Parent/carer motivation for engagement	Not highly motivated	262	36.74 (16.29)	27.14 (16.53)	25.18 (16.47)	261	40.35 (16.11)	36.72 (16.99)	33.15 (16.80)	-6.92 (-9.07 to -4.77)	0.000	-6.02 (-8.64 to -3.39)	0.000
	Highly motivated	167	46.37 (16.93)	31.90 (18.84)	29.93 (18.13)	163	46.13 (16.27)	41.55 (17.08)	36.44 (17.80)	-9.58 (-12.70 to -6.45)	0.000	-6.69 (-9.90 to -3.49)	0.000
Child elevated anxiety symptoms at baseline[5]	Negative	160	23.47 (6.82)	17.94 (10.77)	16.61 (10.70)	128	24.08 (7.42)	23.40 (10.88)	22.28 (12.31)	-5.14 (-7.73 to -2.56)	0.000	-5.67 (-8.57 to -2.78)	0.000
	Positive	274	50.41 (13.13)	35.43 (17.61)	33.10 (17.49)	303	50.40 (12.38)	45.00 (15.19)	39.55 (16.46)	-9.60 (-11.74 to -7.45)	0.000	-6.50 (-9.21 to -3.80)	0.000
Child behavioural inhibition at basline[5]	Negative	332	37.59 (15.22)	26.51 (15.05)	25.09 (15.24)	305	37.96 (14.49)	34.33 (15.27)	30.89 (15.22)	-7.61 (-9.48 to -5.73)	0.000	-5.70 (-7.98 to -3.42)	0.000
	Positive	102	49.85 (19.73)	37.04 (22.34)	33.32 (21.57)	126	53.77 (15.34)	48.89 (17.18)	42.97 (18.91)	-8.56 (-12.21 to -4.91)	0.000	-7.14 (-11.67 to -2.60)	0.002
Parent/carer elevated anxiety at baseline[5]	Negative	264	38.84 (16.12)	27.12 (16.47)	24.91 (16.42)	257	39.51 (15.19)	34.77 (15.18)	31.11 (15.63)	-7.20 (-9.23 to -5.18)	0.000	-5.90 (-8.41 to -3.40)	0.000
	Positive	170	43.01 (18.46)	31.87 (18.90)	30.29 (17.98)	174	47.11 (17.09)	44.23 (18.37)	39.30 (18.38)	-9.16 (-12.08 to -6.24)	0.000	-6.41 (-9.74 to -3.08)	0.000
Child elevated anxiety at screening stage[5]	Negative	137	26.85 (11.92)	18.77 (12.14)	17.84 (13.37)	94	25.53 (11.19)	24.80 (13.77)	22.12 (12.99)	-6.67 (-9.83 to -3.51)	0.000	-5.04 (-8.58 to -1.50)	0.005
	Positive	297	46.76 (15.52)	33.69 (17.74)	31.26 (17.24)	337	47.34 (14.33)	42.43 (16.02)	37.85 (16.73)	-8.32 (-10.33 to -6.30)	0.000	-6.29 (-8.82 to -3.77)	0.000
	Negative	308	37.90 (15.61)	26.80 (15.65)	25.44 (15.39)	299	38.39 (14.45)	35.16 (15.56)	31.16 (15.10)	-8.08 (-10.03 to -6.13)	0.000	-5.55 (-7.87 to -3.22)	0.000

Child behavioural inhibition at screening stage[5]	Positive	126	46.76 (19.17)	34.32 (20.75)	30.88 (20.74)	132	52.07 (16.62)	46.34 (18.14)	41.79 (19.47)	-7.68 (-11.03 to -4.33)	0.000	-7.31 (-11.52 to -3.10)	0.001
Parent/carer elevated anxiety at screening stage[5]	Negative	198	41.30 (14.73)	28.22 (15.75)	25.55 (14.86)	190	43.59 (13.58)	38.76 (14.22)	33.44 (15.64)	-8.97 (-11.33 to -6.46)	0.000	-6.64 (-9.52 to -3.77)	0.000
	Positive	236	39.78 (18.99)	29.63 (19.02)	28.25 (19.00)	241	41.78 (18.30)	38.45 (19.20)	35.19 (18.41)	-7.37 (-9.71 to -5.02)	0.000	-5.81 (-8.75 to -2.87)	0.000
Children identified at risk of anxiety disorders on a single risk	Child elevated anxiety only	117	40.32 (12.07)	27.27 (13.24)	24.92 (12.61)	121	41.40 (10.92)	37.86 (12.60)	32.01 (13.88)	-9.90 (-12.75 to -7.04)	0.000	-6.83 (-10.28 to -3.38)	0.000
	Child behavioural inhibition only	28	27.75 (11.59)	18.79 (11.19)	15.52 (12.14)	11	33.09 (8.72)	28.39 (9.53)	19.68 (11.79)	-8.17 (-16.91 to 0.57)	0.067	-3.20 (-13.69 to 7.28)	0.549
	Parent elevated anxiety only	102	26.25 (12.00)	18.66 (12.61)	18.80 (13.76)	77	24.13 (11.07)	23.41 (13.24)	21.51 (12.66)	-6.20 (-9.68 to -2.72)	0.000	-4.15 (-8.16 to -0.14)	0.043
Children identified at risk of anxiety disorders on two risks[6]	Child elevated anxiety & behavioural inhibition	53	50.62 (15.42)	35.29 (19.54)	32.25 (17.35)	58	50.16 (16.48)	42.60 (17.67)	39.02 (17.49)	-7.61 (-12.73 to -2.48)	0.004	-7.45 (-13.45 to -1.45)	0.015
	Child elevated anxiety & parent elevated anxiety	89	48.08 (14.93)	35.52 (16.91)	33.74 (16.63)	101	45.65 (12.87)	40.89 (15.76)	37.50 (14.54)	-7.38 (-11.37 to -3.38)	0.000	-4.87 (-9.75 to 0.00)	0.050
Children identified at risk of anxiety disorders on three risks	All three risks	38	58.13 (17.77)	46.96 (20.63)	43.57 (22.20)	57	60.03 (12.27)	54.59 (16.28)	49.65 (18.87)	-6.16 (-11.80 to -0.53)	0.032	-4.81 (-12.05 to 2.42)	0.192

**Note:* 1. n is the sample size of each subgroup before the moderator was imputed, while the mean (SD) of each subgroup and mean difference between subgroups were calculated based on imputed data.

2. The mean difference presented in the table was calculated based on adjusted model (controlling child baseline anxiety symptom levels, school-level free school meal status and cluster size).

3. Children who participated in the programme with other caregivers rather than their parents were not included in the analysis as the sample size was below 30 (n=8).

4. More deprived: the bottom 20% of the most deprived areas in UK (IMD≤ 20%), less deprived: the remaining 80%.

5. a PAS sum score ≥34 indicates elevated child anxiety symptoms, a STSC-A sum score ≥ 30 indicates elevated child behavioural inhibition, a GAD-7 sum score ≥ 8 indicates elevated parental anxiety.

6. Children who were screened positive on a combination of behavioural inhibition and parental elevated anxiety were not included in the analysis as the sample size was below 30 (n=13).

Table 3.5. Adjusted odd ratios of child anxiety diagnosis at 12 months post randomisation in subgroups categorised by candidate moderators (intention-to-treat analysis)

Candidate moderator	Subgroup	Intervention (N=434)		Usual school practice (N=431)		Adjusted odd ratio[2] (95% CI)	p-value
		n[1]	Diagnosis rate	n[1]	Diagnosis rate		
Child year group	Reception	124	4.02%	130	11.89%	0.33 (0.07 to 1.42)	0.135
	Year 1	152	5.89%	145	8.37%	0.63 (0.20 to 1.96)	0.424
	Year 2	158	13.38%	156	19.06%	0.77 (0.37 to 1.62)	0.498
Child gender	Female	219	8.13%	213	16.16%	0.47 (0.22 to 1.01)	0.054
	Male	215	8.04%	218	10.51%	0.89 (0.39 to 2.05)	0.790
Child ethnicity	White British	353	7.15%	354	13.35%	0.54 (0.29 to 1.00)	0.049
	Others[7]	80	12.18%	74	13.07%	1.06 (0.34 to 3.27)	0.917
Parent/carer ethnicity	White British	347	8.05%	353	13.46%	0.59 (0.32 to 1.08)	0.086
	Others[7]	81	8.22%	73	12.54%	0.63 (0.18 to 2.18)	0.462
Parent/carer relationship with child[3]	Mother	407	8.61%	396	14.04%	0.65 (0.37 to 1.34)	0.130
	Father[8]	25	——	29	1.45%	Model is not identified.	
Parent/carer partner cohabiting status	Cohabiting with a partner	367	6.94%	359	11.80%	0.59 (0.32 to 1.11)	0.101
	Not cohabiting with a partner[7]	63	14.67%	66	22.34%	0.72 (0.23 to 2.28)	0.572
Parent/carer education level	Not have a undergraduate degree	170	9.62%	175	15.32%	0.62 (0.27 to 1.44)	0.264
	Having an undergraduate degree or above	252	7.03%	247	11.85%	0.61 (0.30 to 1.25)	0.179
Parent/career employment status	Not full-time employed	273	9.36%	257	15.56%	0.65 (0.34 to 1.20)	0.161
	Full-time employed	138	5.57%	143	9.26%	0.68 (0.21 to 2.24)	0.524
Family IMD[4]	More deprived	82	15.39%	63	21.21%	0.91 (0.29 to 2.87)	0.874
	Less deprived	352	6.38%	368	11.95%	0.56 (0.29 to 1.07)	0.080
Parent/carer motivation for engagement	Not highly motivated	262	7.37%	261	11.79%	0.66 (0.31 to 1.39)	0.273
	Highly motivated	167	9.20%	163	15.72%	0.53 (0.24 to 1.78)	0.120
Child elevated anxiety symptoms at baseline[5]	Negative	160	4.04%	128	5.48%	0.71 (0.19to 2.66)	0.612
	Positive	274	10.45%	303	16.61%	0.62 (0.34 to 1.12)	0.111
Child behavioural inhibition at baseline[5]	Negative	332	5.61%	305	10.68%	0.51 (0.24 to 1.07)	0.075
	Positive	102	16.14%	126	19.67%	0.86 (0.38 to 1.96)	0.725
Parent/carer elevated anxiety at baseline[5]	Negative	264	7.77%	257	10.61%	0.77 (0.38 to 1.59)	0.479
	Positive[7]	170	8.58%	174	17.28%	0.46 (0.20 to 1.06)	0.069
Child elevated anxiety at screening stage[5]	Negative	137	5.75%	94	8.17%	0.62 (0.18 to 2.20)	0.460
	Positive	297	9.16%	337	14.74%	0.62 (0.34 to 1.15)	0.132
Child behavioural inhibition at screening stage[5]	Negative	308	5.13%	299	9.47%	0.56 (0.25 to 1.24)	0.155
	Positive	126	15.30%	132	21.98%	0.81 (0.37 to 1.75)	0.585

Parent/carer elevated anxiety at screening stage[5]	Negative	198	8.62%	109	12.69%	0.70 (0.32 to 1.54)	0.372
	Positive	236	7.63%	241	13.78%	0.55 (0.25 to 1.21)	0.139
Children identified at risk of anxiety disorders on a single risk	Child elevated anxiety only	117	4.32%	121	9.72%	0.46 (0.13 to 1.67)	0.238
	Child behavioural inhibition only	28	12.64%	11	13.64%	0.95 (0.08 to 11.50)	0.969
	Parent elevated anxiety only[7]	102	3.90%	77	8.01%	0.43 (0.08 to 2.24)	0.318
Children identified at risk of anxiety disorders on a single risk vs. two risks[6]	Child elevated anxiety & child behavioural inhibition	53	16.00%	58	18.72%	0.89 (0.27 to 2.86)	0.829
	Child elevated anxiety & parent elevated anxiety[7]	89	7.60%	101	10.28%	0.74 (0.21 to 2.69)	0.656
Children identified at risk of anxiety disorders on two risks[6] vs. three risks	All three risks	38	18.16%	57	29.23%	0.53 (0.16 to 1.75)	0.299

**Note:* 1. n is the sample size of each subgroup before the moderator was imputed, while the diagnosis rate (number of children with anxiety diagnosis/total sample size) of each subgroup and odd ratios between subgroups were calculated based on imputed data.
2. Adjusted odd ratio (95%CI) was calculated based on adjusted model (controlling child baseline anxiety symptom levels, school-level free school meal status and cluster size).
3. Children who participated in the programme with other caregivers rather than their parents were not included in the analysis as the sample size was below 30 (n=8).
4. More deprived: the bottom 20% of the most deprived areas in UK (IMD≤ 20%), less deprived: the remaining 80%.
5. A PAS sum score ≥34 indicates elevated child anxiety symptoms, a STSC-A sum score ≥ 30 indicates elevated child behavioural inhibition, a GAD-7 sum score ≥ 8 indicates elevated parental anxiety.
6. Children who were screened positive on a combination of behavioural inhibition and parental elevated anxiety were not included in the analysis as the sample size was below 30 (n=13).
7. The model adjusted for child baseline anxiety symptom levels, school-level free school meal status and cluster size cannot be identified given the small sample size of the subgroup. The odd ratio of this subgroup was calculated based on the unadjusted model (without controlling child baseline anxiety symptom levels, school-level free school meal status and cluster size). For comparison, for other subgroup(s) of the candidate moderator, we also presented the odd ratios calculated based on the unadjusted model. But the diagnosis rate of each subgroup was calculated based on imputed data.
8. The model adjusted for child baseline anxiety symptom levels, school-level free school meal status and cluster size cannot be identified given the small sample size of the subgroup. We also run unadjusted model which cannot be identified either. The diagnosis rate within intervention group of this subgroup cannot be calculated because in the complete case dataset and some of the imputed datasets, none of children in this subgroup was diagnosed with an anxiety disorder.

Chapter 4: What Factors Influence Reductions in Young Children's Anxiety from an Online Parent-Delivered CBT with Remote Therapist Support? A Qualitative Study of Parents' Perspectives

Introduction

Although the quantitative study presented in Chapter 3 examined a broad range of potential moderators that may influence the effectiveness of the GPD-CBT programme evaluated in the MY-CATS study, its quantitative design was limited to examining pre-hypothesised moderators and may have missed novel or unexpected factors that we may become aware of from listening to participants' experiences. A qualitative study can not only address this gap by uncovering those factors but also provide insights into how each factor exerts its influence and how to maximise positive influence or minimise negative influence. Such insights are important for optimising the design and delivery of future similar interventions.

As introduced in Chapter one (see the *Moderators of GPD-CBT* section), Allard et al. (2022) is the only published study to date that has qualitatively explored factors that may influence the effectiveness of GPD-CBT for treatment of child anxiety disorders. However, as noted in Chapter one, focusing a GPD-CBT programme for children aged 7-12 years with anxiety disorders delivered through a self-help book with therapist support through a combination of face-to-face and telephone section, its findings may not generalise to GPD-CBT programmes with different delivery formats and target populations, such as the GPD-CBT programme evaluated in the MY-CATS study which was delivered online, entirely remotely, targeting younger children (4-7 years) identified at risk of anxiety disorders rather than older children (7-12 years) with a diagnosed anxiety disorder.

To address the limitations of the quantitative work in Chapter 3 and provide more qualitative evidence on factors that may influence the effectiveness of GPD-CBT for child anxiety, this chapter analysed 19 transcribed one-to-one interviews with parents who received the online GPD-CBT programme evaluated in the MY-CATS study. Using an inductive reflexive thematic analysis approach, this qualitative study aimed to develop an in-depth and comprehensive understanding of parents' perspectives on the following questions:

(1) What factors positively or negatively influence young children's anxiety outcomes following delivery of the intervention?
(2) How do these factors exert their influence?
(3) What may maximise potential positive influences or mitigate potential negative influences on child anxiety outcomes?

Method

Procedure

This chapter was a secondary analysis of the qualitative data collected in the MY-CATS study. The recruitment, screening, randomisation, and assessment procedures of the MY-CATS study have been introduced in Chapter three (see section of *Procedure*). In addition to that, the MY-CATS study also invited parents from the intervention group for one-to-one interviews to explore their experiences with the intervention and the study. Purposive sampling was used to capture variations in the following characteristics: (1) recruitment cohort, school region and school level of deprivation (percentage of students provided free school meals[6]), (2) family socio-economic conditions (family income, parental employment status and education background), (3) parent ethnicity and gender, (4) child age and gender, (5) which measure/s the family screened positive on for the trial (child elevated anxiety symptoms and/or behavioural inhibition and/or parental elevated anxiety symptoms). All interviewed parents provided informed written consent, including consent for audio recording the interview.

One-to-one semi-structured interviews were conducted via telephone by two research assistants from the MY-CATS team (NN, NP). The topic guide for the interviews, which I developed collaboratively with NN and TR, included a wide range of questions about parents' experiences of the intervention and the study. Open and follow-up questions were also asked to ensure a comprehensive and in-depth exploration of parents' perspectives. This chapter focuses on the influence of both baseline factors (i.e., factors that may differ across families at baseline) and process-related factors (i.e., factors that can only emerge after the intervention starts and may differ across families). Some questions specifically focused on

6 Free school meals (FSM) in the UK provide eligible students with a daily healthy school meal at no cost. This initiative supports children from low-income families. National average FSM in 2019 = 15.8%

parents' perspectives on factors that may influence intervention effectiveness (e.g., *"What do you think helped you/your child/your family etc. to make changes?" "Did anything make it hard for you/your child/your family to make changes?"*). I anticipated that parents' responses to these particular questions would be most likely to be relevant to the research questions of this chapter, however, full transcriptions of all interviews were analysed to avoid missing valuable information.

Interviews ranged from 45 to 95 minutes and were conducted 4 to 10 months after parents were randomised to the intervention arm. By the time of the interviews, all parents had finished all seven online modules and telephone/video calls sessions with their therapists. All interviews were audio-recorded, and the audio-recordings of the interviews were transcribed verbatim and anonymised by members of the research team, with identifiable information removed or replaced in transcriptions. Parents were offered a £10 gift voucher for completing the interview.

Participants

A total of 19 parents recruited from the intervention group in the MY-CATS study were interviewed (17 mothers and 2 fathers). Children of these parents (7 girls and 12 boys) were aged 4-7 years, with a median age of 6.5 years. Ten children had been identified as at risk of anxiety disorders due to elevated child anxiety symptoms or/and behavioural inhibition, two due to parental elevated anxiety symptoms, and seven due to both child and parental elevated anxiety symptoms. All participating parents were the primary implementer of the intervention. Parent ages ranged from 30 to 47 (median age 38.4). Most parents had an undergraduate degree or above (15 out of 19). Employment status varied: seven were employed full-time, four were employed part-time, one was a student, three were unemployed, and three were otherwise employed. Eleven parents were White British, two were from other White backgrounds, three were Asian or Asian British, one was Black or Black British, one was Mixed White and Black African. Most parents had more than one child in the household (n=14). Most parents cohabited with their partner during the intervention (17 out of 19). Household incomes ranged from below £16,000 to over £120,000 per year. More details of participant characteristics are provided in the Appendix 4.

Intervention

The details of the online GPD-CBT intervention delivered in the MY-CATS study: Online Support and Intervention (OSI) with remote therapist support, have been presented in Chapter three (see the section of *Intervention*).

Data analysis

The analysis was inductive. Each transcribed interview was first coded line-by-line using NVivo 20 software. The coding process was iterative; as each new transcript was coded earlier transcripts were revisited and codes were constantly reviewed and refined. Codes were then gradually organised into groups. Each group represented a factor that may influence the effectiveness of the intervention in reducing children's anxiety, including how this factor may exert its influence and what may maximise its positive influence or minimise its negative influence, evidenced by direct quotes from the transcripts. All identified factors were then organised into four categories. This was also an iterative process involving multiple reviews of the data, paying particular attention to the associations and distinctions between all factors and categories, as well as the validity of each factor and category to ensure that they were relevant to the research questions and reflected the interviews accurately (Braun & Clark, 2021).

I led the analysis and had regular discussions with other research team members (CC, TR) to ensure the interpretation was not biased by a single perspective. An extended team meeting, including two external experts (GH, HM), was convened to broaden perspectives. To ensure reflexivity, researchers reflected their biases throughout the analysis. Specifically, as a doctoral student focusing on family and young children's mental health, I believe that parents play a critical role in children's psychological development, which may shape my expectations about parent-related factors that may influence intervention outcomes. Additionally, although I was involved in designing the interview topic guide and transcribing the recordings, I did not conduct the interviews myself and the interviews were all complete before analysis began. This could have influenced the data analysis by for example, a lack of opportunity to iteratively adjust the interviews to explore emerging themes. CC and TR were the principal investigator and lead researcher of the MY-CATS study and had extensive qualitative research experience in child mental health and a deep understanding of the theoretical foundations, design, and delivery of the intervention, with a keen interest in parents' feedback. GH is a clinical psychologist and provided supervision to the CWPs who

interacted with parents via telephone/video calls during the intervention. Her clinical background and hands-on experience meant she had a deep understanding of parents' actual experiences expressed in the interviews. However, it is important to note that CC, TR, and GH's involvement in the design, delivery, and evaluation of the intervention may introduce biases due to their belief in the value of the approach and the pre-assumptions about factors that could influence it outcomes. HM is a doctoral student with extensive experience of qualitative research with parents of children with anxiety difficulties within UK primary school settings; she helped extract key insights from parents' expressions. HM was not directly involved in the initial intervention design, delivery, and evaluation. Although this distance allowed her to critically assess and challenge potential biases that may arise from the other researchers/involvement, it came with drawbacks such as relative lack of familiarity with the data (Bryman, 2012).

Results

Eleven factors were identified that reflect parents' perceptions of what might influence the child anxiety outcomes of the online GPD-CBT intervention delivered in the MY-CATS study (e.g., OSI with remote therapist support). These factors were organised into four categories: (1) child characteristics including child baseline anxiety, child ability and willingness to talk about feelings and thoughts, child motivation for intervention activities; (2) parent characteristics including parental baseline anxiety, parent familiarity with digital technology, parental time and capacity; (3) parent intervention delivery including having clear goals, being persistent, implementing the intervention with child awareness; (4) other available support including involvement of other parents/caregivers and involvement of the child's school. The following sections present parents' insights on how these factors exerted their influence, and what may maximise potential positive influences or mitigate potential negative influences, illustrated by exemplary quotes.

Child characteristics

Child baseline anxiety. A key aspect of the intervention approach involves helping parents to help their children to try out intervention strategies in situations that their child finds anxiety-provoking. Some parents of children with elevated anxiety symptoms and/or behavioural inhibition at baseline reported that because their child *"had so many different worries", "there was always an opportunity just naturally to practise the things that were in the modules." (P1).* However, some children were included in the MY-CATS study due to their

parents' elevated anxiety rather than their own elevated anxiety/behavioral inhibition. An anxious mother of a less anxious child felt that it was difficult to find opportunities to practise intervention strategies with her child because there was little *"room for improvement"* because the child *"just didn't have many worries." (P5).*

Child ability and willingness to talk about feelings and thoughts. The intervention teaches parents how to ask curious questions to explore children's fears and worries to help identify what the child needs to learn to overcome any problems with anxiety. One father believed that these techniques worked well for his child because the child was "*super open, super communicative"* and "*didn't have a problem talking about things that make him feel worried or scared.*" (P3). However, some parents found it difficult to practise these techniques because their children "*didn't necessarily have the words to express herself properly yet*" *(P2).*

Despite that, parents identified two ways to help mitigate the potential negative influence of their child's limited ability or willingness to talk about feelings and thoughts. One was making use of other intervention components, such as graded exposure. For example, a girl who struggled with talking about her fears and worries *"responded so well to being brave and setting little tasks and challenges for her to do and having the reward at the end." (P2).* The other way was developing children's ability and willingness to talk about feelings and thoughts during the intervention. For example, one mother noted that having more conversations about fears and worries helped her son develop his ability to express himself: *"When we started first talking about worries, he was like 'what do you mean a worry? What's a worry?' But then once I explained it to him, he quite got it and was like 'oh, actually I have quite a few of them'.... He didn't really have the language obviously to maybe speak about worries, which is so normal at that young age, but it can be helpful to provide that language." (P6).* Another mother highlighted that asking curious questions helped her daughter open up: *"...that was the frustrating thing because I was being quite open and trying to get [child] to meet me halfway.... But it's not that she didn't want to she just didn't know how to. So, it was only when I had those probing questions and knowing how to ask... once I had those tools to how to dig a little bit deeper..." (P9).* A few parents reported that encouraging and validating their child's expression, as taught by the intervention, helped the child become *"more willing to talk to me about things that make her anxious." (P11).* As a mother said: *"we praised him a lot by saying 'if you told us, that's why we could go and deal*

with it.' .... Now he was quite comfortable and confident in telling us what was bothering him…And we took action and it got resolved." (P16).

Child motivation for intervention activities. A father reported that the intervention worked well for his child because the child was highly motivated to participate: *"I feel like a lot of that was down to me not having to browbeat [child] into doing it. And I don't know how much more difficult it would have been if he wasn't into it."* (P3). Several parents attributed children's motivation for engagement to children's self-awareness of their anxiety problems and a desire to be helped*:* "*he was engaged to do it…. because I think he realised he was struggling…He was getting really stressed himself and I think he knew that". (P6).* In addition, a number of parents attributed their child's motivation for engagement to some specific intervention components. Specifically, one mother noted that the intervention taught her how to reward her daughter for testing fears in an appropriate way, which motivated her daughter to be *"really determined to try her hardest too" (P2).* Another mother mentioned that the intervention encouraged her to develop plans for fear testing and problem solving together with her son, which made the child feel "*it is all about him." (P19)*, thus motivating her son's engagement. Another mother believed that her son became more motivated to engage in the intervention because she conveyed acknowledgment from the therapist (i.e., Children's Wellbeing Practitioner, CWP) to him, as "*he was really looking forward to seeing if someone else was also proud of him." (P6).* In addition, the intervention created more one to-one time between the targeted child and parent, which was also a motivation for some children to get engaged, especially those from families with multiple children in the household: *"She loved it because she got more time with me really because she's got a younger brother who takes up a lot of my time and is very clingy to me." (P5).*

Parent characteristics

Parental baseline anxiety. Some parents initially worried that their own experiences of anxiety might impede their ability to deliver the intervention but felt that certain elements of the intervention helped them implement the intervention effectively. For example, one mother reported that the goal setting strategy introduced in Module 1 (i.e., "SMART" goals), together with therapist support, helped her stop overthinking and focus on specific tasks, enabling her to deliver the intervention effectively despite her anxiety: "*In the beginning, I completely was overthinking things, which for me is quite normal. But when I spoke to [CWP] about it, she*

just simplified it for me which made it a lot more sense… I was shortening things and doing things on a day-to-day basis using the SMART goals, it was actually a lot easier to do than I realised" (P5).

Another mother who used to worry about "*how to handle a situation that [child] is anxious about that I'm also anxious about"* reported that some strategies provided in the intervention, which were originally designed for child's anxiety, also helped her manage her own anxiety and enabled her to better deal with her child's anxiety: "*It was just more myself and how I can control mine…Instead of saying 'I don't like it either', I said "I understand, but actually, so far, what has happened for you to be so scared?' He goes 'well nothing', whereas I'm sitting there thinking 'okay nothing's ever happened to me, I need to believe it myself'." (P17).*

Parent familiarity with digital technology. The intervention requires parents to complete online modules. Some parents mentioned that the intervention worked well for them because: "*we are all comfortable on the technology side of things." (P3).* A few parents expressed concerns that *"if it was someone who was not used to the internet…they might've struggled" (P6).* However, the user-friendly design of the online system of the intervention appeared to help; it was notable that all parents interviewed in this study reported that the online system was: "*very user friendly, very straightforward, which, to be fair, is for anybody to log on" (P8),* including one parent who regarded herself as a "technophobe": *"I'm a bit of a technophobe myself to be honest…But once I'd actually worked it out… it was quite easy to use."(P3).*

Parental time and capacity. Some intervention exercises needed parents to invest "*a lot of time and a lot of commitment" (P14).* Some parents indeed had concerns about whether they had enough time and capacity to fully engage with the intervention before it started as "*lots of other things were going on*" in their work and family life (P3). Despite that, all participating parents, including those with full-time jobs or/and multiple children in the household, managed to find time for implementing the intervention. Several parents attributed that to their awareness of their child's anxiety difficulties and need for help: *"the timing thing was not really a concern for me… I felt like my son was struggling, I wanted to put time in on it."* (P18). A few parents mentioned that the involvement of other parent/carers helped them with time management: *"When I spoke to other people [child's grandparents] and got their support and they were doing it with me, it made things a lot easier, so it wasn't just a 'me'*

thing…. I don't think I could have done it on my own" (P8). Many parents appreciated that the intervention provided a flexible time schedule which accommodated their busy work and life: "[*CWP] was very flexible… we moved a couple of sessions around and she was always open to the last-minute changes." (P11).* Some parents also highlighted that most intervention exercises could be "*easy to apply in everyday life, so it wasn't as time consuming as you first think it's gonna be" (P8).* As one mother said: *"I brought it into when I would generally chat at the dinner table or if I take her swimming. And I would use the tools within general conversation. So not separating it out. It wasn't really extra time. You would obviously interact with your child anyways." (P9).*

Parent intervention delivery

Having clear goals. Some parents emphasised that having clear goals was essential for the success of the intervention. A father reported that clear goals provided him with focus and direction, enabling him to personalise the intervention content for his child and implement the intervention efficiently: "*it was nice to know the expectation, so that you'd do what was working for you as opposed to just doing stuff… We put a lot more time and effort into than others that [the child] didn't seem to respond to or didn't have any interest in. That was quite helpful actually… it was more like you've got to make it work for you." (P3).* A mother noted that clear goals helped her maintain consistency in implementing the intervention, allowing time for her child to make progress: "*I feel like we've got to the final goals a lot quicker than what we would have on our own. I don't know if that's because there wasn't a main goal to focus on. it was more of a just a "let's jump the hurdle everyday" rather than 'actually let's get somewhere and do it consistently.*" *(P8)*. This mother also mentioned that seeing her child make progress toward the goals further motivated her to persist: "*kind of made it feel more rewarding when you were doing it because you had a goal early on and you could actually see progress.*" *(P8)*. Another mother noted that by presenting and communicating goals with her child, she was able to make the intervention process more tangible and manageable for her child, which promoted the child's engagement: "*So, the goal where we really spoke to him and explained why we're doing it, he really understood, and it helped him knowing the answer and seeing it like being visual and ticking off as he went along." (P17).*

As for how to establish clear goals for the intervention, some parents said that their awareness of their child's anxiety difficulties and need for help gave them clear goals for the

intervention: "*it's not that we just doing it for the sake of doing it. We're doing it to help the situation. And in that moment, we desperately needed that help. So, to know that there was an end goal with all of these activities was just brilliant.*" *(P17).* While many parents described how certain elements of the intervention helped them set specific goals, including the SMART goal setting strategies introduced in Module 1 (e.g., "*I was shortening things and doing things on a day-to-day basis…like the SMART goals", P5)* and the step plans introduced in Module 3 (e.g., "*We had those little mini goals and the little rewards and then working up to the big one", P12*).

Being persistent. Parents also highlighted the importance of being persistent for the success of the intervention: "*I think it worked really well for us because I was so invested in it. I think if the parents aren't that invested, it won't work because they'll only be half-heartedly doing it." (P6).* More specifically, some intervention exercises "*required a lot of intervention and commitment from parents". (P14).* Setbacks could occur from time to time. Parents "*had to persist in doing that for a quite a few weeks before the progress*". *(P2)* and *"it was more the perseverance that you had to have to keep revisiting things." (P8).* Furthermore, being persistent was important for maintaining intervention gains and reducing the risk of relapse: *it's not like something you're gonna do for a few weeks. You have to make it to your lifestyle. In my experience, you have to be in the same routine....it has to be consistency." (P6).*

As for what helped parents maintain persistence, one mother attributed it to her personality: "*that's the type of person that I am. When I've committed to something, I'll generally not pull out of something" (P9).* A few parents attributed their persistence to their awareness of children's anxiety difficulties and need for help: "*because I felt like my son was struggling, I wanted to put time in on it. But I can see that if you were somebody who didn't feel that way" (P18).* While many parents highlighted the crucial role of therapists in maintaining their persistence. For example, one father mentioned the monitoring role of regular contact with his therapist via telephone/video: "*I feel like having that contact meant that you're more invested in it because, if you don't do it, you're gonna look stupid... But you can talk it through if you've not done something, it actually helps you see why ... you hadn't done it." (P11)*. One mother believed that her therapist's reassurance and encouragement motivated her to persevere through a challenging time: *"[child] started to become even more hard to handle and obviously he was really struggling…then I obviously was getting a bit overwhelmed. Every time [CWP] would phone on a Friday, it was like a weight had lifted off my*

shoulders…She always like gave us a lot of reassurance and rebooted us a lot." (P6). Another mother reported that her therapist provided many suggestions, which helped her carry on despite encountering obstacles: "*I'd think she was getting better, then we'd have a setback, and it would happen again. That would kind of make me a bit discouraged to carry on. Then I'd have my weekly chat with [CWP] and she'd be like 'oh, try this' or, 'try that'…She gave lots of other suggestions of little things you could try or watch or get her to take part in". (P2)*.

Implementing the intervention with child awareness. Some parents believed that there were positive impacts of their child being aware that they were implementing the intervention. For example, a father noted that knowing more details about the intervention helped his child feel a sense of control: "*he likes to have lots of information and to be included and have control over situations." (P3).* A mother mentioned that being aware of the intervention allowed her son to establish a helpful indirect connection with the therapist (i.e., CWP), who acknowledged him and motivated his engagement: "*at first, he wouldn't participate in… But then, I'd like to explain to him what I'd been learning' with [CWP] … then he would start talking back… he was really looking forward to seeing if someone else was also proud of him." (P6).*

In contrast, some parents chose to practise intervention strategies with their child without highlighting their participation in an intervention, considering their child's tendency to be worried about change, uncertainty, or being labelled. Although these children were not fully aware of their participation in the intervention, they responded positively to intervention strategies and exercises. For example, a mother said: "*most of the time I didn't tell her what we were doing. It was more of a 'just try it and see how it went' rather than tell her why we were doing stuff. Because if we introduced something new, normally it's a 'don't wanna it'. She doesn't like change." (P8).* Despite that, the child responded positively to the conversation techniques introduced in Module 2 and the problem-solving strategies introduced in Module 5: *"she'll actually tell us about her worries rather than just waiting until it's too late……She can also use her own brain to think of different solutions to do things now rather than relying on me…*".

Other available support

Involvement of other parent/carers. For each child, the intervention required the participation of one parent/carer as the primary implementer. However, many parents reported that the involvement of other parents/carers (e.g., another parent or grandparents) was helpful. Specifically, some parents found their partner's participation offered different perspectives: "*[child's father]'s suggesting things that I hadn't thought of…so I thought it would be great to kind of bring him into the meetings." (P9).* A few parents felt that having both parents involved facilitated consistency within the family: "*That was a big thing both of us (mother and father) being on the same page…just made it more consistent…We both knew what the plan was, so even if one was away, we knew exactly what we needed to do following the plan." (P14).* Some parents involved grandparents to help with time management: "*If I was not working, it'd have been simple. But not being there a lot in the evenings, I needed the support. It's lucky that it was my parents because I don't feel like if she was in childcare that she'd have had that same support…just wouldn't have worked." (P8).*

Despite the benefits of involving other parent/carers, some parents managed to deliver the intervention effectively on their own without support from other family members. A single mother, for example, attributed her independent success to her persistence: *"I did kind of struggle a little bit. but in the end, it worked out very well for us. I'm glad that I stuck to it and carried on". (P2).* This persistence mainly stemmed from her awareness of her daughter's anxiety difficulties and urgent need for help: *"As a single parent obviously, I've got lots of other things going on… but when I balance that with the impact it might have on my daughter, it seems something worthwhile taking part in… The girl who didn't make friends easily, who wouldn't eat these things; it was really playing on my mind".* The support from the therapist, who offered insightful suggestions, understanding, and reassurance, was also helpful: *"She gave lots of other suggestions of little things that I wouldn't have necessarily thought to do myself… And there were times when I worried that it wouldn't be okay, it probably brought out some of my anxieties, So I think it's about having the person to talk to about it was really useful."*

School involvement. Some parents mentioned that involving their child's school in the intervention could be helpful for information sharing: *"it would've been nice to share the information. I think the teachers are probably the best people within that environment, because they see the kids day in day out." (P2).* Several parents appreciated teachers' involvement because they could help children deal with anxiety-provoking situations at

school: "*I remember just mentioning it to one or two of the teachers that [child] interacts with that [child] is working toward speaking to other teachers and stuff, so that one teacher made a point of chatting to [child] a bit more, finding something that's interesting to him…so that definitely helped." (P12).*

Despite the likely benefits of school involvement, many interviewed parents reported limited school involvement during the intervention: "*The school, to be honest, they sent out the email about it [the study] and then that was kind of the end of their involvement…. they didn't ask about it..." (P2).* However, a few parents mentioned that the work they were doing with the intervention encouraged them to actively reach out to school staff for support, resulting in greater school involvement in the intervention: "*... one thing that was different was I did talk to his teacher this year and I told her "Even though he's writing looks fine compared to other kids, he's quite anxious about it". So, she actually made sure she gave him quite a lot of support to make him feel like "it was okay". ... maybe I wouldn't have thought of doing that if I hadn't been through the study." (P18).*

Discussion

The qualitative study presented in this chapter identified a number of factors that parents felt had influenced the effectiveness of the online GPD-CBT programme evaluated in the MY-CATS study. It also revealed parents' perspectives on how these factors exerted their influence and what might maximise potential positive influences or mitigate potential negative influences. Although findings from this study are drawn from an online parent-delivered CBT programme with remote therapist support for reducing anxiety in "at-risk" young children, some of them may have broader implications for GPD-CBT programmes for child anxiety delivered in various formats (e.g., through online platform or self-help book, with varying amounts and forms of therapist involvement) and/or targeting different populations (e.g., different age groups, children who are at risk of or with diagnosed anxiety disorders).

Insights for future quantitative investigations

This chapter identified the potential influence of some factors that were not examined in the quantitative study presented in Chapter 3, including baseline factors related to child and parent characteristics (e.g., child ability and willingness to talk about feelings and thoughts,

child motivation for intervention activities, parental familiarity with digital technology, parental time and capacity) and process-related factors related to parental intervention delivery (e.g., having clear goals, being persistent, implementing the intervention with child awareness, and involving other parent/carers and child's school). These findings highlight the potential benefit of gathering information on these factors and examining their influence on outcomes quantitatively in future studies involving larger samples.

This chapter also highlight that although some factors may potentially create risks for poorer engagement or outcomes (e.g., a child's limited ability or willingness to talk about feelings and thoughts, limited motivation for intervention activities, parental anxiety, limited familiarity with tech, and limited parent time and capacity), they can also be successfully addressed by characteristics of the intervention (e.g., the inclusion of certain intervention content, regular therapist support, a user-friendly online system, flexible time scheduling). These findings suggest that the extent to which a factor moderates intervention outcomes may vary across studies, depending on how effectively the intervention addresses the challenges associated with that factor. This perspective may help explain the lack of evidence for some potential moderators examined in Chapter 3 (e.g., parental anxiety). Future quantitative studies examining moderators of GPD-CBT for child anxiety should also take this into account when interpreting their findings.

Implications in clinical practice

Who should the intervention target. Findings of this study suggested that children with higher initial anxiety severity appeared to benefit more from the intervention. Specifically, parents who recognised their child's anxiety difficulties and need for help appeared to have clear goals and were particularly motivated to invest time in the intervention and persist with it. Children who were aware of their own challenges and need for support were also clearly motivated to actively participate in the intervention. In contrast, parents of children without specific anxiety difficulties (e.g., anxious parents of non-anxious children in the MY-CATS study) sometimes found it hard to make use of the intervention strategies as there were no specific anxiety problems to work on. These findings were consistent with the quantitative results in Chapter 3, which indicated that the intervention showed significant greater effect in reducing child anxiety symptoms among children with higher initial anxiety severity than

among those without. Findings of this chapter provided further explanation for this pattern from parents' perspectives.

Despite that, quantitative results in Chapter 3 also showed that although the intervention appeared to show smaller effects in reducing child anxiety symptoms in subgroups of children with lower initial anxiety symptoms (e.g., children identified at risk of anxiety disorders due to parental anxiety only), the intervention still demonstrated positive effects among those subgroups, suggesting that GPD-CBT can be applicable for these populations as well. Therefore, future GPD-CBT programmes should explore ways of maximising intervention effectiveness for children who may not currently exhibit anxiety difficulties but remain at heightened risk due to other factors (e.g., parental anxiety). For example, Dunn et al (2024) recently found positive effects from an online prevention programme delivered in the context of elevated maternal anxiety which focused on promoting positive parenting, healthy lifestyles, and reducing potentially anxiogenic parental behaviours such as modelling. Future GPD-CBT programmes may consider incorporating similar strategies as an additional resource for anxious parents of non-anxious children, thereby helping to interrupt the intergenerational transmission of anxiety and prevent anxiety symptoms in children.

Overcoming challenges in implementation. A challenge some parents encountered when implementing the GPD-CBT intervention in the MY-CATS study was their children's limited ability and willingness to express their feelings and thoughts. Indeed, traditional forms of CBT are thought to rely on open communication between the client and therapist to identify thought patterns, set goals, and apply strategies (Keijsers et al., 2000; Thwaites & Bennett, 2007). Where parents are taking on these tasks with their child, it can be particularly challenging if children are unable or unwilling to express themselves, especially with younger children whose language abilities may be limited. Despite that, parents found that certain intervention strategies such as increasing parent-child communication about feelings and thoughts, providing emotion validation, and asking curious questions were effective in promoting their child's ability and willingness to share their thoughts and feelings during the intervention. This finding may be valuable to share with parents and therapists who are concerned about successfully implementing a GPD-CBT programme, especially with young children who initially struggle to express themselves.

Another challenge parents mentioned was children's limited motivation to participate in implementing intervention strategies, which has also been identified as a negative predictor of outcomes in some other therapist-led child-focused CBT programmes for child anxiety (Wergeland et al., 2016). However, parents also highlighted several strategies that motivated their child's active engagement, including integrating intervention exercises into special parent-child time, conveying positive feedback from the therapist to the child, making use of rewards for facing fears, and encouraging the child's autonomy. Future GDP-CBT programmes for children, especially those for younger children, might usefully introduce these recommendations to parents.

Some parents also reported challenges related to their own anxiety when implementing the intervention. However, certain elements of the intervention, including supporting parents to set SMART goals and to apply CBT techniques for themselves, appeared to help these parents implement the intervention effectively despite their own anxiety. This may explain why the quantitative study presented in Chapter 3 found no evidence for the moderating role of parental baseline anxiety and suggest that elevated parental anxiety may not necessarily impede the success of a GPD-CBT programme for child anxiety. Future GPD-CBT programmes may benefit from sharing these experiences with parents who are concerned that their own anxiety may impede the intervention implementation, thereby alleviating their concerns and supporting their effective engagement with the intervention.

Reducing barriers of intervention use. The GPD-CBT programme in the MY-CATS study was delivered entirely online. Parents were expected to engage with digital intervention materials and apply what they learned with their child, supported by regular therapist contact via telephone or video calls. Therefore, optimising parents' use of resources is crucial for the success of this approach (Morgan et al., 2018). One barrier to accessing and utilising these intervention resources parents mentioned was limited familiarity with digital technology, which has also been associated with poorer outcomes in some other internet-based programmes for child anxiety (Spence et al., 2020). However, parents in this study also mentioned that the user-friendly online system of the intervention helped address this barrier. Future GPD-CBT programmes delivered online should also optimise the design of the online platform to ensure the ease of use for parents.

Another barrier to accessing and utilising intervention resources parents mentioned is limited time and capacity, which has also been identified as one of key barriers to intervention success in another GPD-CBT programme for anxious children delivered through a self-help book (Allard et al., 2022). However, parents in this study also highlighted several aspects of the intervention design that helped address this barrier, including flexible time scheduling, and practical exercises that fit into daily parenting routines without necessarily requiring extra time. This may help explain why factors that could limit parental time and capacity (e.g., single-parent households or full-time employment) were not associated with poorer intervention outcomes in the quantitative study in Chapter 3. Future GPD-CBT programmes should also consider offering flexible time scheduling and exercises that can be readily integrated into daily routines to enhance parents' use of intervention resources amid busy daily work and life demands.

Supporting parents to deliver the intervention effectively. Findings of this study highlight that there is no "one-size-fits-all" solution for all families when implementing a GPD-CBT for child anxiety. Parents need to be given opportunities and support to implement the intervention with flexibility to meet the particular needs of their child. For example, some children who were unable or unwilling to talk about feelings and thoughts did not always respond to the more conversation-based techniques (e.g., curious questions) in the intervention but they did appear to benefit from other intervention strategies such as gradually testing fears. This suggests that although parents can be encouraged to try all of the strategies and exercises suggested in the intervention, they may be able to achieve good outcomes by focusing on those that bring more benefits for their child. Another example of flexibility in intervention implementation was that some parents chose to implement the intervention with their child's full awareness, to give their child a sense of control, whereas some parents chose to implement the intervention without their child's awareness, to avoid causing their child to worry about new things, changes or being labelled. Both approaches were associated with positive experiences suggesting that parents can be supported to choose how to involve their children according to their needs and preferences.

This chapter also highlights the likely benefits of parents setting clear goals at the outset of the intervention to effectively implement the intervention, including providing focus and direction to tailor intervention content for children's specific needs, helping parents maintain consistency and persistence, motivating children to engage by making the process more

tangible and manageable, helping parents implement the intervention effectively despite their own anxiety by reducing overthinking and focusing on specific goals. These findings suggest that therapists supporting a GPD-CBT programme for child anxiety, whether remotely or in person, should pay particular attention to assisting parents in establishing clear goals for the intervention and providing parents with specific tools to do so, such as the SMART goal setting and setting goals for step plans strategies provided in the intervention delivered in the MY-CATS study.

Furthermore, the findings from this study underscore the importance of parental persistence for the success of the intervention, particularly in terms of overcoming challenges and setbacks, maintaining gains, and reducing the risk of relapse. Therapist support (albeit remote and brief) was also found to be crucial in helping parents maintain persistence throughout the intervention by monitoring their progress through regular telephone/video calls, reassuring and encouraging them during challenging times, and offering personalised suggestions. Evidence from some other internet-based psychological interventions have suggested that structured professional support could help the intervention reach optimal effects (Kleiboer et al., 2015; Richards & Richardson, 2012; Spek et al., 2007). Parents from another GPD-CBT programme with structured therapist support (i.e., weekly face-to-face and telephone appointments) also highlighted the key role of therapist support in their intervention implementation (Allard et al., 2022). In contrast, relatively low retention and adherence rates have been observed in a parent-delivered CBT programme for child anxiety with minimal or no therapist support (e.g., email consultations, one-time contact, or telephone support on request) (Morgan et al., 2017). Consistent with these findings, this chapter further highlighted how structured therapist support (i.e., weekly support via telephone/videocall) contributes to better outcomes and engagement of an online GPD-CBT programme for child anxiety, providing valuable insights for the design of therapist support models in similar future programmes.

This chapter also highlights the value of other available supports (such as involvement of other parents/carers and the child's school) in helping parents effectively implement the intervention in the MY-CATS study. Future GPD-CBT programmes may benefit from helping parents consider who they might be able to draw on for support and helping them to build their networks where support is lacking (e.g., parents received intervention in the MY-CATS study were encouraged to seek support from their child's school if possible). Future

programmes should also consider how to make it easier for 'the supporters' to provide useful support. For example, the online GPD-CBT intervention delivered in the MY-CATS study includes an "observer" account that allows any other adults (e.g., second parent/carer or teacher) to see the online content. Co-design efforts to learn from the experiences and particular needs of parents who may now have ready access to support and to promote collaboration with potential supporters would also be helpful. That said, future programmes should also be aware that additional support from other family members or a child's school is not a necessary condition for the success of the intervention. Despite the likely benefits of additional support, some parents in this qualitative study successfully implemented the intervention independently- which they attributed to clear goals, being persistent, and receiving therapist support, as mentioned above. Consistent with that, the quantitative study in Chapter 3 also found no evidence for the moderating effect of parent/carer partner cohabiting status on intervention outcomes. Therefore, the absence of additional support should not be seen as a barrier for parents to engage with and succeed in a GPD-CBT programme. Therapists in future GPD-CBT programmes should be mindful of this, ensuring that parents (e.g., single parents) do not feel discouraged or doubt their ability to succeed due to the lack of support from a second parent/caregiver or their child's school.

Strengths and limitations

Using an inductive reflexive thematic analysis approach, the qualitative study presented in this chapter explored parents' experiences in depth and identified a broad range of factors that may influence the effectiveness of the online GPD-CBT programme evaluated in the MY-CATS study, some of which were not captured in the quantitative study presented in Chapter 3. Findings of this study also offered valuable insights into how a moderator might exert its influences on intervention outcomes and what may maximise potential positive influences or mitigate potential negative influences. These insights provide evidence-based interpretation for some quantitative results reported in the quantitative study presented in Chapter 3 and provide valuable insights for optimising the design and delivery of future GPD-CBT programmes for child anxiety to better support children and families with diverse need.

Despite the above strengths, this study also has a number of limitations. Firstly, all parents in this study completed all the online modules and therapist calls provided in the intervention. The lack of views from parents who dropped out early in this study limits our ability to

capture the experiences of these parents. Future research should explore the experiences of these parents to identify and address potential barriers for parents to fully engage in the intervention. Furthermore, this study exclusively focused on parents' perspectives. However, children and mental health professionals are also important participants in GPD-CBT programmes. Future investigations into their perspectives are needed to incorporate more diverse perspectives. Moreover, despite efforts to seek diversity in participant characteristics, the final participating parents still lacked demographic diversity in certain aspects, such as the fact that most parents were children's mothers, were highly educated, from White British backgrounds, and cohabited with their partners during the intervention. Therefore, the findings of this study may not fully reflect experiences of parents who were children's fathers, less educated, from ethnic minority backgrounds, or from single-parent households. Future studies should aim to explore the experiences of parents from more diverse demographic backgrounds to optimise the design and delivery of the intervention for families with diverse backgrounds. In addition, none of the interviewed parents mentioned whether their children had any form of neurodiversity. Therefore, the findings may not reflect the experiences of neurodivergent children and their parents with the intervention, nor the factors that may have influenced their engagement or outcomes. Finally, all parents in this study were interviewed within 4 to 10 months after being randomised into the intervention group. While they had all finished the intervention, the findings can only reflect factors that influence the short-term effectiveness of the intervention. Future studies on factors that may influence the long-term outcomes of the intervention would be helpful for enhancing the maintenance of intervention gains.

Conclusion

Despite these limitations, the qualitative study presented in this chapter identified factors that may influence the effectiveness of an online parent-delivered CBT programme with remote therapist support in reducing anxiety in young children identified at risk of anxiety disorders, including baseline factors related to child and family characteristics, process-related factors related to parental intervention delivery and other available support. It also reveals how these factors may exert their influences, as well as how to maximise positive and mitigate negative influences. These insights have clear implications for the design and delivery of future improved programmes, particularly in terms of who the intervention should target, overcoming challenges in intervention implementation, reducing barriers to intervention use,

and supporting parents to deliver the intervention effectively. Although these findings are directly relevant to online parent-delivered CBT programmes with remote therapist support for reducing anxiety in "at-risk" young children, some of them may have broader implications for GPD-CBT programmes for child anxiety delivered in various formats (e.g., through online platform or self-help book, with varying amounts and forms of therapist involvement) and/or targeting different populations (e.g., different age groups, children who are at risk of or with diagnosed anxiety disorders).

Chapter 5: Mediators of an Online Therapist-Guided Parent-Delivered CBT for Reducing Anxiety in Young Children Identified at Risk of Anxiety Disorders

Introduction

As introduced in Chapter 1 (see section of *Mediators of GPD-CBT*), understanding the underlying mechanisms of a psychological intervention is important for clinicians to focus on the procedures that target those mechanisms to optimise outcomes, and for researchers to identify modifications to maximise the impact of those procedures (Domhardt et al., 2019). A key approach to understanding these mechanisms is identifying *mediators*: variables that change because of the intervention, and then lead to the change of targeted symptoms (Kazdin, 2007; Kraemer et al., 2002). However, few studies to date have examined mediators of GPD-CBT for child anxiety. For example, no GPD-CBT trials for child anxiety included in the Chapter 2 review further explored potential mediators of GPD-CBT outcomes. Although some studies have explored mediators in traditional therapist-led CBT programmes for child anxiety, it remains unclear to what extent these findings are applicable to GPD-CBT approaches.

The MY-CATS study introduced in Chapter 3 and 4 offers a valuable opportunity to expand our current understanding about the mediators of GPD-CBT for child anxiety, especially those delivered online, remotely, and/or targeting "at-risk" young children. Using quantitative data from the MY-CATS study, this chapter aimed to examine whether the child anxiety outcomes of the GPD-CBT programme evaluated in the MY-CATS study were mediated by child intolerance of uncertainty, child behavioural avoidance, child coping efficacy, parental overprotection, and parental self-efficacy.

Potential mediators

Child intolerance of uncertainty

Intolerance of uncertainty (IU) is defined as an individual's dispositional incapacity to endure an aversive response triggered by the perceived absence of salient, key, or sufficient information, and sustained by the associated perception of uncertainty (Carleton, 2016). There is evidence that IU is associated with elevated anxiety symptoms in clinical and non-clinical populations in adults and children (Counsell et al., 2017; Mathes et al., 2017;

Osmanağaoğlu et al., 2018; Ryan et al., 2025; Sexton & Dugas, 2009). For example, a meta-analysis of studies that investigated IU in youths found that IU accounted for 36% of the variance of anxiety (Osmanagaoglu et al., 2018). Focusing on younger children, a more recent longitudinal study conducted by Ryan et al. (2025) found that higher IU was consistently associated with higher anxiety levels when children was 3-4 years old (n=180), 5-7 years old (n=162), and 8-10 years old (n=148).

Given the observed association between IU and anxiety, Hebert & Dugas (2019) proposed a theoretical model to clarify the unique role of IU in the development and maintenance of anxiety and to provide a framework for targeting IU within CBT. Specifically, contextual attributes (i.e., ambiguity, novelty, unpredictability) trigger a state of uncertainty that, when misinterpreted as catastrophic, results in excessive anxiety, worry, and engagement in safety behaviours (e.g., avoidance); each phase of this cycle is compounded by dispositional IU, along with emotional state and life circumstances. Indeed, people who are intolerant of uncertainty are more likely to detect ambiguity in neutral situations and tend to perceive a vague and ambiguous situation as threatening. Such interpretation bias toward ambiguity and uncertainty can trigger more anxious affect, somatic reactions, and maladaptive behavioural responses (e.g., inaction and avoidance of ambiguous situations) (Dugas, Freeston, & Ladoucer, 1997; Greco & Roger, 2001, 2003).

Some key techniques of CBT, such as cognitive restructuring and graded exposure, can help individuals with high IU recognise their interpretation bias of ambiguity and uncertainty, test these interpretations in real-world situations, and develop more realistic and constructive interpretations to uncertain events originally perceived as threats, thereby reducing anxiety (Dugas et al., 1998; Carleton et al., 2016). Supporting this, multiple studies on CBT for adult anxiety have observed reductions in IU over the course of CBT, and these reductions have been associated with decreases in anxiety symptoms from pre- to post-intervention (Bomyea et al., 2015; Bosell et al., 2013; Stevens et al., 2018). However, only a few studies have examined changes in child IU in CBT for child anxiety. Palitz et al. (2019) found that in a therapist-led, child-focused individual CBT for children and adolescents (7-17 years) with anxiety disorders, a greater reduction in IU from pre- to post-treatment was associated with greater reduction of anxiety symptoms in children and adolescents from pre- to post-treatment. Sperling (2023) reported a significant reduction in child IU after a therapist-led, child-focused group CBT for children and adolescents (8-19 years) with anxiety disorders,

and this reduction was associated with greater reductions in children's anxiety symptoms. These findings suggest a potential mediating role of child IU in CBT for child anxiety. However, since changes in IU and child anxiety were measured concurrently in these studies, these findings cannot establish a causal relationship between the two variables. In addition, these studies were based on therapist-led child-focused CBT programmes for child anxiety so it remains unclear whether these findings generalise to GPD-CBT programmes, where all CBT techniques that may help children address negative interpretations of ambiguity and uncertainty (e.g., cognitive restructuring, graded explore) are implemented by parents with minimal therapist support.

Behavioural avoidance

Behavioural avoidance is defined as "any act or series of actions that enables an individual to avoid anticipated unpleasant or painful situations, stimuli, or events, including conditioned aversive stimuli" (American Psychiatric Association, 2018). In the context of child anxiety, it can be seen in anxious children's attempts to avoid or escape situations that may incite fear, worry, and negative affect (Gazelle & Rudolph, 2004; Lebowitze et al., 2015). According to the cognitive behavioural models of anxiety, behavioural avoidance play an important role in the development and maintenance of anxiety disorders (Beck, & Clark, 1997). Specifically, avoidance can limit individuals' exposure to challenging situations, preventing them from testing and modifying their anxiety-provoking cognitive biases (e.g., overestimating threats and underestimation coping abilities) based on experiences in real-world situations. It can also limit individuals' opportunities to practise adaptive coping strategies in real-world situations, gain successful coping experiences, build confidence in coping abilities. Consequently, anxious cognitive biases are reinforced, leaving individuals feeling overwhelmed by fears and worries in challenging situations and relying on avoidance as a primary coping strategy (Foa & Kozak et al., 1986; Jacobson et al., 2001; Salkovskis, 1991).

The association between behavioural avoidance and anxiety has been well-established both in adults and children (e.g., Grant et al., 2013; Lebowitz, 2017; Ollendick et al., 2001; Whiteside et al., 2013). Focusing on children, Whiteside et al., (2013), for example, found that a clinical sample (N=462; aged 8 to 12) diagnosed with at least one anxiety disorder showed significantly higher levels of behavioural avoidance than a community sample (N= 421; ages 7 to 18), and that, within the community sample, behavioural avoidance significantly predicted anxiety levels at least 8 months later.

A key technique of CBT is graded exposure, which is designed to reduce avoidant behaviours by guiding individuals to confront their fears in a gradually increasing hierarchy (Beck, 2005; Beck, & Clark, 1997; Beck et al., 1985). This process allows individuals to test their anxious thoughts in real-world situations, often leading to the realisation that situations are less threatening than expected. Exposure tasks also provide opportunities to gain positive feedback on coping efforts, build confidence in coping abilities, and practise adaptive coping strategies. As a result, when faced with similar anxiety-provoking situations in the future, individuals are more likely to respond with active, adaptive coping rather than feeling overwhelmed by fears and worries or resorting to avoidance.

Evidence has suggested that the inclusion of a graded exposure component is crucial for a CBT programme for child anxiety to be effective (Whiteside et al., 2020). In the GPD-CBT programme evaluated in the MY-CATS study, parents were also taught how to facilitate their child's fear testing using a graded exposure technique (i.e., step plans). Therefore, it is reasonable to hypothesise that the intervention could work on child anxiety through the mediating role of child avoidant behaviours. Multiple studies of therapist-led, child-focused CBT for child anxiety incorporating graded exposure technique have reported significant reductions in behavioural avoidance following the intervention (e.g., Baca et al., 2023; Essau et al., 2011; Peris et al., 2015; Whiteside et al., 2013). Some further suggested that such reductions in behavioural avoidance mediated the intervention effect on child anxiety (Baca et al., 2023; Essau et al., 2011). However, it is unclear whether these findings apply to GPD-CBT.

Coping efficacy

Coping efficacy refers to a global belief that one can deal with situational demands and the emotions aroused by situations (Bandura, 1988; Sandler et al., 2000). Low coping efficacy has been identified as an important factor in the development and maintenance of anxiety disorders (Alfano et al., 2002; Creswell & O'Connor, 2011; Water et al., 2008). Conceptually, children who do not believe that they can successfully cope in challenging situations are more likely to feel overwhelmed by fears and worries in those situations and display more avoidant behaviours. Such avoidance, as mentioned above, can limit their opportunities to practise more adaptive coping strategies, gain successful coping experiences, and build confidence in their coping abilities (i.e., coping efficacy). As a result, children may continue to

underestimate their coping abilities, rely on avoidance as their primary coping strategy, and feel overwhelmed by fears and worries in challenging situations (Chorpita & Barlow, 1998; Hogendoorn et al., 2014; Sander et al., 2000).

Empirical evidence has also supported the association between coping efficacy and anxiety in children (Chansky & Kendall, 1997; Torne et al., 2013; Weens et al., 2003). For example, in a sample of 117 children aged 9-17 years, Weens et al., (2003) found that children's lower perceived control over anxiety-provoking events was significantly related to their higher anxiety levels, and that clinically anxious children (n=86) reported lower perceived coping abilities than community children (n=31). In a larger non-clinical sample of 506 children aged 8-11, Torne et al., (2013) found that those who were more capable of managing anxiety-provoking situations using active coping strategies (e.g., problem-solving, planning, positive refocusing, coping restructuring) tended to show lower anxiety symptoms, but this association was mediated by children's coping efficacy toward anxiety-provoking situations.

Although coping efficacy is not directly targeted in CBT, a key goal of CBT for child anxiety, including the GPD-CBT programme evaluated in the MY-CATS study, is to help children reduce avoidance through graded exposure exercise and practise adaptive coping strategies in the process. Increased successful experiences in exposure exercises and the development of adaptive coping strategies may further help children enhance coping efficacy in anxiety-provoking situations, thereby reducing anxiety. Some evidence from traditional therapist-led, child-focused CBT for child anxiety has suggested that improvements in child coping efficacy may mediate CBT outcomes for child anxiety (Hogendoorn et al., 2014; Kendall et al., 2016; Pereira et al., 2017). For example, in a sample of 145 children (8-11 years) with anxiety disorders who received a therapist-led, child-focused individual CBT programme, Hogendoorn et al. (2014) found that children's perceived control in anxiety-provoking situations improved significantly during the intervention (after 8 of the 12 intervention sessions), and this improvement preceded a decrease of child anxiety symptoms post-intervention (after all 12 sessions). Similarly, in a sample of 215 children (7-17 years) with anxiety disorders randomly assigned to either a therapist-led, individual CBT programme or a placebo control group, Kendall et al. (2016) found that the intervention group (n=139), compared to the control group (n=76), showed significantly greater improvement in child and parent reported child coping efficacy in anxiety-provoking situation at 12 weeks, and that these improvements mediated child anxiety outcomes at 24

weeks. However, no study, to our knowledge, has examined whether GPD-CBT for child anxiety could improve child coping efficacy or whether GPD-CBT outcomes for child anxiety could be mediated by the improvement of child coping efficacy.

Parental overprotection and parental self-efficacy

Unlike therapist-led child-focused CBTs where therapists deliver the intervention directly to children (e.g., Luo & McAloon, 2021; van Starrenburg et al., 2013), all intervention materials and therapist input in GPD-CBT are directed at parents, aiming to empower parents to help children manage anxiety-provoking situations. In this context, changes in parental behaviours and beliefs may serve as key mechanisms of GPD-CBT outcomes for child anxiety. This chapter examined whether the child anxiety outcomes of the GPD-CBT programme evaluated in the MY-CATS study were mediated by two parent factors: parental overprotection and parental self-efficacy.

Parental overprotection

Characterised by parental excessive provision of protection considering the child's developmental level (Holmbeck et al., 2002), parental overprotection is the parenting dimension most consistently associated with child anxiety symptoms and disorders (Clark et al., 2013; Creswell & Waite, 2015; McLeod et al., 2007; Rapee et al., 2023; Van Der Bruggen et al., 2008). It is hypothesised that when parents attempt to "protect" their child by limiting the child's exposure to challenging situations or by helping the child avoid or manage difficult tasks, they may reinforce the child's anxious thoughts (e.g., "the world is dangerous" and "I am not able to cope"), increase the child's avoidant behaviours, and limit opportunities for the child to develop skills and confidence in managing challenging situations (Clark et al., 2013). Empirical evidence also supports a causal effect of parental overprotection on child anxiety, especially in preadolescent children (Buss et al., 2021; de Wilde & Rapee, 2008; Hudson & Dodd, 2012; Rapee et al., 2023: Thirlwall & Creswell, 2010). For example, two experimental studies—one with 4–5-year-olds (Thirlwall & Creswell, 2010) and another with 7–13-year-olds (de Wilde & Rapee, 2008)—found that children exhibited higher levels of observed anxiety when their parents behaved in a controlling manner, although in Thirlwall and Creswell (2010) this was only the case for children with higher trait anxiety. Longitudinal evidence also indicates that maternal overprotective behaviour in early childhood predicts children's increased anxiety symptoms one to five years later (Buss, Zhou, & Trainer, 2021; Hudson & Dodd, 2012).

Given the important role of parental overprotection in the development and maintenance of child anxiety disorders, it may be a useful target for the prevention and treatment of childhood anxiety disorders. Considering that, some therapist-led CBT, child-focused programmes for child anxiety have incorporated specific components for parents/carers to address anxiety-enhancing parenting behaviours such as overprotection (Manassis et al., 2014; Walker, 2012). Several studies of these programmes have reported significant reductions in parental overprotection (e.g., Jongerden & Bögels, 2015; Smith et al., 2014). Given the established association between parental overprotection and child anxiety, it's reasonable to hypothesise that such reductions in overprotective behaviours may contribute to the child anxiety outcomes of these programmes. Although the GPD-CBT programme evaluated in the MY-CATS study did not include a component specifically focusing on reducing parental overprotection, it provided parents with multiple adaptive strategies (e.g., graded exposure techniques) to support their child in managing anxiety-provoking situations, which may act as an alternative to more protective behaviours. Therefore, it is reasonable to hypothesise that the intervention could reduce parental overprotection, which would then contribute to its child anxiety outcomes.

To my knowledge, no study has examined the mediating role of parental overprotection in GPD-CBT for child anxiety. Morgan et al. (2017) examined whether an online GPD-CBT programme (e.g., *Cool Little Kids Online*) designed to reduce anxiety in young, inhibited children aged 3-6 years could reduce parental overprotection, but found no significant effects at either 12 weeks or 24 weeks after baseline. However, this finding may not generalise to the GPD-CBT programme evaluated in the MY-CATS study. For example, in the online GPD-CBT programme evaluated in Morgan et al. (2017) (*Cool Little Kids Online)*, therapist support was offered only on request rather than provided routinely. While the online GPD-CBT evaluated in the MY-CATS study offered parents with scheduled, regular therapist support via telephone/video calls throughout the intervention. This higher level of interactions with therapist may influence the degree of change in parental behaviours during the intervention.

Parental self-efficacy

Parental self-efficacy is defined as parents' belief that they can effectively manage parenting tasks (Johnston & Mash, 1989). Ardelt & Eccles (2001) proposed a conceptual model based

on the self-efficacy theory of Bandura (1997) to describe the reciprocal association between parental self-efficacy and child adjustment. In this model, parents with higher parental self-efficacy are more likely to be engaged in promotive parenting strategies and to demonstrate greater coping efforts and persistence in the face of adversity. These parenting behaviours increase the likelihood for their children's success in both academic and social-psychological domains, which subsequently reinforces and enhances parental self-efficacy. However, parents faced with challenging child behaviour problems may find it difficult to maintain high parental self-efficacy given the adverse results, whereas observing children's successes may strengthen it.

Consistent with this conceptional model, some previous studies have demonstrated the association between parental self-efficacy and different areas of child adjustment (e.g., child behaviours, socio-emotional adjustment, school achievement, and child maltreatment) (Jones & Prinz, 2005). Although limited, there is also evidence for a significant association between parental self-efficacy and child anxiety (Aminayi et al., 2015; Herren et al., 2013; Hill & Bush, 2001; Wheatcroft & Creswell, 2007). For example, in a community sample of 49 European American children (mean age=6.22, SD=0.37) and their parents, Hill & Bush (2001) found that parental self-efficacy was inversely related to child report of child anxiety. This study also found that parental self-efficacy was positively correlated with positive parenting practices (e.g., communication) and negatively related to negative parenting practices (e.g., inconsistent discipline, love withdrawal), indicating that parental self-efficacy may affect the development of child anxiety indirectly through parenting practices. Similarly, in a sample of 110 children aged 7-12 years (55 anxious children and 55 non-anxious children) and their mothers, Aminayi et al. (2015) found that mothers of anxious children reported significantly lower parental self-efficacy. These mothers also showed lower levels of accessibility, warmth, and responsiveness, along with higher levels of conflict in their parenting practices, suggesting that lower parental self-efficacy may relate to less positive parenting strategies, thereby contributing to the development of child anxiety. Although these cross-sectional studies cannot reveal the direction of the relationship between parental self-efficacy and child anxiety, their findings collectively align with the self-efficacy theory of Bandura (1997) and parental self-efficacy model proposed by Ardelt & Eccles (2001) that parents with low parental self-efficacy tend to show more negative parenting practices that may exacerbate child anxiety. Furthermore, the negative experience of parenting an anxious

child may reinforce parental dysfunctional beliefs about their parenting ability, perpetuating a vicious cycle of low parental self-efficacy and increased child anxiety.

Given the association between parental self-efficacy and child anxiety, parental self-efficacy may also be a useful target for the prevention and treatment of childhood anxiety disorders. Some studies of therapist-led, parent-involved CBT programmes for child anxiety have reported significant improvements in parents' perceived ability to deal with child anxiety following the intervention (Barrett et al., 1996; Dadds et al., 1997). However, no studies have further investigated whether such improvement mediate the intervention effects on child anxiety. Although the GPD-CBT programme evaluated in the MY-CATS study does not directly target parental self-efficacy, all the skills and strategies provided in the intervention might help improve parents' confidence in managing their child's anxiety, and thus enhance their overall parental self-efficacy. Given this, it is reasonable to assume that the intervention could improve parental self-efficacy, which would then contribute to its child anxiety outcomes. However, to my knowledge, no study has examined changes in parental self-efficacy in GPD-CBT programmes for child anxiety or its potential mediating effect.

Mediation analyses of longitudinal data

Identifying mediators is an important first step to understand the mechanisms of change of a psychological intervention (i.e., the actual processes responsible for therapeutic change) (Kazdin, 2007). A key requirement for establishing mediation is to demonstrate that the intervention causally influences change in an assumed mediator, which, in turn, causally influences change in the outcome variable. This requires a longitudinal design with more than two assessment points including at least one during the intervention, as two time points (e.g., preintervention and postintervention) cannot demonstrate whether change in the mediator preceded change in the outcome. Ideally, the mid-intervention assessment of the mediator should take place at a time point when its maximum change is expected to capture the intervention-induced change more accurately (Kazdin, 2007; Kraemer et al., 2002).

The MY-CATS study included five assessment points: a screening assessment to determine eligibility, a baseline assessment prior to randomisation, and three follow-up assessments at 6 weeks, 12 weeks, and 12 months post-randomisation. The primary outcome was the presence or absence of an anxiety disorder at 12 months. Secondary outcomes included anxiety

symptom levels at 12 weeks and 12 months. This chapter aimed to examine whether the above hypothesised mediators measured at 12 weeks post-randomisation mediated the association between group assignment (intervention or usual school practice) and child anxiety outcomes (i.e., absence/presence of an anxiety disorder and anxiety symptom levels) measured at 12 months post-randomisation. The 12 weeks was chosen as the mid-intervention mediator time point because the online GPD-CBT programme evaluated in the MY-CATS study consisted of seven online modules released to parents/carers weekly, each followed by a scheduled telephone or video call with a therapist. Although parents/carers were encouraged to complete one module per week, they were also given the flexibility to proceed at their own pace. As such, by the 6-week assessment, many families might not yet have completed core CBT modules likely to affect the proposed mediators (e.g., testing fears using graded exposure techniques in Module 3). Assessing mediators at 12 weeks provided more time for families to engage with and complete these key components, thereby increasing the likelihood of capturing meaningful changes in the mediators of the intervention.

Method

Procedure, Participants, Intervention

The chapter used quantitative data collected in the MY-CATS study. The procedures, participant characteristics, and intervention details were the same as those described in the quantitative study presented in the Chapter three (see sections of *Procedure, Participants, Intervention*).

Measures

Child anxiety outcomes at 12 months

This chapter aimed to examine the mediators through which the intervention delivered in the MY-CATS study could prevent anxiety disorders (i.e., the absence/presence of an anxiety disorder diagnosis) and reduce anxiety symptom levels in children at 12 months post randomisation. **The absence/presence of an anxiety disorder diagnosis** was assessed by psychology graduates (blind to trial arm status and trained to a high level of inter-rater reliability) using the Anxiety Disorder Schedule-Child Version-Parent Interview (ADIS-P) (Silverman et al., 1996) via telephone/video call (Lyneham, & Rapee., 2005). Diagnoses and Clinical Severity Ratings (CSRs) were assigned based on the parent interview following

standard guidelines. Diagnoses were assigned if a child met the diagnostic criteria and CSRs were 4–8. Whether the child met diagnostic criteria for at least one anxiety disorder at 12-month post-randomisation was analysed as a binary outcome in this chapter. **Children's anxiety symptom levels** were assessed using the Preschool Anxiety Scale (PAS, Spence et al., 2001). The PAS consists of 28 items and for each item parents select a response that best describes their child using a 5-point Likert scale. Items are scored 0–4 and responses summed to produce a total score (range 0–112), with higher scores representing a higher level of child anxiety symptoms. The PAS demonstrated good internal consistency reliability at the 12 months post-randomisation assessment (*Cronbach's a* value=0.92).

Potential mediators at 12 weeks

This chapter examined whether the child anxiety outcomes of the intervention delivered in the MY-CATS study at 12 months post-randomisation were mediated by changes in each of the following five factors assessed at 12 weeks post-randomisation. All five factors were continuous variables assessed online through parent/carer-report scales. **Child intolerance of uncertainty** was assessed using the Responses to Uncertainty and Low Environmental Structure (RULES) (Sanchez et al., 2017). This scale includes 17 items for parents/carers to rate young children's responses to uncertainty and unstructured situations (scored 1-5). For each item, parents/carers rate how well the statement describes their child. The total scores of this scale range 17–85, with higher scores indicating a greater intolerance of uncertainty. The scale showed good internal consistency reliability 12 weeks post-randomisation (*Cronbach's a* value=0.95). **Child behavioural avoidance** was assessed using the Child Avoidance Measure-Parent version (CAMP) (Whiteside et al., 2013). This scale includes 8 items designed for parents/carers to assess a child's tendency to avoid anxiety-provoking situations on a 4-point scale (0 = never, almost never, or not an issue to 3 = almost always). Total scores for this scale range from 0–24, with higher scores indicating a greater degree of child behavioural avoidance. The scale also showed good internal consistency reliability 12 weeks post-randomisation (*Cronbach's a* value=0.92). **Child coping efficacy** was accessed online using an adapted version of the parent-report Coping Questionnaire (CQ-P), which was designed to measure parents' perceived children's ability to make him/herself less upset during each anxiety-provoking situation on a 7-point scale (1-7) (Kendall, 1994). On the original measure, parents rate their child's ability to cope in three anxiety-provoking situations identified before starting intervention. In the MY-CATS study, parents/carers were asked to provide 1-3 situations where their child feels scared or worried at baseline, and then

they were asked to rate how well their child was able to cope in each of these situations at all assessment points. At baseline, data were available for 840 of the 865 children (97.1%) on the first situation, 820 (94.8%) on the first two situations, and 767 (88.6%) on all three situations. At 12 weeks, data were available for 687 children (79.4%) on the first situation, 667 (77.1%) on the first two situations, and 574 (66.3%) on all three situations. To maximise the sample size for mediation analyses, this chapter used parents/carers' responses on the first situation (an item scored 1 to 7) for analyses, with higher scores representing a higher degree of parents' perceived child coping efficacy. **Parental overprotection** was assessed using the Parent Overprotection Scale (Clarke et al., 2013). This scale included 19 items designed to assess parenting behaviours that may restrict a child's exposure to situations that may be perceived as potentially threatening or harmful. Parents/carers rate each item on 5-point (0–4) scale and responses are summed to produce a total score (0–76), with higher scores representing a higher degree of parental overprotection. The scale showed good internal consistency 12 weeks post-randomisation (*Cronbach's a* value=0.90). **Parental self-efficacy** was assessed online using the 7-item self-efficacy subscale of the Parenting Sense of Competence Scale (PSOC-SE) (Johnston & Mash, 1989). Parents/carers were asked to rate the extent to which they agree or disagree with 7 statements on a 6-point scale (1 = Strongly Disagree to 6 = Strongly Agree). Items were summed to provide a total score (range 7–42), with higher scores reflecting higher parental self-efficacy. The scale also showed good internal consistency 12 weeks post-randomisation (Cronbach's a value=0.87). The scale also showed good internal consistency 12 weeks post-randomisation (Cronbach's a value=0.87).

Baseline covariates

For the analysis of each mediator, a broad range of baseline demographic variables reported by parents/carers were included as covariates including child age (in years); child gender (female versus male versus other); child and parent/carer ethnicity (White British versus others); parent/carer relationship with child (mother versus father versus other); parent/carer partner cohabiting status (cohabiting with a partner or not); parent/carer education level (having an undergraduate degree or above or not); parent/carer employment status (full-time employed or not); family socioeconomic background measured using index of multiple deprivation score (more or less deprived)[7].

7 The Index of Multiple Deprivation (IMD) is a measure of relative deprivation for small, fixed geographic areas of the UK. The index is calculated based on seven different domains, or facets, of deprivation: income deprivation, employment deprivation, education, skills and training deprivation, health deprivation and

In addition to the above demographic variables, all mediation models were also adjusted for the baseline level of the mediator under examination and child anxiety symptoms measured using PAS total scores. This allowed for isolating the intervention's effect on the mediator at 12 weeks post-randomisation, as well as its direct and indirect effects on child anxiety outcomes at 12 months. The PAS and all multiple-item scales for potential mediators demonstrated good internal consistency reliabilities at baseline (*Cronbach's a* value ranged from 0.83 to 0.93).

It is also important to note that the MY-CATS study employed a "targeted prevention" approach, enrolling children identified as at risk of anxiety disorders based on at least one of the three risk factors: child elevated anxiety symptoms, behavioural inhibition, elevated parent/carer anxiety. To account for variability in these risk factors and minimise their potential confounding effects, the baseline levels of child behavioural inhibition and parent/carer anxiety levels were also included as covariates in all mediation analysis models, alongside baseline child anxiety symptoms. Child behavioural inhibition was assessed using a 7-item parent/carer-report approach subscale of the Short Temperament Scale for Children (STSC-A, scored 1-6 with 4 reverse items, Prior et al., 1987; Sanson et al., 1996). Parent/carer anxiety levels were assessed online using a 7-item self-report Generalised Anxiety Disorder Scale (GAD-7, scored 0-4, Spitzer et al., 2006). Both scales showed good internal consistency at baseline (*Cronbach's a* value = 0.87, 0.89, respectively).

Finally, given the randomisation procedure in the MY-CATS study was conducted at the school level, to take account of the balance between the intervention and control groups in terms of school deprivation level (above/below national average of 15.8% for percentage of pupils eligible for free school meals)[8] and the number of recruited children in each school

disability, crime, barriers to housing and services, living environment deprivation. Families in the MY-CATS study were categorised into 10 ordinal categories based on their index of multiple deprivation (IMD), ranking from 1 (families from the bottom 10% of the most deprived areas in UK) to 10 (families from the top 10% of the least deprived areas in UK). 'More deprived families' were defined as families at the bottom 20% of the most deprived areas in UK (IMD ≤ 20%), the remaining 80% were categorised as 'less deprived families'.

8 Free school meals (FSM) in the UK provide eligible students with a daily healthy school meal at no cost. This initiative supports children from low-income families. National average FSM in 2019 = 15.8%. In the MY-CATS study, the percentage of children eligible for free school meals in 50 out of the 95 participating schools were below the national average of 15.8%.

(cluster size)[9], this chapter included these two school-level demographic variables in each mediation model as covariates to reflect their roles in the randomisation process. School deprivation level, collected from the Department for Education website, was included in the models as a binary covariate. Cluster size of each school was included in the models as a continuous covariate.

Data analysis

Mediation analysis: For each child anxiety outcome (the absence/presence of an anxiety disorder diagnosis and child anxiety symptom levels), I first examined if the intervention showed a significantly greater effect compared to the usual school practice group at 12-month post-randomisation, without adjusting for any mediators. Mediation analyses for a given outcome were conducted only if a significant intervention effect was observed ($p < 0.05$). These preliminary analyses were conducted in an SEM software package, Mplus 7.4. For the categorical outcome (absence/presence of an anxiety disorder diagnosis), a two-level logistic analysis was employed using two-level weighted least squares estimation, with a random intercept at the school (cluster) level. For the continuous outcome (child anxiety symptom levels), a two-level regression analysis was used using two-level maximum likelihood estimation, with a random intercept at the school (cluster) level. Both models were controlled for child baseline anxiety symptoms and behavioural inhibition, parent/carer baseline anxiety, individual- and school-level demographic variables (see Fig 5.1).

[Insert Fig 5.1 here]

If a significant intervention effect was observed for an outcome, each potential mediator was examined individually within a path analysis framework in Mplus 7.4. As shown in Fig 5.2, the mediator under examination, measured at baseline and 12-week post-randomisation, was added into the model presented in Fig 5.1. Path **a** represents the effect of group assignment on the mediator at 12-week post randomisation. Path **b** represents the predictive effect of the mediator measured at 12 weeks on the child anxiety outcome at 12 months. Path **c'** represents the direct effect of group assignment on child anxiety outcome measured at 12 months. The product of the a and b paths (denoted by **ab**) represents the indirect effect of group assignment on child anxiety outcome at 12 months through the mediator at 12 weeks. The baseline measures of the mediator, child anxiety symptoms, child behavioural inhibition,

9 In the MY-CATS study, the number of participating children recruited from each school (cluster size) ranged from 1 to 24.

parent/carer anxiety, and a range of individual- and school-level demographic variables were incorporated in the model as covariates. All continuous variables were mean-centered. The unstandardised parameter estimates of direct paths (a, b, c') and the indirect path (ab), along with standard error (SE) estimates, are presented. For each path, the effect was considered significantly if p value < 0.05.

[Insert Fig 5.2 here]

Missing data: All data analyses were first undertaken following the intention-to-treat principle, including all participants randomised to the intervention and control groups in the MY-CATS study. Missing data were handled using a multiple imputation approach. Prior to imputation, a "scaling up" process was applied. Specifically, if a participant did not complete all items of a multi-item measure, the missing items were estimated based on the average score of the non-missing items. Each measure had a minimum threshold for the number of completed items required to validly extrapolate the total score (see Appendix 2). If the number of completed items fell below this threshold, the participant's data for that measure was considered missing.

After applying the "scaling up" process, 243 out of the 865 randomised children (28.09%) didn't have data on the absence/presence of an anxiety disorder diagnosis and 230 children (26.59%) didn't have data on anxiety symptoms at 12 months post-randomisation. In terms of data missing on potential mediators at 12 weeks, 166 children (19.19%) did not have data on intolerance of uncertainty, 165 (19.08%) did not have data on behavioural avoidance, 178 (20.58%) did not have data on coping efficacy, 168 (19.42%) did not have data on parental overprotection, 168 (19.42) did not have data on parental self-efficacy. There was also a small amount of missing data on baseline covariates, including 4 (0.46%) on child ethnicity, 11 (1.27%) on parent/carer ethnicity, 10 (1.16%) on parent/carer partner cohabiting status, 54 (6.24%) on parent/carer employment status, 21 (2.42%) on parent/care education level, 7 (0.81%) on child intolerance of uncertainty, 7 (0.81%) on child behavioural avoidance, 25 (2.89%) on coping efficacy, 12 (1.39%) on parental overprotection, 12 (1.39%) on parental self-efficacy.

Attrition analyses, using chi-square tests, were conducted for two child anxiety outcomes (i.e., child anxiety symptoms and child anxiety diagnosis at 12 months), respectively. Attrition rates were similar between the intervention and usual practice groups on two child anxiety outcomes in the overall sample. No significant associations were identified between

baseline or 12-week mediator measures and the missingness of child anxiety outcomes. However, there were some significant associations between baseline covariates and the missingness of child anxiety outcomes. For both outcomes, higher attrition rates were observed in parent/carers who were not cohabiting with a partner, had a lower education level, reported elevated anxiety themselves at baseline, compared to those who were cohabiting with a partner, had an undergraduate degree or above, and did not report elevated anxiety themselves at baseline.

Missing data were imputed in Mplus 7.4 using a two-level model to account for clustering in the data by including random effects at the school level. Bayesian estimation was applied to estimate the model. A total of 50 imputed data sets were generated and subsequently used for mediation analyses. The results of identical analysis on each imputed data set were combined using Rubin's rules, whereby parameter estimates were averaged over the set of analyses, and standard errors were computed using the average of the standard errors over the set of analyses and the between analysis parameter estimate variation (Rubin, 1987; Schafer, 1997).

After conducting the intention-to-treat analyses, complete case analyses were performed to examine sensitivity of the findings to methods used for handling missing data. The intervention effect on each child anxiety outcome at 12 months was re-evaluated among participants with complete data on the outcome. If a significant intervention effect was observed, each potential mediator was examined individually among participants with complete data on the outcome and the mediator at baseline and 12 weeks. Among participants included in these complete case analyses, a small amount of missing data remained for certain baseline covariates, including child and parent/carer ethnicity, parent/carer partner status, education level, employment status. These missing data were addressed using the full information maximum likelihood (FIML) method in Mplus 7.4.

Results

Mediators of child anxiety diagnosis outcomes at 12 months

As shown in Table 5.1, both intention-to-treat and complete case analysis showed that after adjusting for child anxiety symptoms, behavioural inhibition, parent/carer anxiety, multiple individual- and school-level demographic factors at baseline, group assignment did not

significantly predict children's presence/absence of an anxiety disorder diagnosis at 12 months post randomisation ($p>0.05$). As discussed in Chapter 3 (see the *Discussion* section of Chapter 3), this is likely because the MY-CATS study targeted children who were at risk for developing anxiety disorders rather than those had current anxiety disorders, so relatively few children met diagnostic criteria for an anxiety disorder at 12 months regardless of group assignment. This low incidence of anxiety disorders in the study sample reduced the statistical power to detect intervention effects in preventing anxiety disorders, as well as meaningful mediation effects for this outcome.

[Insert Table 5.1 here]

Mediators of child anxiety symptom outcomes at 12 months

As shown in Table 5.1, both the intention-to-treat and complete case analyses showed that after adjusting for child anxiety symptoms, behavioural inhibition, parent/carer anxiety, multiple individual- and school-level demographic factors at baseline, group assignment significantly predicted children's anxiety symptom levels at 12 months. The intervention group showed significantly lower anxiety symptom levels than the usual school practice group. Therefore, mediation analyses were conducted for this outcome.

As shown in Table 5.2, both intention-to-treat and complete case analyses indicated a significant indirect intervention effect on the child anxiety symptom outcome at 12 months through the change in child intolerance of uncertainty, child coping efficacy, and parental overprotection at 12 weeks (ab). Compared to the usual school practice group, the intervention showed a significantly greater effect in reducing children's intolerance of uncertainty, improving children's behavioural avoidance, reducing parental overprotection at 12 weeks (path a), and all these changes significantly predicted children's lower anxiety symptoms at 12 months (path b). Furthermore, the direct intervention effect on the child anxiety symptom outcome at 12 months (path c') remained significant after these three mediators were modelled, indicating only partial mediating roles of child intolerance of uncertainty, child behavioural avoidance, and parental overprotection.

[Insert Table 5.2 here]

Regarding the mediating role of child behavioural avoidance, intention-to-treat and complete case analyses yielded inconsistent results. The complete case analysis revealed a significant indirect intervention effect on child anxiety symptoms at 12 months through the change in

child behavioural avoidance at 12 weeks (ab). The intervention showed a significant effect in reducing child behavioural avoidance at 12 weeks (path a) compared to the usual school practice group, and children's lower behavioural avoidance at 12 weeks significantly predicted their lower anxiety symptom levels at 12 months (path b). Furthermore, the direct pathway to child anxiety symptoms at 12 months (path c') also remained significant after child behavioural avoidance was modelled, indicating only a partial mediating role of child behavioural avoidance among children with available data on child anxiety symptom outcomes at 12 months and behavioural avoidance at baseline and 12 weeks. In contrast, intention-to-treat analysis indicated no significant indirect intervention effect on the child anxiety symptom outcome at 12 months through the change in child behavioural avoidance at 12 weeks (ab). Group assignment did not significantly predict child behavioural avoidance at 12 weeks (path a), although lower behavioural inhibition at 12 weeks was found to significantly predict lower anxiety symptom levels at 12 months (path b).

Neither intention-to-treat analysis nor complete case analysis indicated a significant indirect effect on child anxiety symptoms at 12 months through change in parental self-efficacy (ab). According to the intention-to-treat analysis, group assignment did not significantly predict parental self-efficacy at 12 weeks (path a); parental self-efficacy at 12 weeks also did not significantly predict child anxiety symptoms at 12 months (path b). According to the complete case analysis, although parental self-efficacy at 12 weeks was significantly predicted by group assignment (path a) and significantly predicted child anxiety symptoms at 12 months (path b), the indirect effect (ab) did not research statistical significance.

Discussion

This chapter examined several potential mediators (i.e., child intolerance of uncertainty, child behavioral avoidance, child coping efficacy, parental overprotection, parental self-efficacy) through which the GPD-CBT evaluated in the MY-CATS study may reduce anxiety symptoms in young children (4-7 years) identified as at risk of anxiety disorders. There was some evidence for the mediating role of child intolerance of uncertainty, behavioural avoidance, coping efficacy, and parental overprotection, but not for the mediating role of parental self-efficacy.

Child intolerance of uncertainty, behavioural avoidance, coping efficacy

Previous research has highlighted child intolerance of uncertainty (IU) as a key role in the development and maintenance of child anxiety (Osmanagaoglu et al., 2018; Ryan et al., 2025). Children with high IU are more likely to detect ambiguity in neutral situations and tend to perceive vague or ambiguous situations as threatening. This interpretation bias of uncertainty can trigger anxious responses (Hebert & Dugas, 2019). Core CBT techniques such as cognitive restructuring and graded exposure may help children with high IU recognise and modify those negative interpretations of ambiguity and uncertainty, thereby reducing anxiety (Dugas et al., 1998; Carleton et al., 2016). Supporting this, several studies of therapist-led, child-focused CBT for child anxiety have found reductions in child IU over the course of intervention and have linked such reductions with concurrent reductions in child anxiety (Palitz et al., 2019; Sperling, 2023). Consistent with that, the current study provided preliminary evidence that GPD-CBT can also effectively reduce child IU. Furthermore, the longitudinal design of this study revealed that reductions in child intolerance of uncertainty during the intervention contributed to subsequent decreases in child anxiety symptoms. Taken together, these findings suggest that child intolerance of uncertainty is an important therapeutic target in GPD-CBT programmes for child anxiety. Future studies should further investigate what components of GPD-CBT could drive reductions in child intolerance of uncertainty, so that future GPD-CBT programmes for child anxiety can target those components and maximise their impacts to improve intervention effectiveness.

Previous studies have also highlighted behavioural avoidance and coping efficacy as key factors in the development and maintenance of anxiety disorders. Anxious individuals tend to overestimate threats in situations and underestimate their ability to cope (i.e., low coping efficacy). These cognitive biases can trigger avoidant behaviours, which limit individuals' exposure to challenging situations, thereby preventing them from realising that feared outcomes may not occur or may be less severe than anticipated. Behavioural avoidance also reduces individuals' opportunities to practise adaptive strategies in real-world situations, gain successful coping experiences, build confidence in coping abilities (i.e., coping efficacy). Consequently, maladaptive cognitive biases are reinforced, leaving individuals feeling overwhelmed by fears and worries in challenging situations and reliant on avoidance as a primary coping strategy (Beck, & Clark, 1997; Foa & Kozak et al., 1986; Jacobson, Martell, & Dimidjian, 2001; Salkovskis, 1991). Some core CBT techniques can help individuals reduce behavioural avoidance and improve coping efficacy. For example, graded exposure is designed to address avoidant behaviours by guiding individuals to test anxious thoughts in

real-world situations, often leading to the realisation that situations are less threatening than expected and they are capable of coping (i.e., increased coping efficacy). Exposure tasks also provide opportunities to develop adaptive coping strategies (e.g., problem-solving), gain successful coping experiences, and build confidence in coping abilities (i.e., increased coping efficacy). Evidence from some therapist-led, child-focused CBT programmes for child anxiety have suggested that reducing child behavioural avoidance and improving child coping efficacy are key mechanisms through which CBT reduces child anxiety (Essau et al., 2011; Hogendoorn et al., 2014). Consistent with that, the present study provided preliminary evidence that GPD-CBT can also effectively reduce child behavioural avoidance and improve child coping efficacy, thereby reducing child anxiety. Future research should further investigate which components of GPD-CBT may contribute these mechanisms of change, so that future GPD-CBT programmes can focus on those components and optimise their implementation to improve intervention outcomes.

Parental overprotection

Extensive evidence has suggested that excessive parental protection beyond children's developmentally appropriate levels is associated with higher anxiety symptoms in children (Clark et al., 2013; Creswell & Waite, 2015). Some therapist-led CBT programmes for child anxiety have paid attention to this risk factor by incorporating specific components that help parents reduce maladaptive parenting behaviours including overprotection and have shown positive effects (Manassis et al., 2014; Mayer-Brien et al., 2017; Smith et al., 2014). Although the GPD-CBT programme evaluated in the MY-CATS study did not include a component specific targeting parental overprotection, this study still found a reduction in parental overprotection during the intervention, which contributed to subsequent reductions in child anxiety. One possible explanation is that, although the intervention did not directly target parental overprotection, it equipped parents with adaptive strategies (e.g., cognitive restructuring, graded exposure) to help their child manage anxiety, which may serve as alternatives to protective behaviours. Future research could further investigate this possibility by identifying changes in parental responses to child anxiety during the intervention, the processes through which these changes occur, and how they may contribute to reductions in parental overprotection.

It is also interesting to note that the significant reduction of parental overprotection observed in this study was inconsistent with the findings of Morgan et al., (2017), in which another online parent-delivered CBT programme with remote therapist support (available only upon parent request via telephone) targeting young, inhibited children aged 3-6 years showed minimal effects in reducing parental overprotection. Several factors may help explain this discrepancy. First, the GPD-CBT programme evaluated in the MY-CATS study provided regular therapist support through telephone/video calls. However, in the GPD-CBT programme evaluated in Morgan et al. (2017), therapist telephone support was available only upon parent request, and only 5.1% of parents requested a support call. The difference in therapist involvement may help account for the differing intervention effects in reducing parental overprotection. Secondly, in Morgan et al. (2017), only 24.9% of parents in the intervention group accessed to all the eight modules of the intervention. However, the content specifically targeting parental overprotection began from the fourth module. Some parents may not have received an adequate dose to realistically achieve change in parenting behaviours. However, in the MY-CATS study, over 70% of parents in the intervention group completed all the online modules and all therapist support calls. Such high intervention adherence may have contributed to greater changes in parenting behaviours. Third, parents in Morgan et al. (2017) reported slightly lower baseline overprotection (mean = 1.71 vs. 1.87) than parents in the MY-CATS study, and their children were slightly younger (mean age 4.8 vs. 6.2 years). The lower parental overprotection in Morgan et al. (2017) was more developmentally appropriate for its younger children sample, which may have also contributed to smaller intervention effects in reducing parental overprotection. Taken together, these inconsistent findings suggest that whether a GPD-CBT programme could reduce child anxiety through reducing parental overprotection may depend on the intervention design (e.g., therapist involvement), implementation (e.g., adherence), and sample characteristics (e.g., child age). Future research should further explore under what conditions and for which populations GPD-CBT can effectively reduce parental overprotection, thereby contributing to reductions in child anxiety. Such knowledge could inform the optimisation of future GPD-CBT programmes to maximise the impact of this mechanism.

Parental self-efficacy

This chapter found no evidence for the mediating role of parental self-efficacy in the GPD-CBT programme evaluated in the MY-CATS study. This finding was inconsistent with my initial hypothesis that the skills and strategies provided in the intervention might help improve parental self-efficacy, which may lead to improved parenting practices and, in turn, reductions in child anxiety. One possible explanation is that the measure of parental self-efficacy used in the MY-CATS study primarily assessed parents' general sense of competence in the parenting role, rather than their specific self-efficacy in managing child anxiety. Some previous studies on therapist-led CBT programmes that included sessions for parents aimed at helping them manage their child's anxiety have reported improvements in parents' specific self-efficacy in managing child anxiety during the intervention (Barrett et al., 1996; Dadds et al., 1997). However, parenting encompasses a broad range of responsibilities. While parents may feel more confident in managing child anxiety soon after the intervention, it may take longer for this confidence to generalise across broader parenting domains and influence child outcomes (e.g., anxiety). This potential delay in effect may make it harder to detect the mediating role of parental self-efficacy at 12 weeks post-randomisation on child anxiety outcomes measured at 12 months. Future studies examining the mediating role of parental self-efficacy in GPD-CBT programmes for child anxiety should consider measuring parents' specific self-efficacy in managing child anxiety or investigate its potential mediating effect over extended follow-up periods.

Strengths and limitations

This chapter presented a quantitative study examining potential mediators through which the GPD-CBT programme evaluated in the MY-CATS study could reduce child anxiety symptoms. The large sample size (n = 865) enhanced the reliability of the findings. The inclusion of a non-active control group (i.e., usual school practice) in mediation analyses enabled more rigorous testing of whether changes in mediators were directly attributable to the intervention itself, rather than to natural developmental changes and external influences over time. A longitudinal design was adopted in the mediation analyses, allowing investigation of the temporal sequence between changes in potential mediators attributable to the intervention (assessed at 12 weeks) and subsequent child anxiety outcomes (assessed at 12 months). Reporting the results from both intention-to-treat and complete-case analyses allowed for sensitivity testing regarding the handling of missing data in the intention-to-treat analyses (via multiple imputation).

Despite above strengths, a number of limitations should be considered when interpreting the findings of this chapter. First, sample sizes were limited in certain subgroups, which may affect the generalisability of the result. For instance, most participating parents/carers were mothers (92.8%), and the majority of children and parents/carers were White British (81.7% of children; 80.9% of parents/carers). Given that, caution is needed when applying study findings to children whose father was the primary participating parents/carer, as well as non-White British children and families. Similarly, because data on the neurodiversity of participating children (e.g., the presence of autism or ADHD) were not collected, it remains unclear whether the mediation effects identified in this study can be generalised to neurodivergent children and their parents.

Second, the timing of assessments in this chapter may have limited the ability to detect delayed or longer-term mechanisms of change. For example, as noted above, parental self-efficacy may not increase immediately after exposure to an intervention component but may develop over time as parents apply the strategies in daily life and observe effectiveness. A single 12-week assessment may miss such potential delayed effects. Moreover, focusing on child anxiety outcomes at 12 months, this chapter could only explore mechanisms operating within the first year following the intervention. Future studies should incorporate extended follow-up periods to capture delayed mediator changes and identify factors contributing to the maintenance of intervention gains.

Third, mediation analyses in this chapter were based on three assessment points, which only allowed for the examination of linear change. However, symptom reduction does not always follow a linear trajectory (Hayes et al., 2007). The greater the measurement frequency, the better researchers can determine temporal sequencing (Kazdin, 2007) and the timing and shape of change (Hayes et al., 2007). In addition, adding assessments at key stages of the intervention (e.g., such as after the completion of specific online modules in the MY-CATS study) could help link specific mechanism of changes to particular intervention components, thereby informing the optimisation of intervention design and delivery.

Fourth, this chapter reported mediation analysis results based on both intention-to-treat and complete-case approaches. While most findings were consistent across the two approaches, the mediating role of child behavioural avoidance was observed only in the complete-case

analyses. One possible explanation is that the use of multiple imputation to handle missing data in the intention-to-treat analyses may have diluted effect estimates on the mediators and reduced the sensitivity to detect mediation effects. However, complete-case analyses included only participants with complete data, therefore, the results may reflect mediation effects within this complete-data subsample rather than the full trial population. For example, in the MY-CATS study, attrition analysis showed that parents/carers who were not living with a partner, had lower educational qualifications, or exhibited elevated anxiety at baseline were more likely to drop out. Consequently, the study findings may be more representative of parents/carers who were cohabiting with a partner, held an undergraduate degree or higher, and did not have elevated baseline anxiety. Furthermore, since participants with poorer outcomes may be more likely to drop out, complete-case analyses may overestimate intervention effects on mediators and child anxiety outcomes, and, as a result, generate spurious mediation effects. Future research could further explore whether attrition is linked to changes in certain mediators, such as whether individuals showing greater improvement in a mediator during the intervention are less likely to drop out, which could deepen understanding of the mediation pathways.

Fifth, as a secondary data analysis of the MY-CATS study, this study was limited to examining the mediators assessed in the MY-CATS study. However, previous studies on therapist-led, child-focused CBT programmes for child anxiety have identified some other factors that may mediate intervention outcomes, such as threat interpretation bias—characterised by a tendency to interpret ambiguous situations as threatening (Pereira et al., 2018)—and positive coping strategies (e.g., positive cognitive restructuring, problem-solving strategies; Hogendoorn et al., 2014). Future studies could further explore whether these factors also play a mediating role in GPD-CBT programmes for child anxiety. In addition, this chapter examined each mediator independently, without accounting for potential sequential or parallel relationships among them. However, mediators may operate in combination, either sequentially or concurrently (sequential and parallel mediation; Vo et al., 2020). In a sequential mediation model, one mediator may influence the next in a causal chain. For example, in the MY-CATS study, the intervention might first reduce parental overprotection, which in turn could decrease child avoidance, ultimately leading to reduced anxiety symptoms. In parallel mediation models, mediators operate simultaneously, and the presence of one may amplify or diminish the effect of another. Future research should

examine these potential interrelationships to gain a more comprehensive understanding of the intervention's mechanisms of change.

Findings of this study should also be interpreted with caution due to measurement-related biases. Specifically, all mediation analyses in this study were conducted on parent-reported child anxiety symptom outcomes (i.e., the Preschool Anxiety Scale, PAS, Spence et al., 2001). As discussed in the *Strengths and limitation* section in Chapter 3, this parent-reported outcome has its limitations. In addition, similar to the measure of child anxiety symptoms, all child factors examined as mediators in this study, including child intolerance of uncertainty, behavioural avoidance, coping efficacy, were also reported by parents. This not only increases the risk of common method bias, but also means that these measure outcomes primarily reflect parents' perceptions of these child factors based on their observations, which may not fully capture the children's actual performance. For example, coping efficacy is intended to capture children's self-perceived ability to cope in anxiety-provoking situations. Although parents can infer this confidence by observing their child's behaviour in challenging situations, and evidence suggests strong agreement between parent-reported and child self-reported coping efficacy (Crane & Kendall, 2020), parent reports may not fully capture children's subjective perceptions of their own coping ability.

Finally, the quantitative design of this study can only examine certain pre-hypothesised mediators. It cannot identify novel mediators perceived by participants or reveal which specific intervention components contribute to changes in the mediators. Future qualitative studies could help answer these questions by exploring participants' experiences and perspectives, thereby offering valuable insights to inform the design and delivery of future similar interventions.

Conclusion

This chapter examined whether child intolerance of uncertainty, child behavioural avoidance, child coping efficacy, parental overprotection, and parental self-efficacy mediated the child anxiety outcomes of an online parent-delivered CBT programme among young children (4-7 years) identified at risk of anxiety disorders. Findings suggested that the intervention effectively reduced child intolerance of uncertainty, behavioural avoidance, and parental overprotection while improving child coping efficacy at 12 weeks post-randomisation. These

changes, in turn, contributed to reductions in child anxiety symptoms at 12 months. However, no evidence was found for a mediating role of parental self-efficacy. Keeping in mind the limitations discussed above, findings of this chapter provided preliminary evidence for the underlying mechanisms through which GPD-CBT programmes could reduce child anxiety, particularly those delivered online, remotely, and/or targeting “at-risk” young children. Future research should further explore which intervention components drive these mechanisms and how best to deliver them to optimise outcomes.

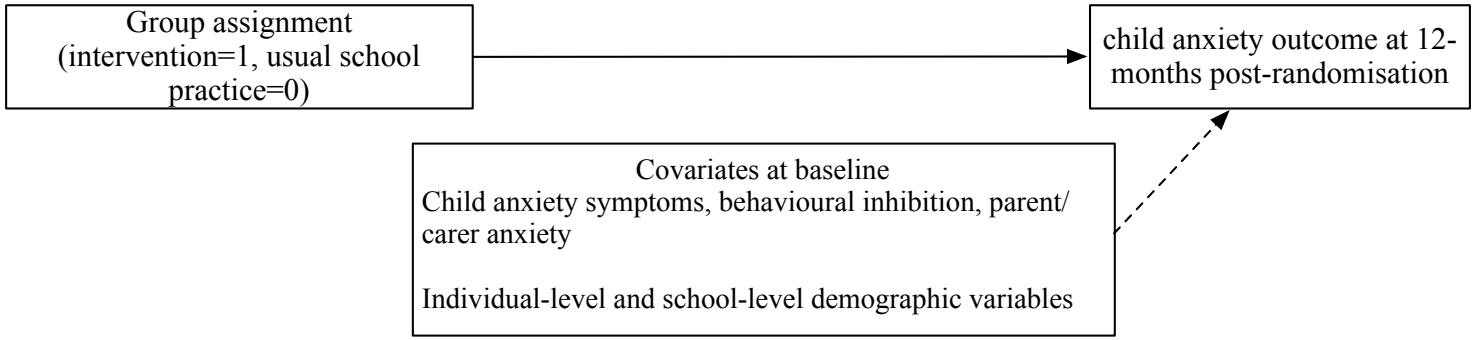

Fig 5.1 Model for intervention effect analysis

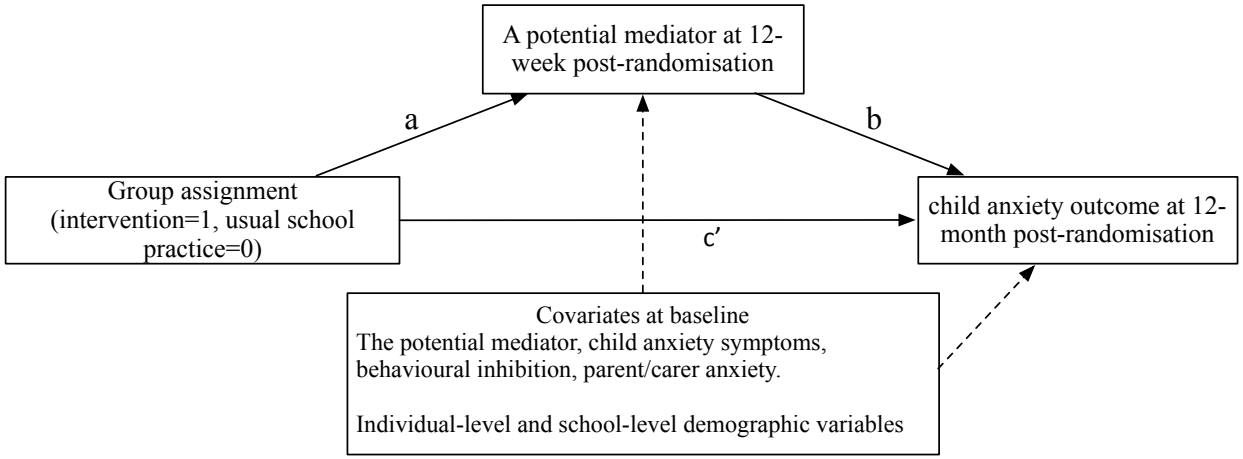

Fig 5.2. Model of mediation path analysis

Table 5.1. Child anxiety outcomes of the intervention compared to usual school practice group at 12 months post randomisation.

Outcomes	Unstandardised parameter estimate of group assignment on child anxiety outcome[1]		
	b[2]	se[2]	p value[2]
Presence/absence of an anxiety disorder diagnosis			
Intention-to-treat analysis[3] (n=865)	-4.244	1.219	0.001
Complete case analysis[4] (n=635)	-6.171	0.960	0.000
Child anxiety symptom levels			
Intention-to-treat analysis (n=865)	-4.103	1.251	0.001
Complete case analysis (n=623)	-6.083	1. 053	0.000

*Note:*1. As shown in Fig 5.1, all the unstandardised parameter estimates were calculated after adjusting child anxiety symptoms, behavioral inhibition, parent/carers anxiety, multiple individual- and school-level demographic factors at baseline. Group assignment was coded as intervention group=1, usual school practice group=0.

2. b=unstandardised parameter estimate; se= standard error estimates; p value indicates significance if < 0.05.
3. Intention-to-treat analysis included all participants randomised to the intervention and usual school practice group.
4. Complete case analysis included participants with available data on the outcome under examination.

Table 5.2. Results of mediation analyses for child anxiety symptom outcomes at 12 months post randomisation.

Mediators	Indirect (ab)[1] path			a path[1]			b path[1]			c' path[1]		
	b[2]	se[2]	p[2]	b	se	p	b	se	p	b	se	p
Child intolerance of uncertainty												
Intention-to-treat analysis[3] (n=865)	-0.960	0.411	0.000	-3.098	1.110	0.005	0.310	0.069	0.000	-4.244	1.219	0.001
Complete case analysis[4] (n=600)	-2.387	0.482	0.000	-4.516	0.725	0.000	0.528	0.069	0.000	-6.171	0.960	0.000
Child behavioural avoidance												
Intention-to-treat analysis (n=865)	-0.771	0.607	0.204	-1.281	1.117	0.275	0.632	0.219	0.004	-4.194	1.228	0.001
Complete case analysis (n=600)	-1.492	0.415	0.000	-1.719	0.377	0.000	0.868	0.120	0.000	-6.112	0.916	0.000
Child coping efficacy												
Intention-to-treat analysis (n=865)	-0.930	0.328	0.000	0.584	0.107	0.000	-1.595	0.485	0.001	-4.134	1.220	0.001
Complete case analysis (n=589)	-1.599	0.407	0.000	0.756	0.101	0.000	-2.115	0.452	0.000	-6.191	0.930	0.000
Parental overprotection												
Intention-to-treat analysis (n=865)	-0.966	0.421	0.022	-5.542	0.743	0.000	0.174	0.072	0.015	-4.123	1.228	0.001
Complete case analysis (n=598)	-1.986	0.502	0.000	-6.098	0.680	0.000	0.326	0.067	0.000	-6.097	0.936	0.000
Parental self-efficacy												
Intention-to-treat analysis (n=865)	-0.365	0.550	0.507	1.366	1.800	0.448	-0.269	0.182	0.139	-4.103	1.251	0.001
Complete case analysis (n=598)	-0.755	0.519	0.146	1.741	0.653	0.008	-0.434	0.176	0.014	-6.083	1. 053	0.000

Note: 1. As shown in Fig 5.2, the unstandardised parameter estimates of all paths were calculated after adjusting child anxiety symptoms, behavioral inhibition, parent/carers anxiety, multiple individual- and school-level demographic factors at baseline. Group assignment was coded as intervention group=1, usual school practice group=0.

2. b=unstandardised parameter estimate; se= standard error estimates; p value indicates significance if < 0.05.
3. Intention-to-treat analysis included all participants randomised to the intervention and usual school practice group.
4. Complete case analysis included participants with available data on the mediator under examination (at baseline and 12 weeks) and child anxiety symptoms (at 12 months).

Chapter 6: How an Online Therapist-Guided Parent-Delivered CBT Reduce Anxiety in Young Children: A Qualitative Study from Parents' Perspectives

Introduction

Although the quantitative study presented in Chapter 5 identified several mediators through which the GPD-CBT programme evaluated in the MY-CATS study could reduce anxiety symptoms in young children (4-7 years) identified at risk of anxiety disorders, its quantitative design was limited to examine pre-assumed mediators. As a result, it may have overlooked novel or unexpected changes perceived by parents that may contribute to child anxiety outcomes. A qualitative study can help address this limitation by exploring participants' experiences. It can also reveal *how* each change happened and contributed to child anxiety outcomes. This detailed information can provide valuable insights for theory development and the design and delivery of future interventions. This chapter reports on the analysis of 19 transcribed one-to-one interviews with parents who received the GPD-CBT programme in the MY-CAT study using an inductive reflexive thematic analysis approach, to explore parents' perspectives on the changes that occurred during the intervention which may have contributed to the reduction of their children's anxiety, with the aim to offer a deeper and more comprehensive understanding of the intervention's mechanisms.

Method

Procedure, participants, intervention

As for the qualitative study presented in Chapter four, this study was also a secondary analysis of qualitative interview data collected in the MY-CATS study. The procedures of the MY-CATS study and intervention it evaluated have been introduced in the previous chapter (see the sections of *Procedure* and *Intervention* in Chapter three). The recruitment and screening procedures for interview participants, the characteristics of those participants, the interview process, and the topic guide were identical to those described in the qualitative study presented in Chapter four (see the sections of *Procedures* and *Participants*). Some questions in the topic guide specifically focused on parents' perspectives on changes that happened during the intervention (e.g., "*What kind of change have you seen in your*

child/yourself/your family etc. since taking up the intervention?" "*When did these changes happen?*" "*How do you think these changes happened*?"). I anticipated that parents' responses to these particular questions would be most likely to be relevant to the research questions of this study, however, full transcriptions of all interviews were analysed to avoid missing valuable information.

Data analysis

Similar to the qualitative study presented in Chapter 4, this chapter also used an inductive reflexive thematic analysis approach for data analysis. The coding process followed the same procedures presented in Chapter 4 (see the section of *Data Analysis* in Chapter 4) but was applied to address different research questions. Specifically, in this chapter, codes generated from the transcripts were gradually organised into groups. Each group represented a change during the intervention that may contribute to reduction in child anxiety, including what the change was, how the change happened, and how the change contributed to the reduction of child anxiety, evidenced by direct quotes from the transcripts. Based on all changes identified and how one change might relate to another, I gradually developed the paths of changes through which the intervention could reduce children's anxiety.

All researchers who participated in the data analysis for Chapter 4 also took part in the analysis for this chapter and served in the same roles. They also reflected their potential biases in relation to the specific research questions of this Chapter. Specifically, as a doctoral student focusing on family and young children's mental health, I believe that parents play a critical role in children's psychological development, which may shape my expectations that the changes in parents could play an important role in the mechanism of the intervention. CC, TR, and GH, who involved in the design, delivery, and evaluation of the intervention, may introduce biases due to their pre-assumptions about the mechanisms of the intervention.

Results

As shown in Fig 6.1, parents described that some components of the intervention changed their responses to children's anxiety, including how to talk about fears and worries with their child, how to facilitate their child's fear testing, and how to normalise fears and model fear testing. These changes in parental responses appeared to contribute to the reduction in children's anxiety by promoting changes in children' ability and willingness to talk about

feelings and thoughts, cognitive biases, and coping strategies. Additionally, some parents reported that their overall experience with the intervention brought about some other changes that facilitated changes in their responses to child anxiety and thus contributed to improvements in child anxiety, including better identification of child anxiety, increased efficacy in dealing with child anxiety, and improved management of their own anxiety. Finally, a few parents expressed that the intervention helped them identify and manage family triggers for their child's anxiety and encouraged them to seek support from their child's school, which also contributed to a reduction in child anxiety. The following sections provide a detailed description about how each change occurred and contributed to reductions in child anxiety, evidenced by direct quotes from the transcripts.

[Insert Fig 6.1]

Changes in parental response to child anxiety

Talking about fears and worries with child

First of all, the intervention encouraged parents to talk about fears and worries with children in a way that validates children's emotions and emotional expression and encourages children to consider and express their thoughts and feelings using curious questions (Module 2). Some parents reported that these changes in conversations promoted their child's ability and willingness to talk about feelings and thoughts, allowing them to better understand their child's anxiety and provide appropriate help. For example, several parents described how the intervention encouraged them to validate their child's emotions and emotional expression and how that promoted the child's willingness to talk openly: *"just try and validate their emotions say "yeah, it's ok to be scared, it's ok to feel anxious, it's ok to be worried. Let's figure this out together". (P5). "We praised him a lot by saying 'if you told us why, we could go and deal with it.' .... Now he was quite comfortable and confident in telling us what was bothering him...." (P16).* A mother highlighted how the more she talked about fears and worries with her son, the better he became at expressing himself: *"when we started first talking about worries, he was like 'What do you mean a worry? What's a worry?' But then once I explained it to him, he quite got it and was like 'oh, actually I have quite a few of them'...He didn't really have the language obviously to maybe speak about worries, which is so normal at that young age, but it can be helpful to provide that language." (P6).* Another mother described how curious questions encouraged her daughter to talk more openly: *"...that was the frustrating thing because I was being quite open and trying to get [child] to meet me*

halfway.... But it's not that she didn't want to she just didn't know how to. So, it was only when I had those probing questions and knowing how to ask... once I had those tools to how to dig a little bit deeper..." (P9). Some parents noted how such increased openness enabled them to better understand their child's anxiety and provide help. As a mother said: *"it's more because she tells us what she's thinking and doesn't make everyone guess…. By talking about things and having that communication factor, it's meant that we can work away that she'll actually tell us rather than just waiting until it's too late." (P8).*

Parents also reported that the intervention taught them how to talk in an open and curious way about fears and worries with their child, which helped the child notice and change anxiety-provoking cognitive biases and reduced related anxiety (Module 2). For example, a mother described how changing the way she talked to her daughter altered her daughter's tendency to overestimate the likelihood of threats and associated worries: "*We delved into when she told me what she thinks might happen. She tells me how likely she thinks it's gonna to be. And nine times out of ten she realises that it's probably not very likely and she doesn't need to worry about it and then, she stops*." *(P1).* Another mother similarly felt that these changes in conversations reduced her son's tendency to overestimate the severity of threats, and thus reduced his anxiety: *"I think it is helpful letting him go through his thought processes…Like ask him 'what do you think it's gonna be at school.', and then ask him again at the end of the day… it's just that sort of feeling before you do something where everything's gonna be absolutely terrible and then realising at the end of the day maybe it wasn't quite as bad as you were worrying. That's something that maybe contribute to his anxiety reducing." (P18).* Some parents also noted that open and curious conversations about fears and worries helped their child develop positive cognitive-restructuring strategies, enabling them to identify and alter their anxiety-provoking thoughts independently: *"…because of the way that we talk about them, now I think she probably doesn't have to bring up so many because, I think she goes through that thought process on her own without my help." (P1).*

Another change in conversations brought about by the intervention, as mentioned by parents, was gently encouraging children to "have a go" at testing their fears in a manageable way. Some parents reported that such changes in conversations encouraged their child to put fears to the test, thereby reducing avoidant coping strategies and providing opportunities for new learning, which helped reduce anxiety. For example, a mother described how the intervention changed the way she talked about fears and worries with her son, from being overprotective

to encouraging him to test fears: "*I was maybe overprotecting him…I just say, 'don't worry' or 'anything will be fine' sometimes in fact it just doesn't help… It's just always better to say this 'let's see how we go then if you need help then I'm always there just to help you.'…they have to get their own experience in life…" (P15).* Similarly, a father described how the intervention changed the way he talked about fears and worries with his son, from pressuring the child to face fears to gently encouraging him to have a try: *"I'd be able to talk through the situation and go 'okay we don't have to do it. If you want to give it a try we're here to help you but, it's up to you' and he just feels a lot more at ease with himself as a result of going, 'Oh, I can just talk about this rather than get super upset and, and worried because the expectation is that I have to do something that I'm not really that keen on.'" (P3).*

Facilitating children's fear testing

The intervention taught parents how to facilitate their children's fear testing using graded exposure (Module 3) and problem-solving (Module 5). Some parents reported that the experiences of testing fears gave their children opportunities to re-evaluate anxiety-provoking cognitive biases and reduced related anxiety. For example, a mother said that the experiences of testing fears enabled her daughter to: "*think bit in a positive sense that 'everything is not as worse as she expected'" (P7).* Another mother felt that the experience of testing fears altered her son's tendency to underestimate his coping abilities and promoted his confidence: *"The step plan was the biggest strategy that worked for us. Each time he did that so between each step I think he gained confidence. I think the thing is there was just him realising that he can be on his own and it's gonna be fine" (P14).*

Furthermore, many parents reported that the experience of testing fears helped reduce their children's avoidant coping strategies, with children "*wanting to have a go at things." (P1)*. And as children became more open to trying new things, their confidence grew, and their anxiety decreased. As a mother said, her son "*wanted to do new things that he'd not done before. That helped his confidence. And because his confidence increased, his anxiety decreased at the same time." (P16).*

Parents also mentioned that the experience of testing fears gave their children opportunities to practise adaptive coping strategies introduced in the intervention, including making step plans (Module 3) and problem-solving (Module 5). Parents reported that these adaptive coping strategies enabled their children to deal with anxiety-provoking situations instead of being

overwhelmed by fears and worries. For example, one mother said that step plans broke a big goal to small ones, making it more digestible for her daughter: *"the step plan was really helpful. I think she's a little bit concerned about it at first when she was looking at the whole thing overall, when she was looking at the end goal. But I said to her to focus on the first step and then she was OK." (P1*). This mother also noted that step plans helped her daughter focus on specific tasks, reducing her anxiety related to unknown: "*I think once we'd got the step plan written down. She knew what was gonna happen. I think it works well with her need to know what's happening and what's going to happen instead of just being like a chaos." (P1).* Another mother mentioned that the problem-solving strategies enabled her child to solve problems instead of *"running off in a huff": "I'm trying to get him to, like 'can you think about something' or 'when you calm down have a think about, come up with solutions' and then, we can talk sort of thing so that's actually been useful." (P12*). Furthermore, some parents noted that, over time, these positive coping strategies became internalised for their children, enabling their children to manage challenging situations and related anxiety independently. For example, a mother said that her son could use the step plan approach independently: "*I know we learnt to do it like as a whole but I think he has done that for himself...he sets himself little goals and works up kind of thing." (P19).* Another mother said that her daughter could use the problem-solving strategy independently: *"now she uses her own brain to think of different solutions to do things now rather than relying on me." (P8).*

Normalising fears and modeling fear testing

Working through the intervention encouraged parents to normalise their children's experiences of fears and worries by sharing their own experiences of fears and worries with their children when appropriate (Module 3). Some parents reported that their own openness about fears could improve children's willingness to talk about feelings and fears, as a mother said: "*when I spoke to [child], me as an adult I also have some worries and I also had some worries as a child. It's really good for him when he sees that is not just particular about his worries but that is normal… he was more than living in his little world and now I think he is just getting more open to the whole world…." (P15).* Parents also found that by expressing their own fears, they could help their children reduce anxiety by altering unrealistic thoughts of being *"fearless and perfect*", making children realise that *"'it's normal to worry about something' and 'we all are worrying about something'" (P15).* As a mother said: *"I think it was important to show her that I'm scared of stuff too rather than trying to be this perfect, flawless person because then it gives her a lot to try and live up to." (P2).*

The intervention also encouraged parents to model fear testing (Module 3). Some parents noted that by demonstrating to children what actually happened in anxiety-provoking situations, they could help their children reduce anxiety by re-evaluating cognitive biases (e.g., threat overestimation) based on objective information, helping them realise that "*it's nothing to worry about*". For example, a mother tried to *"make sure that I model that sort of behaviour for him as well. So that he can see that people respond people don't respond…it's nothing to get worried about like 'oh why didn't they say hello back to me'" (P12).* Similarly, another mother tried to be *"positive and ok around the dogs, showing a good example, that showed that she could be ok or around the dogs." (P5).*

Other changes in parents contributing to altered responses to child anxiety

Better identification of child anxiety

Some parents shared that the overall experience with the intervention helped them better identify their child's anxiety symptoms, allowing them to respond effectively. For example, one mother said that the intervention helped her better recognise her son's anxiety cues, allowing her to respond more promptly: *"…looking at the cues about when he was worried about certain things or when he was not feeling confident to try new things, and just be more mindful about the cues and his body language and how he was feeling…." (P16).* Another mother shared that the intervention helped her understand her daughter's specific difficulties as anxiety-related, allowing her to respond differently: *"[child] always had an issue with water going over her head. I'd never particularly thought about that being anxiety. And she had a fear of heights as well. Again, that was maybe dismissed on my part of being what that actually was…" (P9).*

Increased self-efficacy in dealing with child anxiety

Some parents expressed that the overall experience with the intervention increased their sense of self-efficacy in dealing with child anxiety, which, in turn, enabled them to respond to child anxiety more effectively. For example, one mother described how the intervention made her feel confident in her responses to her child's anxiety and increased the consistency of her effective responses: *"Before I was always second doubting myself thinking is [child] just doing this because I'm going to give into him or is there actually a problem? … Now, I know I was doing the right thing, I got consistency." (P6).*

Improved management of parental anxiety

Some parents noted that some CBT strategies introduced in the intervention helped them manage their own anxiety, enabling them to then respond more effectively to their child's anxiety. As a mother said: "*The only concern I had was how I would handle a situation that he's anxious about that I'm also anxious about… It was just more myself and how I can control mine…Instead of me saying 'oh yeah I get it mate I'm the same I don't like it either', I said 'it's okay not to like them because you can't see their faces, I understand.' 'But actually, so far, what has happened for you to be so scared?' He goes 'well nothing' …Whereas I'm sitting there thinking 'okay nothing's ever happened to me…I need to believe it myself' … I think because of the way that understanding but making it into reassurance in a better way rather than 'it's okay get over it.' like running away from it myself." (P17).*

Other changes in parents contributing to the reduction of child anxiety

Management of family triggers of child anxiety

Some parents noted that the intervention helped them recognise triggers for their children's anxiety within their family context, such as a sibling's anxiety or other negative events in family life. As a result, they could take action to mitigate the negative impacts of these triggers. For example, one mother said: *"A big one of triggers was picking up my son's [the target child] anxiety from his sister [sibling], and he's definitely improved with that." (P19).* Another mother mentioned: *"[child's father] had moved out…which then was making her anxiety worse… we had to work together to try and figure out a way of making it work…It kind of gave us a way of working together to make sure that we had a common goal…." (P8).*

Increased contact with school

The intervention also encouraged parents to contact their child's school for support where applicable. Teachers, in turn, were able to help children navigate anxiety-provoking situations at school, thereby contributing to reductions in child anxiety. For example, a mother told one teacher about her son's anxiety in classes, and the teacher responded supportively: *"… one thing that was different was I did talk to his teacher this year and I told her "Even though his writing looks fine compared to other kids, he's quite anxious about it". And so, she actually made sure she gave him quite a lot of support to make him feel like "it was okay". … maybe I wouldn't have thought of doing that if I hadn't been through the study". (P18).* Another

mother told some teachers that her son was finishing an exposure task of "*working towards speaking to other teachers and stuff*". One teacher then took some actions to help: *"that teacher made a point of chatting to [child] a bit more, finding something that's interesting to him and they'd chat about it like the Maths, so that definitely helped." (P12).*

Discussion

This qualitative study describes parents' perspectives on how the GPD-CBT programme evaluated in the MY-CATS study reduced anxiety in young children (4-7 years) identified as at risk of anxiety disorders (See Fig 6.1). Study findings provided qualitative evidence for the mediators identified in the quantitative study presented in Chapter 5 and extend the quantitative findings by identifying more changes in parents and children during the intervention that may contribute to children's anxiety reductions and elucidating how these changes occurred and how they contributed to child anxiety outcomes.

Changes in children related to anxiety reduction

The quantitative study in Chapter 5 have found that the GPD-CBT programme evaluated in the MY-CATS study could reduce children's anxiety symptoms by targeting children's cognitive and behavioural processes (e.g., intolerance of uncertainty, behavioural avoidance, coping efficacy). Consistent with these findings, this qualitative study identified a broader range of changes in children's anxiety-provoking cognitions (e.g., overestimating the likelihood and severity of threatening situations, underestimating one's coping ability) and behavioural responses to anxiety-provoking situations (i.e., behavioural avoidance and the use of adaptive coping strategies) during the intervention which could contribute to children's anxiety reductions. These mechanisms of change align with cognitive-behavioural models of anxiety and therapeutic principles of cognitive behavioural therapy (Beck, 2005; Beck, & Clark, 1997; Beck et al., 1985). Prior evidence from therapist-led, child-focused CBT has similarly highlighted the mediating role of cognitive biases (e.g., threat interpretation bias, low coping efficacy), behavioural avoidance, and adaptive coping strategies in explaining treatment outcomes (e.g., Essau et al., 2011; Hogendoorn et al., 2014; Kendall et al., 2016). Extending this literature, this thesis provides both quantitative and qualitative evidence for these mechanisms in the context of GPD-CBT.

This qualitative study also found that the intervention could enhance children's ability and willingness to talk about their feelings and thoughts, which would help parents better understand the drivers of their children's anxiety and provide appropriate support in response. This novel mechanism of change identified from parents' experiences was not examined in Chapter 5 and has rarely been discussed in previous studies on mechanisms of change in CBT for child anxiety. It has been evident that the success of therapist-led CBT programmes relies on open communication between the client and therapist to identify thought patterns, set goals, and apply strategies (Keijsers et al., 2000; Thwaites & Bennett, 2007). As such, when parents take on these tasks with their child in GPD-CBT programmes, it is not surprising that fostering open conversations between parents and children is particularly important. The qualitative study presented in Chapter 4 has identified children's limited ability and willingness to talk about their fears and worries as a potential challenge for parents to implement the intervention. However, qualitative evidence from both Chapter 4 and this chapter indicated that certain strategies provided in the GPD-CBT programme evaluated in the MY-CATS study, including validating children's emotions and emotional expression; encouraging children to consider and express their thoughts and feelings using curious questions; normalising fears by sharing their own experiences of fears and worries with their children when appropriate, could help enhance children's ability and willingness to talk about their feelings and thoughts. Future GPD-CBT programmes might benefit from sharing these experiences with parents, particularly those with young children who may initially struggle to express themselves.

Changes in parental responses to child anxiety

This study also found that any positive changes in children related to anxiety reductions mentioned above stemmed from changes initiated by their parents. This highlights the importance of parental changes in the mechanisms of GPD-CBT for child anxiety, which represents a key difference from the mechanisms of therapist-led child-focused where therapeutic improvement is typically attributed to changes in children. Consistent with that, the quantitative study presented in Chapter 5 also found that the GPD-CBT programme evaluated in the MY-CATS study could reduce child anxiety through reducing parental overprotection, but it remained unclear how this change occurred and how it contributed to children's anxiety reductions. The findings from this qualitative study offer some possible explanations. Specifically, this study identified a broader range of adaptive changes in parental responses to child anxiety during the intervention (i.e., how to talk about fears and

worries with a child, how to facilitate a child's fear testing, and how to normalise fears and model fear testing). These new, adaptive responses, arising from specific intervention strategies provided in Module 2, 3, and 5 (See Table 3.2 for specific module content), may replace parents' old, maladaptive responses (e.g., overprotection) and were associated with one or more of children's positive changes related to anxiety reduction (i.e., altered cognitive biases, reduced behavioural avoidance, increased use of adaptive coping strategies, enhanced ability and willingness to talk about fears and worries).These paths of change linking specific intervention components, changes in parental responses to child anxiety, and children's changes related to anxiety reduction, represent the core mechanisms of GPD-CBT for child anxiety, which warrant further validation in future quantitative studies with larger and more diverse samples.

This study also identified several other positive changes in parents during the intervention that may contribute to their altered responses to child anxiety, including enhanced ability to identify children's anxiety, improved self-efficacy in managing children's anxiety, and better management of their own anxiety. Notably, enhanced ability to identify children's anxiety is a novel change in parents identified from parents' experiences which has not been mentioned in previous chapters. Although parents did not describe in detail how this change occurred, it is possible that the psychoeducation component of the intervention, where parents learned about what anxiety is and how it can develop and what keeps anxiety going, enabled parents to recognise early signs of anxiety in their children. In light of this, future GPD-CBT programmes should also include this component to promote parents' timely recognition of and response to their children's anxiety.

Parental self-efficacy in managing children's anxiety has been considered in the quantitative study presented in Chapter 5. Specifically, Chapter 5 examined whether the intervention reduced child anxiety symptoms by promoting parental self-efficacy but found no supporting evidence. One possible explanation proposed in Chapter 5 was that the MY-CATS study measured parents' general sense of competence in the parenting role rather than their specific self-efficacy in managing child anxiety (see the *Discussion* section in Chapter 5). Findings of this qualitative study supported this explanation, indicating that the intervention did, in fact, improve parental self-efficacy in managing children's anxiety, thereby enabling parents to respond more effectively to children's anxiety. Although the intervention did not specifically target parental self-efficacy, and parents did not specify which components or processes

contributed to their increased self-efficacy, as hypothesised in Chapter 5, all the skills and strategies provided in the intervention may help improve parental self-efficacy in managing children's anxiety. Children's improvement during the intervention may also reinforce parents' efficacy in their adaptive responses. In light of this, future GPD-CBT programmes should pay particular attention to fostering parents' confidence in manging child anxiety alongside intervention delivery to maximise the intervention effects.

In terms of parental anxiety, the qualitative study presented in Chapter 4 identified it as a potential barrier for parents to implementing GPD-CBT for child anxiety effectively. However, qualitative evidence from both Chapter 4 and this chapter indicated that certain intervention elements helped parents with elevated anxiety implement the intervention effectively. For example, strategies such as setting SMART goals helped some parents to implement the intervention effectively despite their own anxiety. Certain CBT strategies originally designed for children were used by some parents to manage their own anxiety, thereby facilitating their effective responses to children's anxiety. These findings suggest that parents with elevated anxiety can implement GPD-CBT for child anxiety effectively without additional modules or extra support. Future GPD-CBT programmes for child anxiety could share these experiences with parents who are concerned that their own anxiety might impede intervention implementation, thereby alleviating their concerns and supporting their effective engagement with the intervention.

Other changes in parents contributing to the reduction in child anxiety

This study also found that the GPD-CBT programme evaluated in the MY-CATS study could help parents identify and address triggers for their child's anxiety within the family context, thereby contributing to reductions in child anxiety. Previous research has indicated that various family environment factors, such as sibling relationships, marital relationships, conflict, and cohesion, can contribute to the development and maintenance of children's anxiety disorders (Drake & Ginsburg et al., 2012). Although the intervention did not include a component explicitly targeting family triggers of child anxiety, and parents did not specify which intervention components prompted them to pay attention to such triggers, getting involved in the intervention may nonetheless encourage parents to take a more active role in helping children cope with anxiety-provoking situations, including identifying and addressing risk factors in family environment that may exacerbate child anxiety. In light of this, future

GPD-CBT programmes can leverage the unique role parents can have in creating a supportive family environment that can help alleviate or prevent childhood anxiety disorders.

Finally, some parents reported that the intervention increased their contact with school staff who could help children manage anxiety-provoking situations at school, especially academic or social challenges that may not occur at home (Allen & Lerman, 2018; Manley et al., 2023). Although the intervention did not include content specifically designed for school staff nor require their involvement, parents were encouraged to seek support from their child's school when needed and feasible. Findings of this study highlighted the value of this approach, indicating that promoting collaboration between parents and teachers in a GPD-CBT programme can help children receive consistent support across both family and school settings. Future GPD-CBT programmes could build on this mechanism to enhance their effectiveness by not only encouraging parents to actively seek support from teachers, but also providing accompanying resources and support for school staff and exploring ways to make it easier for schools to provide effective support.

Strengths and limitations

Using an inductive reflexive thematic analysis approach, the qualitative study presented in this chapter explored parents' experiences with the GPD-CBT programme evaluated in the MY-CATS study in depth and identified a broad range of changes in children and parents during the intervention that may contribute to the reduction in child anxiety, some of which were not captured in the quantitative study presented in Chapter 5. Findings of this study also provided insights into how those changes occurred and how they contributed to child anxiety reductions. These insights help interpret the quantitative results reported in Chapter 5 and provide guidance for optimising the design and delivery of future GPD-CBT programmes for child anxiety to maximise their effectiveness. Despite these strengths, this qualitative study showed similar limitations as the qualitative study presented in Chapter 4, including limited demographic diversity within the sample, the absence of information on children's neurodiversity, an exclusive focus on parents' perspectives, and a lack of data to explore long-term mechanisms of change (see the *Strengths and limitations* section in Chapter 4). Future qualitative research on the same topic should include parents from more diverse demographic backgrounds, recruit parents of neurodivergent children, incorporate multiple perspectives (e.g., children and therapists), and investigate longer-term mechanisms of

change by following up with families over an extended period after their participation in the intervention.

Conclusion

Despite limitations, this study investigated the mechanisms through which an online GPD-CBT programme may reduce anxiety in young children (aged 4-7 years) identified at risk of anxiety disorders. Study findings highlighted several key components of the intervention that could change parents' responses to children's anxiety, including how to talk about fears and worries with their child, how to facilitate their child's fear testing, and how to normalise fears and model fear testing. These changes in parental responses appeared to contribute to the reduction in children's anxiety by promoting changes in children' ability and willingness to talk about feelings and thoughts, cognitive biases, and coping strategies. Study findings also suggested that parents' overall experiences with the intervention could led to some other changes that facilitated their adaptive changes in responses to child anxiety, including better identification of child anxiety, increased efficacy in dealing with child anxiety, and improved management of their own anxiety. The intervention could also help parents identify and manage family triggers for their child's anxiety and encourage them to seek support from their child's school, which also contributed to reduction in children's anxiety. Overall, these findings provide valuable insights for optimising the design and delivery of future GPD-CBT programmes for child anxiety, particularly those delivered online, remoted and/or targeting "at-risk" young children, to maximise effectiveness.

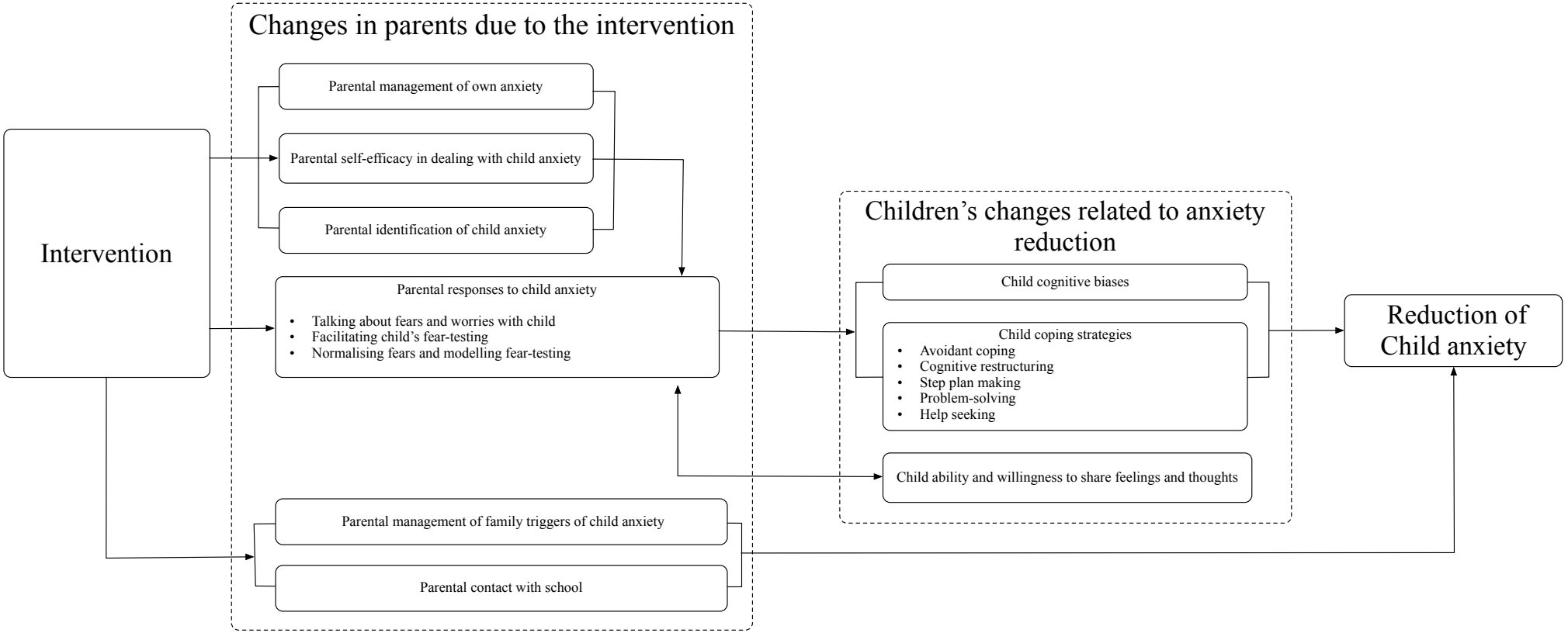

Fig 6.1. Parent perspectives on the mechanisms through which the OSI intervention reduces anxiety in young children

Chapter 7: Discussion

Increasing evidence has supported the effectiveness of GPD-CBT for the prevention and treatment of childhood anxiety disorders, however, little is known about factors that may influence its outcomes and mechanisms through which it works. This thesis aimed to improve understanding of these two questions using a multi-method approach.

Chapter 2 presented a meta-analytic review examining several pre-hypothesised moderators of CBT for the prevention and treatment of anxiety disorders in children and adolescents, with the aim to inform potential moderators relevant to GPD-CBT for child anxiety. However, only 8 of the 86 trials included in the review focused on GDP-CBT, limiting the applicability of review findings to this specific approach and the feasibility to examine moderators within trials of this specific approach. This highlighted the need for more high-quality trials to evaluate the effectiveness of GPD-CBT for child anxiety and to investigate factors that may influence its outcomes. **Chapter 3** and **Chapter 4** aimed to address this gap using data from a cluster randomised controlled trial (RCT) (i.e., *Minimising Young Children's Anxiety through Schools, MY-CATS*) in England, which evaluated the effectiveness of an online GPD-CBT programme for young children (4-7 years) identified as at risk of anxiety disorders based on at least one of three risk factors (child elevated anxiety symptoms, behavioural inhibition, parent elevated anxiety). **Chapter 3** quantitatively examined a range of potential moderators of the child anxiety outcomes of the intervention. **Chapter 4** explored parents' perspectives on potential moderators through qualitative interviews. **Chapter 5** and **Chapter 6** investigated the underlying mechanisms of the GPD-CBT programme evaluated in the MY-CATS study. The quantitative study in **Chapter 5** examined several hypothesised mediators through which the intervention may exert its effects on child anxiety. The qualitative study in **Chapter 6** explored parents' perspectives on how the intervention may reduce child anxiety. In this final chapter, I bring together the key findings across chapters and discuss the overall strengths, limitations, and implications of this thesis from a broader perspective.

What factors may influence the effectiveness of GPD-CBT for child anxiety?

Chapter 3 examined the moderating role of a range of child and parent characteristics on child anxiety outcomes in the GPD-CBT programme evaluated in the MY-CATS study, with the aim to identify who benefited more or less from the intervention. The results, however,

indicated that the intervention showed positive effects in most subgroups. Specifically, the intervention showed greater effects in reducing child anxiety symptoms among children with elevated initial anxiety levels than those without, which, according to Chapter 4, may be due to more room for improvement, more opportunities to practise intervention strategies, and stronger motivation to make changes; however the intervention still showed significant effects in reducing child anxiety symptoms compared to usual school practice in children with lower initial anxiety levels (e.g., children identified as at risk of anxiety disorders due to parental anxiety only). Similarly, although there was some evidence for the moderating effects of child age and parental motivation for engagement, with greater intervention effects in reducing child anxiety symptoms observed in older children aged 6-7 years and children of more highly-motivated parents compared to younger children aged 4-5 years and children of less motivated parents, it appears that these moderating effects may reflect the confounding effect of initial anxiety levels, as older children aged 6-7 years and children of higher motivated parents showed higher initial anxiety levels. A closer examination of the data showed that the intervention had significant effects in reducing child anxiety symptoms in all age groups across 4-7 years and for children of both more highly- and less-motivated parents. In fact, intervention effects for preventing anxiety disorders were significantly greater in younger children (4-5 years) compared to older children (6-7 years).

No other potential moderators examined in Chapter 3, including child gender, child and parent/carer ethnicity, parent/carer relationship to the child, cohabitation status, education level, employment status, and family socioeconomic background, and parent baseline anxiety levels), were found to be associated with intervention outcomes, with positive intervention effects observed across most subgroups. Although some of these non-significant moderating effects should be interpreted with caution given the small sample size in certain subgroups (e.g., families with a father as the primary participating carer, non-White British children, children at risk due to behavioural inhibition alone or all three risk factors), it is possible that certain elements of the intervention may have addressed challenges that may have otherwise been faced by different families, thereby facilitating the success of the intervention across diverse populations. Supporting this, parents in Chapter 4 also reported several child and parent characteristics that could pose challenges for intervention implementation, including a child's limited ability or willingness to talk about feelings and thoughts, limited motivation for intervention activities, parental anxiety, limited familiarity with tech, and limited time and capacity. However, parents also noted that challenges related to these factors were often

addressed by elements of the intervention (e.g., certain intervention content, therapist support, a user-friendly online system, flexible time scheduling), thereby enhancing the intervention effectiveness across diverse populations.

Finally, in addition to child and parent characteristics, parents in Chapter 4 also reported several process-related factors that enabled more effective implementation of the intervention, including implementing the intervention flexibly according to the child's needs, having clear goals, being persistent, and involving other parents/carers and the child's school. These findings suggest that beyond examining which sample characteristics may influence GPD-CBT outcomes for child anxiety, it is also important to understand *how* parents should be supported to implement the intervention in order to achieve optimal outcomes.

What are the mechanisms of changes in GPD-CBT for child anxiety?

In keeping with cognitive-behavioural theory (Beck et al., 1985; Beck, & Clark, 1997), evidence from both Chapter 5 and Chapter 6 suggest that the GPD-CBT programme evaluated in the MY-CATS study reduces children's anxiety by targeting children's anxiety-provoking cognitive biases and addressing their behavioural responses in anxiety-provoking situations. Specifically, Chapter 5 found that the interventions' effect in reducing children's anxiety was mediated by decreased intolerance of uncertainty related to children's negative thoughts in uncertain situations, increased coping efficacy reflected in children's confidence in their coping ability in challenging situations, and reduced behavioural avoidance characterised by a decreased tendency to avoid or escape anxiety-provoking situations. Parents in Chapter 6 also described their children's anxiety reductions as being linked to changes in anxiety-provoking cognitive biases (e.g., overestimating threats, low coping efficacy), reduced behavioural avoidance, and increased use of adaptive coping strategies (e.g., cognitive restructuring, step planning, problem-solving). In addition to these cognitive and behavioural changes in children, parents in Chapter 6 also highlighted children's enhanced ability and willingness to talk about their feelings and thoughts during the intervention as an important contributor to the intervention's success, as it enabled parents to better understand the drivers of their children's anxiety and provide more appropriate support, thereby facilitating children's cognitive and behavioural changes that directly contributed to anxiety reductions.

Evidence from Chapter 5 and Chapter 6 also highlighted the importance of parental changes as mechanisms of GPD-CBT for child anxiety, which represents a key difference from the mechanisms of therapist-led child-focused CBT where therapeutic improvement is typically attributed to changes in children. Specifically, Chapter 5 found that the intervention may reduce child anxiety through the mediating role of parental overprotection. Chapter 6 identified a broader range of changes in parents during the intervention that could contribute to children's anxiety reductions, including adaptive changes in responses to children's anxiety, enhanced ability to identify children's anxiety, improved self-efficacy in managing children's anxiety, better management of their own anxiety, management of family triggers of children's anxiety, and increased contact with school. Adaptive changes in parental responses to children's anxiety included how to talk about fears and worries with the child, how to facilitate the child's fear testing, how to normalise fears and model fear testing. These adaptive changes arising from specific strategies introduced in the intervention could result in one or more positive changes in children which facilitate anxiety reductions as mentioned above. Other changes in parents, although not direct targets of the intervention, emerged as by-product effects during the intervention and may have further facilitated positive changes in children by enabling parents to respond more effectively to child anxiety and fostering supportive family and school environments.

Broader strengths and limitations

Specific strengths and limitations of each study in this thesis have been outlined in the *Discussion* sections of Chapter 2 to Chapter 6. However, there are some broader strengths and limitations across studies that warrant attention.

Multi-method approach

A key strength of this thesis lies in its multi-method approach which enabled a deeper and more comprehensive understanding of the research questions. Specifically, the quantitative studies (Chapters 3 and 5) examined a range of potential moderators and mediators of the intervention in a larger sample. While the qualitative interview studies (Chapters 4 and 6) delved into parental experiences using inductive thematic analysis, which provided evidence-based interpretations of certain quantitative results, identified novel factors that may moderate intervention outcomes, and revealed nuanced mechanistic pathways through which the intervention may reduce child anxiety. For example, Chapter 3 found that the intervention showed greater effects among children with elevated initial anxiety levels than those without;

Chapter 4 then identified a similar pattern and further indicated that this may be due to more room for improvement, more opportunities to practise intervention strategies, and stronger motivation to make changes. Similarly, Chapter 5 demonstrated that the intervention effects in reducing child anxiety were mediated by several cognitive and behavioural changes in children (i.e., intolerance of uncertainty, behavioural avoidance, coping efficacy). Chapter 6 identified a broader range of cognitive and behavioural changes in children (i.e., various kinds of cognitive biases, behavioural avoidance, positive coping strategies) that may contribute to anxiety reduction and further linked these changes to adaptive changes in parental responses to child anxiety and specific intervention components, thereby offering a broader understanding of how these changes may unfold.

It is important to also note that the multi-method approach used in this thesis also had some limitations. Specifically, although the results of the qualitative studies (Chapter 4 and 6) substantially extended the results of the quantitative studies (Chapter 3 and 5), the parallel collection of quantitative and qualitative data meant that I was unable to develop or adjust the topic guides for parent interviews based on the quantitative results. As a result, not every quantitative finding could be directly corroborated by parents' experiences or perspectives in the qualitative studies. For example, several potential moderators examined in the quantitative studies (e.g., ethnicity, family socioeconomic background) were not mentioned by parents in the qualitative interviews. For the same reason, I was unable to use qualitative results to determine which potential moderators and mediators should be examined in the quantitative studies. As a result, many of the moderators and mediators identified from parents' experiences in the qualitative studies need to be examined in future quantitative studies.

Focusing on a specific GPD-CBT programme

All empirical studies (Chapter 3-6) included in this thesis focused on a specific GPD-CBT programme evaluated in a specific RCT study (i.e., MY-CATS study). Although their findings expanded current understanding of moderators and mediators of GPD-CBT for child anxiety, the particular sample and intervention characteristics of the targeted GPD-CBT programme may have limited the generalisability of the findings of this thesis to other GPD-CBT programmes for child anxiety.

Some sample characteristics of the targeted GPD-CBT programme may limit the generalisability of the findings of this thesis. For example, the MY-CATS programme focused on young children aged 4-7 years; therefore, caution is warranted when applying these findings to programmes for older children. Specifically, the quantitative study in Chapter 3 provided some evidence for the moderating role of child age on GPD-CBT outcomes within the 4-7 age range. However, it remains unclear how the effectiveness of GPD-CBT might vary across broader age groups (e.g., 4-7 vs. 7-12 years). Similarly, children's limited ability to talk about feelings and thoughts were identified both as a potential moderator and mediator of the targeted GPD-CBT programme in this thesis, which may reflect age-related limitations in young children's language development that may not be applicable to many older children. Furthermore, the MY-CATS programme adopted a targeted preventive approach, focusing on children identified at risk of anxiety disorders based on at least one of three risk factors: child elevated anxiety symptoms, behavioural inhibition, parental elevated anxiety. Therefore, it remains unclear to what extent the findings of this thesis are applicable to GPD-CBT treatments targeting children with current, clinically diagnosed anxiety disorders. In addition, using all three factors simultaneously to identify "at-risk" children may have increased the interrelations among child baseline anxiety, child baseline behavioural inhibition, and parental baseline anxiety. For example, children without behavioural inhibition at baseline necessarily had elevated anxiety and/or parents with elevated anxiety. This overlap could create potential confounding effects, making it difficult to disentangle the independent moderating effects of each of these baseline variables on intervention outcomes (see *Discussion* in Chapter 3). Moreover, the MY-CATS programme was conducted with samples recruited from infant/primary schools in England; therefore, caution is also needed when generalising the findings of this thesis to GPD-CBT programmes conducted in other cultural or regional contexts. Even within England, although the MY-CATS sample showed reasonable representativeness for some demographic characteristics (e.g., the proportion of White and non-White participants; see the *Participants* section in Chapter 3), representativeness was less adequate for certain other demographic variables. For example, more than half of the parents/carers in this study held an undergraduate degree or higher, a proportion exceeding the national average of 33.8%. These limitations in sample representativeness may restrict the generalisability of the findings to certain population groups within England. Finally, to maximise accessibility, the MY-CATS programme also included children with neurodiversity (e.g., autism, ADHD). However, without information regarding children's neurodiversity, I was unable to examine its potential impact on

intervention outcomes. It also remains unclear to what extent the thesis findings regarding moderators and mediators of intervention effects can be generalised to neurodivergent children.

Intervention characteristics of the targeted GPD-CBT programme, such as its format and content, may also limit the generalisability of the findings of this thesis. For example, Chapter 4 identified parental familiarity with digital technology as a potential moderator, which clearly only applies to GDP-CBT programmes delivered in an online format. Chapter 4 also indicated that some factors that parents worried might affect intervention outcomes (e.g., a child's limited ability or willingness to talk about feelings and thoughts, limited motivation for intervention activities, parental anxiety, limited familiarity with tech, and limited time and capacity) could be effectively addressed by certain elements of the intervention. This suggests that the extent to which a factor moderates intervention outcomes may vary across studies, depending on how effectively the intervention addresses the challenges associated with that factor. In addition, when examining whether the intervention effects are mediated by a certain factor, intervention characteristics such as intervention content, the form and timing of content delivery, therapist involvement, assessment time points, and adherence may all influence the results. One example is the inconsistent findings regarding changes in parental overprotection during the GPD-CBT programme evaluated in Morgen et al. (2018) and the MY-CATS study, as discussed in Chapter 5 (see the *Discussion* section). Finally, the effectiveness of the targeted GPD-CBT programme was evaluated using two types of child anxiety outcomes: (1) the presence of an anxiety disorder in the intervention group compared to usual school practice group at 12 months post randomisation, as assessed by independent evaluators via the Anxiety Disorder Schedule-Child Version-Parent Interview (ADIS-P, Silverman et al., 1996); and (2) the reduction of anxiety symptoms in the intervention group compared to usual school practice at 12 weeks and 12 months post randomisation, as reported by parents/carers via the Preschool Anxiety Scale (PAS, Spence et al., 2001). The strengths and limitations of using these outcomes for evaluating intervention effects and conducting moderation and mediation analyses have been discussed in detail in Chapters 3 and 5. Beyond that, caution is also needed when generalising the quantitative results of moderation and mediation analyses in this thesis to other GPD-CBT programmes for child anxiety which assess effectiveness using different measurement tools, alternative informants (e.g., child-reported anxiety symptoms), assessment points, pre-post designs, or other types of control groups (e.g., waitlist controls).

Implications

Research implications

How the specific findings and limitations of each study inform future research has been discussed in their respective *Discussion* and/or *Strengths and limitations* sections (Chapters 2–6). This section focuses on the broader research implications of the thesis, drawing on the overarching strengths and limitations highlighted in the previous section.

Firstly, the limited generalisability of the empirical findings of this thesis to other GPD-CBT programmes indicates a clear need for more studies to evaluate the effectiveness of GPD-CBT for child anxiety, the factors that influence its outcomes, and the mechanisms through which it works. By accumulating evidence from various GPD-CBT programmes for child anxiety that differ in content, delivery format, target populations, assessment approaches, we can gradually develop a more comprehensive understanding of the moderators and mechanisms of this approach.

It is also recommended that future research exploring the moderators and mechanisms of GPD-CBT for child anxiety, and other psychological interventions for children's mental health, adopts both quantitative and qualitative approaches to achieve a deeper and more comprehensive understanding of the research questions and to lever the complementary strengths of these two approaches. For example, quantitative studies can go beyond examining theoretically hypothesised moderators and mediators to also measure and test novel moderators and mechanistic pathways identified from parents' experiences in qualitative research. Similarly, qualitative interview studies could build on parents' experiences to further probe and contextualise quantitative findings, helping to explain why certain factors do or do not moderate or mediate intervention outcomes.

Clinical and practical implications

Taken together, the findings of this thesis can inform the design and delivery of future GPD-CBT for child anxiety based on a better understanding of who can benefit from this approach, key targets and components of this approach, and how to support parents to overcome challenges and implement this approach effectively.

Who can benefit from GPD-CBT?

Overall, this thesis suggests that GPD-CBT is a promising targeted preventive approach broadly applicable for young children (aged 4-7 years) identified as at risk of anxiety disorders on the basis of one or more risk factors (i.e., elevated child anxiety symptoms, behavioural inhibition, and parental elevated anxiety) across a wide range of child and parent characteristics, including child age and gender, child risk profiles, child and parent baseline anxiety levels, child and parent ethnicity, parental motivation for engagement, parental relationship to the child, parental cohabitation status, parental education level, parental employment status, and family socioeconomic background. Although the intervention appeared to show smaller effects in reducing child anxiety symptoms in subgroups of children with lower initial anxiety symptoms (which overlapped with children identified as at risk of anxiety disorders due to parental anxiety only, younger children aged 4-5 years, and children of less-motivated parents), the intervention still demonstrated positive effects in those subgroups, suggesting that GPD-CBT is still applicable for these populations. This may be especially the case for younger children (4-5 years) where the intervention had a significant greater effect in preventing anxiety disorders at 12 months compared to the effect among older children (6-7 years), indicating that GPD-CBT may be particularly promising for preventing anxiety disorders in younger children.

Key targets and components of the intervention

This thesis suggests that GPD-CBT could reduce children's anxiety by helping enhance children's abilities and willingness to talk about feeling and thoughts, adjust anxiety-provoking cognitive biases (e.g., intolerance of uncertainty, low coping efficacy, threat interpretation bias), reduce behavioural avoidance, and learn and practise positive coping strategies (e.g., cognitive restructuring, step planning, problem-solving). These changes in children should also be highlighted as key targets in future GPD-CBT programmes for child anxiety.

The thesis also suggests that these key changes in children mainly result from parents' adaptive changes in their responses to child anxiety, which are facilitated by several core components of the targeted GPD-CBT programme (Module 2, 3, and 5; see details in Table 3.2). These include (1) talking about fears and worries with the child in a constructive way to help the child feel understood, recognise anxious thoughts and identify more realistic

alternatives, and encourage curiosity to test these thoughts in real-world situations (Module 2); (2) facilitating children's fear testing using step plans and problem-solving strategies (Module 3 and 5); (3) normalising fears and modeling fear testing (Module 2). These new, adaptive responses may gradually replace pre-existing, potentially maladaptive responses (e.g., overprotection), thereby fostering positive changes in children. Future GPD-CBT programmes for child anxiety should also incorporate these components and maximise their impact to optimise intervention outcomes.

Supporting parents to overcome challenges and implement GPD-CBT effectively

The findings of this thesis suggests that parents may encounter some challenges when implementing a GPD-CBT programme for child anxiety, such as children's limited ability and willingness to express their feelings and thoughts, children's limited motivation for intervention activities, parents' own anxiety, parents' limited time and capacity, and parents' limited familiarity with digital technology (if the programme was delivered through a digital device). However, the findings also suggests that these challenges can be addressed through appropriate intervention design and implementation. Specifically, certain strategies for parents to talk about fears and worries with their child (e.g., increasing parent-child communication about feelings and thoughts, providing emotion validation, and asking curious questions) could promote a child's ability and willingness to express feelings and thoughts. Parents could also implement intervention strategies in a way that can promote their child's motivation for intervention activities, such as integrating intervention exercises into dedicated parent-child time, conveying positive feedback from the therapist to the child, making use of rewards for facing fears, and encouraging the child's autonomy. Furthermore, by setting SMART goals and/or applying CBT techniques for themselves, anxious parents could better manage their own anxiety and/or implement the intervention effectively despite their own anxiety. In addition, flexible time scheduling and practical exercises that fit into daily routines could help parents overcome challenges related to limited time and capacity. For GPD-CBT programmes delivered online, a user-friendly digital system could facilitate parents' access to, and ease of use of, the intervention resources. Taken together, these experiences provide valuable insights for the design and delivery of future GPD-CBT programmes, highlighting ways to help parents overcome potential challenges and implement the intervention successfully.

Finally, this thesis also identifies some process-related factors and positive changes in parents during a GPD-CBT programme that can facilitate more effective intervention implementation. Future GPD-CBT programmes may consider supporting parents in these areas in order to enhance intervention outcomes:

- *Flexible implementation:* Parents in the GPD-CBT targeted in this thesis highlighted the importance of implementing the intervention flexibly according to their child's needs, including devoting more time to strategies and exercises that bring more benefit for their child and choosing whether to implement the intervention with the child's full awareness according to their child's responses. Given that, future GPD-CBT programmes should also give parents opportunities and support to implement the intervention flexibly according to their child's needs.
- *Setting clear goals*: This thesis also highlights the benefits of parents setting clear goals at the outset of the intervention to effectively implement the GPD-CBT. Therefore, future GPD-CBT should pay particular attention to assisting parents in establishing clear goals for the intervention and providing parents with specific tools to do so, such as the SMART goal setting and setting goals for step plans strategies provided in the GPD-CBT programme targeted in this thesis. It would also be helpful for GPD-CBT programmes to provide structured examples of effective goals and interactive exercises that guide parents in setting, reviewing, and refining their goals over time. In addition, therapists could use the initial support session to work with parents to establish more tailored and realistic goals and subsequently guide parents to review their progress against these goals and adjust them as needed throughout the intervention.
- *Supporting parental persistence*: This thesis highlights the importance of parental persistence for the success of GPD-CBT. It also suggests that structured therapist support, as provided in the GPD-CBT programme targeted in this thesis, plays a key role in helping parents maintain persistence, as therapists can monitor their progress through regular telephone or video calls, provide reassurance and encouragement during challenging times, and offer personalised guidance. Building on this, future GPD-CBT programmes are recommended to incorporate structured therapist support and to provide adequate training for therapists to effectively promote sustained parental engagement. It is also important to note that parents need to invest time and effort in consistently practising intervention strategies and exercises, as well as in attending regular therapist support sessions. Limited time and capacity may pose barriers for some families. However, as

discussed earlier, flexible scheduling of support sessions and practical exercises that can fit into daily parenting routines may help parents make better use of intervention resources while managing everyday demands, thereby sustaining their engagement with the programme.

- *Helping parents to better identify child anxiety:* The GPD-CBT targeted in this thesis helped some parents better identify their child's anxiety symptoms, which may be attributed to the psycho-education component that provides information on what anxiety is, how it can develop, and what maintains it. Given that better parental identification of child anxiety could facilitate their timely and adaptive responses, future GPD-CBT programmes should also include this psycho-education component about the signs, symptoms and origins of anxiety in their children. In addition, incorporating practical tools such as symptom checklists, illustrative case examples, and video demonstrations of how anxiety may present in children's everyday behaviours could further support parents in recognising signs of anxiety in children throughout the intervention and discussing these observations with therapists.
- *Improving parental self-efficacy in managing child anxiety:* The GPD-CBT targeted in this thesis improved some parents' self-efficacy in managing child anxiety, which may be attributed to the skills and strategies provided in the intervention and children's improvement during the intervention. Given that improved self-efficacy in managing child anxiety could facilitate parents' adaptive responses to child anxiety, future GPD-CBT should pay particular attention to fostering parents' confidence in managing child anxiety alongside intervention delivery to maximise the intervention effects. This may include guiding parents to notice and record their child's improvements, discussing how their own efforts contributed to these changes, and providing positive feedback to reinforce parents' sense of competence and sustain their motivation over time. In addition, when parents encounter difficulties in implementing the intervention, therapists should use regular support sessions to provide emotional support, help parents recognise that experiencing challenges is normal, and support them to explore potential solutions, thereby reducing self-doubt or self-blame.
- *Other available support*: This thesis also highlights the value of support from other parents/carers and the child's school in helping parents effectively implement GPD-CBT. Given that, future GPD-CBT programmes may benefit from helping parents consider who they might be able to draw on for support, helping parents build their networks where

support is lacking, and considering how to make it easier for 'the supporters' to provide useful support. For example, as in the online GPD-CBT programme evaluated in this thesis, future programmes can also offer "observer accounts" that allow other parent/carers or teachers to review intervention strategies, exercises, and a child's goals and progress. Therapists can also discuss with parents the possibility of involving other supporters and the potential benefits. For instance, involving other parent/carers may help ensure consistency across caregivers, reduce the time burden, and provide diverse perspectives, while teachers' involvement may enable children to receive consistent support across both home and school contexts. In addition, parents can be encouraged to initiate conversations with schoolteachers to seek support, such as facilitating the child's practice of intervention exercises in school settings. Setting up simple communication channels (e.g., weekly check-ins or shared progress notes) may help facilitate alignment between home and school. Accessible resources (e.g., information sheets) or brief workshops for teachers and school staff can further equip them to support participating children and families effectively. Furthermore, co-design efforts are also recommended to learn from the experiences and particular needs of parents who may now have ready access to support and to promote collaboration with potential supporters. Despite that, it should be noted that additional support from other family members or a child's school, while beneficial, is not a necessary condition for the success of the intervention. Future GPD-CBT programmes should be mindful of this, ensuring that parents (e.g., single parents) do not feel discouraged or doubt their ability to succeed due to the lack of other support.

- *Creating supportive environment:* Some parents in the GPD-CBT targeted in this thesis were encouraged to address factors within the family that could trigger child anxiety and to proactively contact school staff who can help children manage anxiety-provoking situations at school. Given that these changes can create a more supportive family and school environment that help alleviate child anxiety, future GPD-CBT programme may also consider leveraging these mechanisms to enhance intervention outcomes. That may include (1) introducing common family risk factors that may contribute to child anxiety (e.g., in psycho-education sessions), followed by structured discussions in therapist support sessions to help parents identify relevant factors in their own contexts and brainstorm possible solutions; (2) encouraging parents to initiate conversations with schoolteachers, not only to obtain support for the child's practice of intervention exercises in school settings, but also to gain a better understand of potential anxiety-provoking

situations at school and to develop collaborative strategies to help the child manage them; (3) providing accessible resources (e.g., information sheets) or brief workshops for teachers and school staff to support their role not only as "supporters" in helping parents implement the intervention, but also to enhance their understanding of common school-based risk factors that may contribute to child anxiety and practical strategies for helping children manage anxiety in classroom settings, thereby strengthening their active role in creating a supportive school environment.

Conclusions

CBT is the most extensively supported approach for the prevention and treatment of childhood anxiety disorders, but its traditional forms require intensive specialist resources (e.g., face-to-face contact with therapists in specialist settings), limiting accessibility for many children in need. Therapist-guided parent-delivered CBT (GPD-CBT) offers a promising way to improve access to effective interventions for children with, or at risk of, anxiety disorders. Although emerging evidence supports its effectiveness, the meta-analytic review in this thesis (Chapter 2) highlights that there is a lack of randomised controlled trials evaluating GPD-CBT, and even fewer studies have explored the factors that may influence its effectiveness and the mechanisms through which it works. Using quantitative and qualitative data from a randomised controlled trial of GPD-CBT, Chapter 3 to 6 of this thesis provides preliminary evidence addressing these questions. Findings suggest that GPD-CBT has broad applicability, at least for young children at risk of anxiety disorders, across a wide range of child and parent characteristics, and also identifies key targets, core components, and practical intervention designs and implementation strategies that should be emphasised in future programmes to maximise outcomes. These findings can inform the evidence-based optimisation of the design and delivery of GPD-CBT programmes for child anxiety and indicate promising directions for future research to investigate moderators and mechanisms in more diverse GPD-CBT programmes for child anxiety.

References

Aktar, E., Majdandžić, M, De Vente, W., & Bögels, S. M. (2013). The interplay between expressed parental anxiety and infant behavioural inhibition predicts infant avoidance in a social referencing paradigm. *Journal of Child Psychology and Psychiatry, 54*(2),144-156.

Aktar, E., Nikoli, M., & Bgels, S. M. (2017). Environmental transmission of generalized anxiety disorder from parents to children: worries, experiential avoidance, and intolerance of uncertainty. *Dialogues in Clinical Neuroence, 19*(2), 137-147.

Alfano, C. A., Beidel, D. C., & Turner, S. M. (2002). Cognition in childhood anxiety: conceptual, methodological, and developmental issues. *Clinical Psychology Review*, *22*(8), 1209–1238.

Ali, M. M., Teich, J., Lynch, S., & Mutter, R. (2018). Utilization of mental health services by preschool-aged children with private insurance coverage. *Administration and Policy in Mental Health and Mental Health Services Research, 45*(5), 731-740.

Allard, C., Thirlwall, K., Cooper, P., Brown, A., O'Brien, D., & Creswell, C. (2022). Parents' perspectives on guided parent-delivered cognitive behavioral therapy for childhood anxiety disorders: A qualitative study. *Journal of Emotional and Behavioral Disorders, 30*(3), 235-244.

Allen, J. L., & Lerman, R. (2018). Teacher responses to anxiety in children questionnaire (TRAC): Psychometric properties and relationship with teaching staff characteristics. *Emotional and Behavioural Difficulties*, *23*(2), 154-168.

American Psychiatric Association (2018). *Dictionary: Avoidance behaviour (definition).* Retrieved from: https://dictionary.apa.org/avoidance-behavior (accessed 29 August 2025).

American Psychiatric Association., & American Psychiatric Association. DSM-5 Task Force. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5.* (Fifth edition.). American Psychiatric Publishing.

Aminayi M, Roshan Chesli R, Shairi MR, Moharreri F. Comparative study of parenting styles and parenting self-efficacy in mothers of children withand without anxiety symptoms. *Journal of Fundamentals of Mental Health 2015 July-Aug; 17*(4): 186-91.

Ardelt, M., & Eccles, J. S. (2001). Effects of mothers' parental efficacy beliefs and promotive parenting strategies on inner-city youth. *Journal of Family, 22,* 944-972.

Baca, S. A., Goger, P., Glaser, D., Rozenman, M., Gonzalez, A., Dickerson, J. F., Lynch, F. L., Porta, G., Brent, D. A., & Weersing, V. R. (2023). Reduction in avoidance mediates effects of brief behavioral therapy for pediatric anxiety and depression. *Behaviour Research and Therapy*, *164*, Article 104290.

Baker, H. J., Lawrence, P. J., Karalus, J., Creswell, C., & Waite, P. (2021). The effectiveness of psychological therapies for anxiety disorders in adolescents: A meta-analysis. *Clinical Child and Family Psychology Review, 24*(4), 765-782.

Bandura, A. (1997). Self-efficacy: The Exercise of Control. New York7 W.H. Freeman and Company.

Barrett, P. M., Dadds, M. R. & Rapee, R. M. (1996). Family treatment of childhood anxiety. *Journal of Consulting and Clinical Psychology, 64* (2), 333-342.

Barrett, P., & Turner, C. (2001). Prevention of anxiety symptoms in primary school children: Preliminary results from a universal school-based trial. *British Journal of Clinical Psychology, 40*(4), 399–410.

Bayer, J. K., Beatson, R., Bretherton, L., Hiscock, H., Wake, M., Gilbertson, T., Mihalopoulos, C., Prendergast, L. A., & Rapee, R. M. (2018). Translational delivery of Cool Little Kids to prevent child internalising problems: Randomised controlled trial. *Australian and New Zealand Journal of Psychiatry, 52*(2), 181-191.

Beck, A. T. (2005). The current state of cognitive therapy—A 40-year retrospective. *Archives of General Psychiatry, 62*, 953-959.

Beck, A. T., & Clark, D. A. (1997). An information processing model of anxiety: Automatic and strategic processes. *Behaviour Research and Therapy, 35*(1), 49–58.

Beck, A. T., Emery, G., & Greenberg, R. L. (1985). *Anxiety disorders and phobias: a cognitive perspective.* New York: Basic Books.

Bennett, K., Manassis, K., Walter, S. D., Cheung, A., Wilansky-Traynor, Pamela, Diaz-Granados, Natalia, . . . Wood, J. J. (2013). Cognitive behavioural therapy age effects in child and adolescent anxiety: an individual patient data meta-analysis. *Depression and Anxiety, 30*(9), 829-841.

Bodden, D. H., Dirksen, C. D., & Bogels, S. M. (2008). Societal burden of clinically anxious youth referred for treatment: A cost-of-illness study. *Journal of Abnormal Child Psychology, 36*(4), 487-497.

Bomyea, J., Ramsawh, H., Ball, T. M., Taylor, C. T., Paulus, M. P., Lang, A. J., & Stein, M. B. (2015). Intolerance of uncertainty as a mediator of reductions in worry in a

cognitive behavioral treatment programme for generalized anxiety disorder. *Journal of Anxiety Disorders*, *33*, 90–94.

Borenstein, M., Hedges, L.V., Higgins, J.P., & Rothstein, H.R. (2011). *Introduction to meta-analysis*. Chichester: John Wiley & Sons.

Boswell, J. F., Thompson-Hollands, J., Farchione, T. J., & Barlow, D. H. (2013). Intolerance of Uncertainty: A Common Factor in the Treatment of Emotional Disorders: Intolerance of Uncertainty. *Journal of Clinical Psychology*, *69*(6), 630–645.

Braun, V. & Clarke, V. (2021). *Thematic Analysis: A Practical Guide*. Sage, London.

Brown, A., Creswell, C., Barker, C., Butler, S., Cooper, P., Hobbs, C., & Thirlwall, K. (2017). Guided parent-delivered cognitive behaviour therapy for children with anxiety disorders: Outcomes at 3- to 5-year follow-up. *British Journal of Clinical Psychology, 56*(2), 149-159.

Bryman, A. (2012). *Social research methods* (4th ed., pp. 310–319, 416-423). Oxford University Press.

Buss, K. A., Zhou, A. M., & Trainer, A. (2021). Bidirectional effects of toddler temperament and maternal overprotection on maternal and child anxiety symptoms across preschool. *Depression and Anxiety*, *38*(12), 1201-1210

Carleton, R. N. (2016). Into the unknown: A review and synthesis of contemporary models involving uncertainty. *Journal of Anxiety Disorders*, *39*, 30-43.

Carleton, R. N., Duranceau, S., Shulman, E. P., Zerff, M., Gonzales, J., & Mishra, S. (2016). Self-reported intolerance of uncertainty and behavioural decisions. *Journal of Behavior Therapy and Experimental Psychiatry*, *51*, 58-65.

Chansky, T. E., & Kendall, P. C. (1997). Social expectancies and self-perceptions in anxiety-disordered children. *Journal of Anxiety Disorders*, *11*(4), 347-363.

Chavira, D. A., Stein, M., Bailey, K., & Stein, M. (2004). Child anxiety in primary care: Prevalent but untreated. *Depression and Anxiety, 20*(4), 155-164.

Chen, H., Cohen, P., Crawford, T., Kasen, S., Guan, B., & Gorden, K. (2009). Impact of early adolescent psychiatric and personality disorder on long-term physical health: A 20-year longitudinal follow-up study. *Psychological Medicine, 39*(5), 865-874.

Chorpita, B. F., & Barlow, D. H. (1998). The development of anxiety: The role of control in the early environment. *Psychological Bulletin*, *124*(1), 3–21.

Christina, S., Magson, N. R., Kakar, V., & Rapee, R. M. (2021). The bidirectional relationships between peer victimization and internalizing problems in school-aged

children: An updated systematic review and meta-analysis. *Clinical Psychology Review, 85,* 101979.

Clarke, K., Cooper, P., & Creswell, C. (2013). The Parental overprotection scale: Associations with child and parental anxiety. *Journal of Affective Disorders, 151*(2), 618-624

Clauss, J.A., & Blackford, J.U. (2012). Behavioral inhibition and risk for developing social anxiety disorder: A meta-analytic study. Journal of the American *Academy of Child and Adolescent Psychiatry, 51*, 1066–1075.e1.

Cobham, V. E. (2012). Do anxiety-disordered children need to come into the clinic for efficacious treatment? *Journal of Consulting and Clinical Psychology, 80*, 465–476.

Cobham, V. E., Dadds, M. R., Spence, S. H., & McDermott, B. (2010). Parental anxiety in the treatment of childhood anxiety: A different story three years later. *Journal of Clinical Child and Adolescent Psychology*, *39*(3), 410–420.

Compton, S. N., Peris, T. S., Almirall, D., Birmaher, B., Sherrill, J., Kendall, P. C., … Albano, A. M. (2014). Predictors and moderators of treatment response in childhood anxiety disorders: Results from the CAMS trial. *Journal of Consulting and Clinical Psychology, 82* (2), 212-224.

Convertino, A. D., & Blashill, A. J. (2022). Psychiatric comorbidity of eating disorders in children between the ages of 9 and 10. *Journal of Child Psychology and Psychiatry, 63*(5), 519-526.

Cooper, P. J., Gallop, C., Willetts, L., & Creswell, C. (2008). Treatment Response in Child Anxiety is Differentially Related to the Form of Maternal Anxiety Disorder. *Behavioural and Cognitive Psychotherapy, 36*(1), 41-48.

Copeland, W. E., Angold, A., Shanahan, L., & Costello, E. J. (2014). Longitudinal patterns of anxiety from childhood to adulthood: The Great Smoky Mountains Study. *Journal of the American Academy of Child and Adolescent Psychiatry, 53*(1), 21-33.

Counsell, A., Furtado, M., Iorio, C., Anand, L., Canzonieri, A., Fine, A., Fotinos, K., Epstein, I., & Katzman, M. A. (2017). Intolerance of uncertainty, social anxiety, and generalized anxiety: Differences by diagnosis and aymptoms. *Psychiatry Research*, *252*, 63-69.

Crane, M. E., & Kendall, P. C. (2020). Psychometric evaluation of the child and parent versions of the Coping Questionnaire. *Child Psychiatry and Human Development*, *51*(5), 709-720.

Crawford, A. M., & Manassis, K. (2001). Familial predictors of treatment outcome in childhood anxiety disorders. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*(10), 1182-1189.

Creswell, C., & O'Connor, T. G. (2011). Interpretation bias and anxiety in childhood: Stability, specificity and longitudinal associations. *Behavioural and Cognitive Psychotherapy, 39*(2), 191-204.

Creswell, C., & Waite, P. (2015). The dynamic influence of genes and environment in the intergenerational transmission of anxiety. *American Journal of Psychiatry, 172*(7), 597-598.

Creswell, C., Chessell, C., & Halliday, G. (2023). Parent-led cognitive behaviour therapy for child anxiety problems: overcoming challenges to increase access to effective treatment. *Behavioural and Cognitive Psychotherapy, 51*(6), 512-532.

Creswell, C., Hentges, F., Parkinson, M., Sheffield, P., Willetts, L., & Cooper, P. (2010). Feasibility of guided cognitive behaviour therapy (CBT) self-help for childhood anxiety disorders in primary care. *Mental Health in Family Medicine, 7*(1), 49-57.

Creswell, C., Nauta, M.H., Hudson, J. L., March, S., Reardon, T., Arendt, K., … Kendall, P.C. (2021), Research Review: Recommendations for reporting on treatment trials for child and adolescent anxiety disorders – an international consensus statement. *The Journal of Child Psychology and Psychiatry, 62*, 255-269.

Dadds, M. R., Spence, S. H., Holland, D. E., Barrett, P. M., & Laurens, K. R. (1997). Prevention and early intervention for anxiety disorders: A controlled trial. *Journal of Consulting and Clinical Psychology, 65*(4), 627-635.

Dalsgaard, S., McGrath, J., Ostergaard, S. D., Wray, N. R., Pedersen, C. B., Mortensen, P. B., & Petersen, L. (2020). Association of mental disorder in childhood and adolescence with subsequent educational achievement. *JAMA Psychiatry, 25*(8), 25.

de Wilde, A., & Rapee, R. M. (2008). Do controlling maternal behaviours increase state anxiety in children's responses to a social threat? A pilot study. *Journal of Behavior Therapy and Experimental Psychiatry*, *39*(4), 526–537.

Degnan, K.A., Almas, A.N., & Fox, N.A. (2010). Temperament and the environment in the etiology of childhood anxiety: Temperament, anxiety, and environment. *Journal of Child Psychology and Psychiatry, 51*, 497–517.

Dittman, C. K., Farruggia, S. P., Palmer, M. L., Sanders, M. R., Keown, L. J., & Kaslow, N. J. (2014). Predicting success in an online parenting intervention: The role of child, parent, and family factors. *Journal of Family Psychology, 28*(2), 236-243.

Domhardt, M., Geßlein, H., von Rezori, R. E., & Baumeister, H. (2019). Internet- and mobile-based interventions for anxiety disorders: A meta-analytic review of intervention components. *Depression and Anxiety, 36*(3), 213-224.

Domhardt, M., Steubl, L., Boettcher, J., Buntrock, C., Karyotaki, E., Ebert, D. D., . . . Baumeister, H. (2021). Mediators and mechanisms of change in internet- and mobile-based interventions for depression: A systematic review. *Clinical Psychology Review, 83*, 101953.

Donovan, C. L., & March, S. (2014). Online CBT for preschool anxiety disorders: A randomised control trial. *Behaviour Research and Therapy, 58*, 24-35.

Doyle, F. L., Dodd, H. F., Morris, T. M., Lazarus, R. S., Byrow, Y., & Hudson, J. L. (2021). Targeting risk factors for inhibited preschool children: An anxiety prevention programme. *Behaviour Research and Therapy, 147*, 103982.

Drake, K. L., & Ginsburg, G. S. (2012). Family factors in the development, treatment, and prevention of childhood anxiety disorders. *Clinical Child and Family Psychology Review*, *15*(2), 144–162.

Dugas, M. J., Freeston, M. H., & Ladouceur, R. (1997). Intolerance of uncertainty and problem orientation in worry. *Cognitive Therapy and Research*, *21*(6), 593-606.

Dugas, M. J., Gagnon, F., Ladouceur, R., & Freeston, M. H. (1998). Generaized anxiety disorder: a preliminary test of a conceptual model. *Behaviour Research and Therapy*, *36*(2), 215-226.

Dunn, A., Alvarez, J., Arbon, A., Bremner, S., Elsby-Pearson, C., Emsley, R., Jones, C., Lawrence, P., Lester, K. J., Morson, N., Simner, J., Thomson, A., & Cartwright-Hatton, S. (2024). Effectiveness of an unguided modular online intervention for highly anxious parents in preventing anxiety in their children: a parallel group randomised controlled trial. *The Lancet Regional Health. Europe, 45*, 101038.

Essau, C. A. (2005). Frequency and patterns of mental health services utilization among adolescents with anxiety and depressive disorders. *Depression and Anxiety, 22*(3), 130-137.

Essau, C. A., Lewinsohn, P. M., Olaya, B., & Seeley, J. R. (2014). Anxiety disorders in adolescents and psychosocial outcomes at age 30. *Journal of Affective Disorders, 163*, 125-132.

Essau, Cecilia A, Conradt, Judith, Sasagawa, Satoko, & Ollendick, Thomas H. (2011). Prevention of anxiety symptoms in children: Results from a universal school-based trial. *Behavior Therapy, 43*(2), 450-464.

Evans, R., Thirlwall, K., Cooper, P., & Creswell, C. (2017). Using symptom and interference questionnaires to identify recovery among children with anxiety disorders. *Psychological Assessment, 29*, 835.

Feindler, E. L., & Smerling, C. (2022). A review of therapeutic alliance and child CBT. *Child & Family Behavior Therapy*, *44*(1), 18–34.

Festen, H., Hartman, C. A., Hogendoorn, S., de Haan, E., Prins, P. J. M., Reichart, C. G., Moorlag, H., & Nauta, M. H. (2013). Temperament and parenting predicting anxiety change in cognitive behavioral therapy: The role of mothers, fathers, and children. *Journal of Anxiety Disorders, 27*(3), 289-297.

Filges, T., Smedslund, G., Eriksen, T., Birkefoss, K., & Kildemoes, M. W. (2024). The FRIENDS preventive programme for reducing anxiety symptoms in children and adolescents: A systematic review and meta-analysis. *Campbell Systematic Review, 20,* e1443.

Fisak, B. J., Richard, D., & Mann, A. (2011). The prevention of child and adolescent anxiety: A meta-analytic review. *Prevention Science, 12*(3), 255-268.

Fisak, B., Penna, A., Mian, N. D., Lamoli, L., Margaris, A., & Cruz, S. A. M. F. D. (2023). The effectiveness of anxiety interventions for young children: A meta-analytic review. *Journal of Child and Family Studies, 32*(8), 2546–2557.

Flannery-Schroeder, Ellen C., & Kendall, Philip C. (2000). Group and individual cognitive-behavioral treatments for youth with anxiety disorders: A randomized clinical trial. *Cognitive Therapy and Research, 24*(3), 251-278.

Foa, E. B., & Kozak, M. J. (1986). Emotional processing of fear: Exposure to corrective information. *Psychological Bulletin, 99*, 20-35.

Fox, N. A., Zeytinoglu, S., Valadez, E. A., Buzzell, G. A., Morales, S., & Henderson, H. A. (2023). Annual research review: Developmental pathways linking early behavioral inhibition to later anxiety. *Journal of Child Psychology and Psychiatry, 64*(4), 537–561.

Francis, S. E. (2014). The role of parental anxiety sensitivity in parent reports of child anxiety in treatment seeking families. *Clinical Child Psychology and Psychiatry, 19*(1), 111–124.

Fu, R., Gartlehner, G., Grant, M., Shamliyan, T., Sedrakyan, A., Wilt, T. J, . . . Trikalinos, T. A. (2011). Conducting quantitative synthesis when comparing medical interventions: AHRQ and the effective health care programme. *Journal of Clinical Epidemiology, 64*(11), 1187-1197.

Fujii, C., Renno, P., McLeod, B. D., Lin, C. E., Decker, K., Zielinski, K., & Wood, J. J. (2013). Intensive cognitive behavioral therapy for anxiety disorders in school-aged children with autism: A preliminary comparison with treatment-as-usual. *School Mental Health*, *5*(1), 25–37.

Ganella, D. E., & Kim, J. H. (2014). Developmental rodent models of fear and anxiety: From neurobiology to pharmacology. *British journal of pharmacology, 171*(20), 4556-4574.

Gazelle, H., & Rudolph, K. D. (2004). Moving toward and away from the world: Social approach and avoidance trajectories in anxious solitary youth. *Child Development*, *75*(3), 829-849.

Ginsburg, G. S., Becker-Haimes, E. M., Keeton, C., Kendall, P. C., Iyengar, S., Sakolsky, D.… Piacentini, J. (2018). Results from the child/adolescent anxiety multimodal extended long-term study (CAMELS): Primary anxiety outcomes. *Journal of the American Academy of Child and Adolescent Psychiatry, 57*(7), 471-480.

Ginsburg, G. S., Drake, K. L., Tein, J. Y., Teetsel, R., & Riddle, M. A. (2015). Preventing onset of anxiety disorders in offspring of anxious parents: A randomized controlled trial of a family-based intervention. *The American Journal of Psychiatry, 172*(12), 1207-1214.

Ginsburg, G. S., Tein, J.-Y., & Riddle, M. A. (2021). Preventing the onset of anxiety disorders in offspring of anxious parents: A six-year follow-up. *Child Psychiatry and Human Development, 52*(4), 751–760.

Ginsburg, G.S., Siqueland, L., Masia-Warner, C., & Hedtke, K.A. (2004). Anxiety disorders in children: Family matters. *Cognitive and Behavioral Practice, 11*, 28–43.

Goodsell, B., Lawrence, D., Ainley, J., Sawyer, M., Zubrick, S., & Maratos, J. (2017). *Child and adolescent mental health and educational outcomes. An analysis of educational outcomes from young Minds matter: The second Australian child and adolescent survey of mental health and wellbeing.* The University of Western Australia.

Grant, D. M., Wingate, L. R., Rasmussen, K. A., Davidson, C. L., Slish, M. L., Rhoades-Kerswill, S., Mills, A. C., & Judah, M. R. (2013). An Examination of the Reciprocal Relationship Between Avoidance Coping and Symptoms of Anxiety and Depression. *Journal of Social and Clinical Psychology*, *32*(8), 878-896.

Greco, V., & Roger, D. (2001). Coping with uncertainty: the construction and validation of a new measure. *Personality and Individual Differences*, *31*(4), 519-534.

Greco, V., & Roger, D. (2003). Uncertainty, stress, and health. *Personality and Individual Differences*, *34*(6), 1057-1068.

Green, I., Reardon, T., Button, R., Williamson, V., Halliday, G., Hill, C., Larkin, M., Sniehotta, F. F., Ukoumunne, O. C., Ford, T., Spence, S. H., Stallard, P., & Creswell, C. (2023). Increasing access to evidence-based treatment for child anxiety problems: online parent-led CBT for children identified via schools. *Child and Adolescent Mental Health, 28*(1), 42-51.

Harrer, M., Cuijpers, P., Furukawa, T. & Ebert, D. D. (2019). *dmetar: companion R Package for the guide 'Doing Meta-Analysis in R'. R package version 0.1.0.* URL http://dmetar.protectlab.org/.

Hayes, A. M., Laurenceau, J., Feldman, G., Strauss, J. L., & Cardaciotto, L. (2007). Change is not always linear: The study of nonlinear and discontinuous patterns of change in psychotherapy. *Clinical Psychology Review, 27*(6), 715-723.

Hebert, E. A., & Dugas, M. J. (2019). Behavioral experiments for intolerance of uncertainty: challenging the unknown in the treatment of generalized anxiety disorder. *Cognitive and Behavioral Practice*, *26*(2), 421-436.

Herren, C., In-Albon, T., & Schneider, S. (2013). Beliefs regarding child anxiety and parenting competence in parents of children with separation anxiety disorder. *Journal of Behavior Therapy and Experimental Psychiatry, 44*(1), 53-60

Higa-McMillan, C. K., Francis, S. E., Rith-Najarian, L., & Chorpita, B. F. (2016). Evidence base update: 50 years of research on treatment for child and adolescent anxiety. *Journal of Clinical Child and Adolescent Psychology, 45*(2), 91-113.

Higgins, J., Thomas, J., Chandler, J., Cumpston, M., Li, T., Page, M., & Welch, V. (2020). *Cochrane handbook for systematic reviews of interventions (Second ed.).* Hoboken, NJ.

Hill, C., Chessell, C., Percy, R., & Creswell, C. (2022a). Online Support and Intervention (OSI) for child anxiety: A case series within routine clinical practice. *Behavioural and Cognitive Psychotherapy, 50*, 429-445.

Hill, C., Reardon, T., Taylor, L., & Creswell, C. (2022b). Online support and Intervention for Child Anxiety (OSI): Development and usability testing. *JMIR Formative Research, 6*, e29846.

Hill, N. E., & Bush, K. R. (2001). Relationships between parenting environment and children's mental health among African American and European American mothers and children. *Journal of Marriage and Family, 63*(4), 954-966.

Hogendoorn, S. M., Prins, P. J. M., Boer, F., Vervoort, L., Wolters, L. H., Moorlag, H., Nauta, M. H., Garst, H., Hartman, C. A., & de Haan, E. (2014). Mediators of cognitive

behavioral therapy for anxiety disordered children and adolescents: Cognition, perceived control, and coping. *Journal of Clinical Child and Adolescent Psychology, 43*(3), 486-500.

Holmbeck, G. N., Johnson, S. Z., Wills, K. E., McKernon, W., Rose, B., Erklin, S., & Kemper, T. (2002). Observed and perceived parental overprotection in relation to psychosocial adjustment in preadolescents with a physical disability: The mediational role of behavioral autonomy. *Journal of Consulting and Clinical Psychology, 70*, 96-110.

Howe. V. E., Zwicker, A., Uher, R., & Pavlova, B. (2020). Cognitive-behavioural interventions for prevention and treatment of anxiety in young children: A systematic review and meta-analysis. *Clinical psychology Review, 81*, 101904.

Hudson, J. L., & Dodd, H. F. (2012). Informing early intervention: Preschool predictors of anxiety disorders in middle childhood. *PloS One*, *7*(8), e42359.

Hyland, S., Mackin, D. M., Goldstein, B. L., Finsaas, M. C., & Klein, D. N. (2022). Agreement, stability, and validity of parent- and youth-reported anxiety symptoms from childhood to adolescence. *Journal of Abnormal Child Psychology, 50*(11), 1445–1455.

Jacobson, N. S., Martell, C. R., & Dimidjian, S. (2001). Behavioral activation treatment for depression: Returning to contextual roots. *Clinical Psychology (New York, N.Y.)*, *8*(3), 255–270.

James, A. C., Reardon, T., Soler, A., James, G., & Creswell, C. (2020). Cognitive behavioural therapy for anxiety disorders in children and adolescents. *The Cochrane database of systematic reviews, 11*(11), CD013162.

Johnston, C., & Mash, E. J. (1989). A Measure of parenting satisfaction and efficacy. *Journal of Clinical Child Psychology*, *18*(2), 167-175.

Jones, T. L., & Prinz, R. J. (2005). Potential roles of parental self-efficacy in parent and child adjustment: A review. *Clinical Psychology Review*, *25*(3), 341-363.

Jongerden, L., & Bögels, S. M. (2015). Parenting, family functioning and anxiety-disordered children: Comparisons to controls, changes after family versus child CBT. *Journal of Child and Family Studies*, *24*(7), 2046–2059.

Kagan, J., Snidman, N., Zentner, M., & Peterson, E. (1999). Infant temperament and anxious symptoms in school age children. *Development and Psychopathology, 11*(2), 209-224.

Kazdin, A. E. (2007). Mediators and mechanisms of change in psychotherapy research. *Annual Review of Clinical Psychology, 3*, 1-27.

Keijsers, G. P. J., Schaap, C. P. D. R., & Hoogduin, C. A. L. (2000). The impact of interpersonal patient and therapist behavior on outcome in cognitive-behavior therapy: A review of empirical studies. *Behavior Modification, 24*(2), 264-297.

Keijsers, G. P. J., Schaap, C. P. D. R., Hoogduin, C., Hoogsteyns, B., & de Kemp, E. C. M. (1999). Preliminary results of a new instrument to assess patient motivation for treatment in cognitive-behaviour therapy. *Behavioural and Cognitive Psychotherapy, 27*(2), 165–179.

Kendall, P. C. (1993). Cognitive-behavioral therapies with youth. *Journal of Consulting and Clinical Psychology, 61*(2), 235-247.

Kendall, P. C. (1994). Treating anxiety disorders in children: Results of a randomized clinical trial. *Journal of Consulting and Clinical Psychology, 62*(1), 100-110.

Kendall, P. C., Comer, J. S., Marker, C. D., Creed, T. A., Puliafico, A. C., Hughes, A. A., et al. (2009). In-session exposure tasks and therapeutic alliance across the treatment of childhood anxiety disorders. *Journal of Consulting and Clinical Psychology, 77*(3), 517-525.

Kendall, P. C., Cummings, C. M., Villabø, M. A., Narayanan, M. K., Treadwell, K., Birmaher, B., Compton, S., Piacentini, J., Sherrill, J., Walkup, J., Gosch, E., Keeton, C., Ginsburg, G., Suveg, C., & Albano, A. M. (2016). Mediators of change in the child/adolescent anxiety multimodal treatment study. *Journal of Consulting and Clinical Psychology, 84*(1), 1-14.

Kendall, P. C., Flannery-Schroeder, E., Panichelli-Mindel, S. M., Southam-Gerow, M., Henin, A., & Warman, M. (1997). Therapy for youths with anxiety disorders: A second randomized clincal trial. *Journal of Consulting and Clinical Psychology, 65*(3), 366–380.

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry, 62*(6), 593-602.

Kleiboer, A., Donker, T., Seekles, W., van Straten, A., Riper, H., & Cuijpers, P. (2015). A randomized controlled trial on the role of support in Internet-based problem-solving therapy for depression and anxiety. *Behaviour Research and Therapy, 72*, 63-71.

Knapp, M., King, D., Healey, A., & Thomas, C. (2011). Economic outcomes in adulthood and their associations with antisocial conduct, attention deficit and anxiety problems in childhood. *The Journal of Mental Health Policy and Economics, 14*(3), 137-147.

Knight, A., McLellan, L., Jones, M., & Hudson, J. (2014). Pre-treatment predictors of outcome in childhood anxiety disorders: A systematic review. *Psychopathology Review, a1*(1), 77-129.

Kodal, A., Fjermestad, K. W., Bjelland, I., Gjestad, R., Öst, L.-G., Bjaastad, J. F., Haugland, B. S. M., Havik, O. E., Heiervang, E. R., & Wergeland, G. J. H. (2018). Predictors of long-term outcome of CBT for youth with anxiety disorders treated in community clinics. *Journal of Anxiety Disorders, 59*, 53-63.

Kraemer, H. C., Wilson, G. T., Fairburn, C. G., & Agras, W. S. (2002). Mediators and moderators of treatment effects in randomized clinical trials. *Archives of General Psychiatry, 59*(10), 877-883.

Kroenke, K., Spitzer, R. L., Williams, J. B., Monahan, P. O., & Löwe, B. (2007). Anxiety disorders in primary care: prevalence, impairment, comorbidity, and detection. *Annals of internal medicine, 146*(5), 317-325.

Kunas, S. L., Lautenbacher, L. M., Lueken, U., & Hilbert, K. (2021). Psychological predictors of cognitive-behavioral therapy outcomes for anxiety and depressive disorders in children and adolescents: A systematic review and meta-analysis. *Journal of Affective Disorders, 278*, 614-626.

Lahat, A., Hong, M., & Fox, N. A. (2011). Behavioural inhibition: Is it a risk factor for anxiety? *International Review of Psychiatry (Abingdon, England), 23*(3), 248–257.

Lawrence, P. J, Rooke, S. M, & Creswell, C. (2017). Review: Prevention of anxiety among at-risk children and adolescents – a systematic review and meta-analysis. *Child and Adolescent Mental Health, 22*(3), 118-130.

Lawrence, P. J., Murayama, K., & Creswell, C. (2019). Systematic review and meta-analysis: Anxiety and depressive disorders in offspring of parents with anxiety disorders. *Journal of the American Academy of Child and Adolescent Psychiatry*, *58*(1), 46–60.

Lebowitz, E. R. (2017). Mother and Child Ratings of Child Anxiety: Associations with behavioral avoidance and the role of family accommodation. *Parenting, Science and Practice*, *17*(2), 124-142.

Lebowitz, E. R., Shic, F., Campbell, D., Basile, K., & Silverman, W. K. (2015). Anxiety sensitivity moderates behavioral avoidance in anxious youth. *Behaviour Research and Therapy*, *74*, 11–17.

Lebowitz, E.R., Woolston, J., Bar-Haim, Y., Calvocoressi, L., Dauser, C., Warnick, E., . . . & Leckman, J.F. (2013). Family accommodation in pediatric anxiety disorders. *Depression and Anxiety, 30*, 47–54.

Legerstee, J. S., Huizink, A. C., Van Gastel, W., Liber, J. M., Treffers, P. D. A., Verhulst, F. C., & Utens, E. M. W. J. (2008). Maternal anxiety predicts favourable treatment outcomes in anxiety-disordered adolescents. *Acta Psychiatrica Scandinavica*, *117*(4), 289-298.

Leijten, P., Raaijmakers, M. A. J., de Castro, B. O., & Matthys, W. (2013). Does socioeconomic status matter? A meta-analysis on parent training effectiveness for disruptive child behavior. *Journal of Clinical Child and Adolescent Psychology, 42*(3), 384-392.

Lenz, A. S. (2015). Meta-analysis of the Coping Cat programme for decreasing severity of anxiety symptoms among children and adolescents. *Journal of Child and Adolescent Counseling, 1*(2), 51-65.

Leong, J., Cobham, V. E., de Groot, J., & McDermott, B. (2009). Comparing different modes of delivery: A pilot evaluation of a family-focused, cognitive-behavioral intervention for anxiety-disordered children. *European Child & Adolescent Psychiatry, 18*, 231-239.

Lewis-Morrarty, E., Degnan, K.A., Chronis-Tuscano, A., Rubin, K.H., Cheah, C.S.L., Pine, D.S., . . . & Fox, N.A. (2012). Maternal over-control moderates the association between early childhood behavioral inhibition and adolescent social anxiety symptoms. *Journal of Abnormal Child Psychology, 40*, 1363–1373.

Liber, J. M., van Widenfelt, B. M., Goedhart, A. W., Utens, E. M., van der Leeden, A. J., Markus, M. T., & Treffers, P. D. (2008). Parenting and parental anxiety and depression as predictors of treatment outcome for childhood anxiety disorders: Has the role of fathers been underestimated? *Journal of Clinical Child and Adolescent Psychology, 37*(4), 747-75.

Liber, J. M., van Widenfelt, B. M., van der Leeden, A. J. M., Goedhart, A. W., Utens, E. M. W. J., & Treffers, P. D. A. (2010). The relation of severity and comorbidity to treatment outcome with cognitive behavioral therapy for childhood anxiety disorders. *Journal of Abnormal Child Psychology*, *38*(5), 683-694.

Little, R. J. A., & Rubin, D. B. (2002). *Statistical analysis with missing data (2nd ed.).* Hoboken, NJ: Wiley.

Lock, S., & Barrett, P. M. (2003). A longitudinal study of developmental differences in universal preventive intervention for child anxiety. *Behaviour Change, 20*(4), 183-199.

Lowry-Webster, Hayley M., Barrett, Paula M., & Dadds, Mark R. (2001). A universal prevention trial of anxiety and depressive symptomatology in childhood: Preliminary data from an Australian study. *Behaviour Change, 18*(1), 36-50.

Lundahl, B., Risser, H. J., & Lovejoy, M. C. (2006). A meta-analysis of parent training: Moderators and follow-up effects. *Clinical Psychology Review, 26*(1), 86-104.

Lundkvist-Houndoumadi, I., Hougaard, E., & Thastum, M. (2014). Pre-treatment child and family characteristics as predictors of outcome in cognitive behavioural therapy for youth anxiety disorders. *Nordic Journal of Psychiatry, 68*(8), 524-535.

Luo, A., & McAloon, J. (2021). Potential mechanisms of change in cognitive behavioral therapy for childhood anxiety: A meta-analysis. *Depression and Anxiety, 38*(2), 220-232.

Lyneham, H. J., & Rapee, R. M. (2005). Agreement between telephone and in-person delivery of a structured interview for anxiety disorders in children. *Journal of the American Academy of Child and Adolescent Psychiatry, 44*(3), 274-282.

Lyneham, H. J., & Rapee, R. M. (2006). Evaluation of therapist-supported parent-implemented CBT for anxiety disorders in rural children. *Behaviour Research and Therapy, 44*, 1287-1300.

Manassis, K., Lee, T. C., Bennett, K., Zhao, X. Y., Mendlowitz, S., Duda, S., Saini, M., Wilansky, P., Baer, S., Barrett, P., Bodden, D., Cobham, V. E., Dadds, M. R., Flannery-Schroeder, E., Ginsburg, G., Heyne, D., Hudson, J. L., Kendall, P. C., Liber, J., … Wood, J. J. (2014). Types of parental involvement in CBT with anxious youth: A preliminary meta-analysis. *Journal of Consulting and Clinical Psychology, 82*(6), 1163-1172.

Manley, H., Tu, E.-N., Reardon, T., & Creswell, C. (2023). The relationship between teachers' day-to-day classroom management practices and anxiety in primary school children: A systematic review. *Review of Education, 11*, e3385.

Mars, B., Heron, J., Klonsky, E. D., Moran, P., O'Connor, R. C., Tilling, K., & Gunnell, D. (2019). What distinguishes adolescents with suicidal thoughts from those who have attempted suicide? A population-based birth cohort study. *The Journal of Child Psychology and Psychiatry and Allied Disciplines, 60*(1), 91-99.

Mathes, B. M., Oglesby, M. E., Short, N. A., Portero, A., Raines, A. M., & Schmidt, N. B. (2017). An examination of the role of intolerance of distress and uncertainty in hoarding symptoms. *Comprehensive Psychiatry*, *72*, 121–129.

Mayer-Brien, S., Turgeon, L., & Lanovaz, M. J. (2017). Effects of a parent training programme for the treatment of young children with separation anxiety disorder. *Cognitive Behaviour Therapist*, *10,* e12.

McLellan, L. F., Woon, S., Hudson, J. L., Lyneham, H. J., Karin, E., & Rapee, R. M. (2024). Treating child anxiety using family-based internet delivered cognitive behavior therapy with brief therapist guidance: A randomized controlled trial. *Journal of Anxiety Disorders, 101,* 102802.

McLeod, B. D., Wood, J. J., & Weisz, J. R. (2007). Examining the association between parenting and childhood anxiety: A meta-analysis. *Clinical Psychology Review*, *27*(2), 155-172.

McLoone, J. K., & Rapee, R. M. (2012). Comparison of an anxiety management programme for children implemented at home and school: Lessons learned. *School Mental Health, 4*(4), 231-242.

Mesman, J., & Koot, H. M. (2000). Child-reported depression and anxiety in preadolescence: Associations with parent- and teacher-reported problems. *Journal of the American Academy of Child and Adolescent Psychiatry, 39*(11), 1371–1378.

Miller, L. D., Laye-Gindhu, A., Bennett, J. L., Liu, Y., Gold, S., March, J. S., Olson, B. F., & Waechtler, V. E. (2011). An effectiveness study of a culturally enriched school-based CBT anxiety prevention programme. *Journal of Clinical Child and Adolescent Psychology*, *40*(4), 618-629.

Morgan, A. J., Rapee, R. M., Salim, A., & Bayer, J. K. (2018). Predicting response to an internet-delivered parenting programme for anxiety in early childhood. *Behavior Therapy, 49*(2), 237–248.

Morgan, A. J., Rapee, R. M., Salim, A., Goharpey, N., Tamir, E., McLellan, L. F., & Bayer, J. K. (2017). Internet-delivered parenting programme for prevention and early intervention of anxiety problems in young children: Randomized controlled trial. *Journal of the American Academy of Child and Adolescent Psychiatry, 56*(5), 417-425.

Ollendick, T. H., Langley, A. K., Jones, R. T., & Kephart, C. (2001). Fear in children and adolescents: Relations with negative Life events, Attributional style, and avoidant coping. *Journal of Child Psychology and Psychiatry*, *42*(8), 1029–1034.

Osmanağaoğlu, N., Creswell, C., & Dodd, H. F. (2018). Intolerance of uncertainty, anxiety, and worry in children and adolescents: A meta-analysis. *Journal of Affective Disorders, 225*, 80-90.

Palitz, S. A., Rifkin, L. S., Norris, L. A., Knepley, M., Fleischer, N. J., Steinberg, L., & Kendall, P. C. (2019). But what will the results be? Learning to tolerate uncertainty is associated with treatment-produced gains. *Journal of Anxiety Disorders*, *68*, 102146.

Parker, K., Nunns, M., Xiao, Z., Ford, T., & Ukoumunne, O. C. (2021). Characteristics and practices of school-based cluster randomised controlled trials for improving health outcomes in pupils in the United Kingdom: A methodological systematic review. *BMC Medical Research Methodology, 21*(1), 152.

Pella, J. E., Slade, E. P., Pikulski, P. J., & Ginsburg, G. S. (2020). Pediatric anxiety disorders: A cost of illness analysis. *Journal of Abnormal Child Psychology, 48*(4), 551-559.

Pereira, A. I., Muris, P., Roberto, M. S., Marques, T., Goes, R., & Barros, L. (2018). Examining the mechanisms of therapeutic change in a cognitive-behavioral intervention for anxious children: The role of interpretation bias, perceived control, and coping strategies. *Child Psychiatry and Human Development*, *49*(1), 73–85.

Pérez-Edgar, K., LoBue, V., & Buss, K.A. (2021). From parents to children and back again: Bidirectional processes in the transmission and development of depression and anxiety. *Depression and Anxiety, 38*, 1198–1200.

Perihan, C., Burke, M., Bowman-Perrott, L., Bicer, A., Gallup, J., Thompson, J., & Sallese, M. (2020). Effects of cognitive behavioral therapy for reducing anxiety in children with high functioning ASD: A systematic review and meta-analysis. *Journal of Autism and Developmental Disorders*, *50*(6), 1958–1972.

Peris, T. S., Compton, S. N., Kendall, P. C., Birmaher, B., Sherrill, J., March, J., Gosch, E., Ginsburg, G., Rynn, M., McCracken, J. T., Keeton, C. P., Sakolsky, D., Suveg, C., Aschenbrand, S., Almirall, D., Iyengar, S., Walkup, J. T., Albano, A. M., & Piacentini, J. (2015). Trajectories of change in youth anxiety during cognitive-behavior therapy. *Journal of Consulting and Clinical Psychology*, *83*(2), 239–252.

Podina, I. R., Mogoase, C., David, D., Szentagotai, A., & Dobrean, A. (2016). A meta-analysis on the efficacy of technology mediated CBT for anxious children and adolescents. *Journal of Rational-emotive and Cognitive-behavior Therapy, 34*(1), 31-50.

Polanczyk, G.V, Salum, G.A., Sugaya, L.S., Caye, A, & Rohde, L. A. (2015). Annual research review: a meta-analysis of the worldwide prevalence of mental disorders in children and adolescents. *Journal of Child Psychology and Psychiatry, 56*(3), 345-365.

Pollard, J., Reardon, T., Williams, C., Creswell, C., Ford, T., Gray, A., Roberts, N., Stallard, P., Ukoumunne, O. C., & Violato, M. (2023). The multifaceted consequences and economic costs of child anxiety problems: A systematic review and meta-analysis. *JCPP Advances, 3*(3), e12149-n/a

Popp, L., Neuschwander, M., Mannstadt, S., In-Albon, T., & Schneider, S. (2017). Parent-child diagnostic agreement on anxiety symptoms with a structured diagnostic interview for mental disorders in children. *Frontiers in Psychology, 8*, 404.

Prior, M., Sanson, A., Oberklaid, F., & Northam, E. (1987). Measurement of temperament in one- to three-year-old children. *International Journal of Behavioral Development, 10*(1), 121-132.

Rapee, R. M. (2000). Group treatment of children with anxiety disorders: Outcome and predictors of treatment response. *Australian Journal of Psychology, 52*(3), 125–129.

Rapee, R. M., Abbott, M. J., & Lyneham, H. J. (2006). Bibliotherapy for children with anxiety disorders using written materials for parents: A Randomized Controlled Trial. *Journal of Consulting and Clinical Psychology, 74*(3), 436-444.

Rapee, R. M., Creswell, C., Kendall, P. C., Pine, D. S., & Waters, A. M. (2023). Anxiety disorders in children and adolescents: A summary and overview of the literature. *Behaviour Research and Therapy, 168*, 104376.

Rapee, R. M., Kennedy, S., Ingram, M., Edwards, S., & Sweeney, L. (2005). Prevention and early intervention of anxiety disorders in inhibited preschool children. *Journal of Consulting and Clinical Psychology, 73*(3), 488-497.

Rapee, R. M., Spence, S. H., Cobham, V. E., & Wignall, A. (2000a). *Helping your anxious child: A step-by-step guide for parents.* Oakland, CA; New Harbinger.

Rapee, R. M., Wignall, A., Hudson, J. L., & Schniering, C. A. (2000b). *Evidence-based treatment of child and adolescent anxiety disorders.* Oakland, CA: New Harbinger.

Rapee, R.M., Kennedy, S.J., Ingram, M., Edwards, S.L., & Sweeney, L. (2010). Altering the trajectory of anxiety in at risk young children. *American Journal of Psychiatry, 167*, 1518–1525.

Rapee, R.M., Lyneham, H.J., Wuthrich, V., Chatterton, M.L., Hudson, J.L., Kangas, M., & Mihalopoulos, C. (2017). Comparison of stepped care delivery against a single, empirically validated cognitive-behavioral therapy programme for youth with anxiety: A randomized clinical trial. *Journal of the American Academy of Child & Adolescent Psychiatry, 56*, 841-848.

Rasing, S. P. A., Creemers, D. H. M., Janssens, J. M. A. M., & Scholte, R. H. J. (2017). Depression and anxiety prevention based on cognitive behavioral therapy for at-risk adolescents: A meta-analytic review. *Frontiers in psychology, 8*, 1066.

Reardon, T., Dodd, H., Hill, C., Jasper, B., Lawrence, P. J., Morgan, F., . . . Creswell, C. (2022). Minimising young children's anxiety through schools (MY-CATS): Protocol for a cluster randomised controlled trial to evaluate the effectiveness and cost-effectiveness of an online parent-led intervention compared with usual school practice for young children identified as at risk of anxiety disorders. *Trials, 23*(1), 149.

Reardon, T., Harvey, K., Baranowska, M., O'brien, D., Smith, L., & Creswell, C. (2017). What do parents perceive are the barriers and facilitators to accessing psychological treatment for mental health problems in children and adolescents? A systematic review of qualitative and quantitative studies. *European Child & Adolescent Psychiatry, 26*(6), 623-647.

Reardon, T., Ukoumunne, O. C., Dodd, H. F., Halliday, G., Hill, C., Jasper, B., Jones, B., Lawrence, P. J., Morgan, F., Placzek, A., Rapee, R. M., Violato, M., Yu, S., Team, MYCATS, Creswell, C (2024). Parent-led CBT delivered via online and telephone support alongside usual school practice versus usual school practice only for young children identified as at-risk for anxiety disorders through screening in schools: A cluster randomised controlled trial. available at: SSRN: https://ssrn.com/abstract=5027298 or http://dx.doi.org/10.2139/ssrn.5027298

Reyno, S. M., & McGrath, P. J. (2006). Predictors of parent training efficacy for child externalizing behavior problems: A meta-analytic review. *Journal of Child Psychology and Psychiatry, 47*(1), 99-111.

Richards, D., & Richardson, T. (2012). Computer-based psychological treatments for depression: A systematic review and meta-analysis. *Clinical Psychology Review*, *32*(4), 329-342.

Rubin, D.B. (1987). *Multiple imputation for nonresponse in surveys.* New York: John Wiley & Sons.

Ryan, S.M., & Ollendick, T.H. (2018). The interaction between child behavioral inhibition and parenting behaviors: Effects on internalizing and externalizing symptomology. *Clinical Child and Family Psychology Review, 21*, 320–339.

Ryan, Z. J., Rayson, H., Morriss, J., & Dodd, H. F. (2025). Does intolerance of uncertainty predict child generalised anxiety? A longitudinal study. *Journal of Anxiety Disorders*, *112*, Article 103004.

Salkovskis, P. M. (1991). The importance of behaviour in the maintenance of anxiety and panic: A cognitive account. *Behavioural Psychotherapy, 19*(1), 6-19.

Sanchez, A. L., Cornacchio, D., Chou, T., Leyfer, O., Coxe, S., Pincus, D., & Comer, J. S. (2017). Development of a scale to evaluate young children's responses to uncertainty and low environmental structure. *Journal of Anxiety Disorders*, *45*, 17-23.

Sandler, I. N., Tein, J.-Y., Mehta, P., Wolchik, S., & Ayers, T. (2000). Coping Efficacy and Psychological Problems of Children of Divorce. *Child Development*, *71*(4), 1099–1118.

Sandstrom, A., Uher, R., & Pavlova, B. (2020). Prospective association between childhood behavioral inhibition and anxiety: A meta-analysis. *Journal of Abnormal Child Psychology*, *48*(1), 57–66.

Sanson, A., Pedlow, R., Cann, W., Prior, M., & Oberklaid, F. (1996). Shyness ratings: Stability and correlates in early childhood. *International Journal of Behavioral Development, 19*(4), 705-724.

Schafer, J.L. (1997). *Analysis of incomplete multivariate data.* London: Chapman & Hall.

Sexton, K. A., & Dugas, M. J. (2009). Defining distinct negative beliefs about uncertainty: Validating the factor structure of the Intolerance of Uncertainty Scale. *Psychological Assessment*, *21*(2), 176–186.

Shamir-Essakow, G., Ungerer, J. A., & Rapee, R. M. (2005). Attachment, behavioral inhibition, and anxiety in preschool children. *Journal of Abnormal Child Psychology, 33*(2), 131–143.

Shevlin, M., McElroy, E., & Murphy, J. (2017). Homotypic and heterotypic psychopathological continuity: A child cohort study. *Social Psychiatry and Psychiatric Epidemiology, 52*(9), 1135-1145.

Silverman, W. K., & Albano, A. M. (1996). *The anxiety disorders interview schedule for children and parents— DSM-IV version.* Graywind, New York.

Simon, E., Bögels, S. M., & Voncken, J. M. (2011). Efficacy of child-focused and parent-focused interventions in a child anxiety prevention study. *Journal of Clinical Child and Adolescent Psychology, 40*(2), 204-219.

Smith, A. M., Flannery-Schroeder, E. C., Gorman, K. S., & Cook, N. (2014). Parent cognitive-behavioral intervention for the treatment of childhood anxiety disorders: A pilot study. *Behaviour Research and Therapy, 61,* 156-161.

Smith, M. M., McLeod, B. D., Southam-Gerow, M. A., Jensen-Doss, A., Kendall, P. C., & Weisz, J. R. (2017). Does the delivery of CBT for youth anxiety differ across research and practice settings? *Behavior Therapy, 48*(4), 501-516.

Solmi, M., Radua, J., Olivola, M., Croce, E., Soardo, L., Salazar de Pablo, G., . . . Fusar-Poli, P. (2021). Age at onset of mental disorders worldwide: Large-scale meta-analysis of 192 epidemiological studies. *Molecular Psychiatry, 27*(1), 281-295.

Southam-Gerow, M. A., Kendall, P. C., Weersing, V. R. (2001). Examining outcome variability: Correlates of treatment response in a child and adolescent anxiety clinic. *Journal of Clinical Child and Adolescent Psychology, 30*(3), 422-436.

Spek, V., Cuijpers, P., Nyklicek, I., Riper, H., Keyzer, J., & Pop, V. (2007). Internet-based cognitive behaviour therapy for symptoms of depression and anxiety: a meta-analysis. *Psychological Medicine, 37*(3), 319-328.

Spence, S. H., Prosser, S. J., March, S., & Donovan, C. L. (2020). Internet-delivered cognitive behavior therapy with minimal therapist support for anxious children and adolescents: predictors of response. *Journal of Child Psychology and Psychiatry, 61*(8), 914-927.

Spence, S. H., Rapee, R., McDonald, C., & Ingram, M. (2001). The structure of anxiety symptoms among preschoolers. *Behaviour Research and Therapy, 39*, 1293-1316.

Sperling, J. (2023). The role of intolerance of uncertainty in treatment for pediatric anxiety disorders and obsessive-compulsive disorder. *Evidence-Based Practice in Child and Adolescent Mental Health, 8*(4), 429-438.

Spitzer, R. L, Kroenke, K, Williams, J. B. W, & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine (1960), 166*(10), 1092-1097.

Stallard, P., Skryabina, E., Taylor, G., Phillips, R., Daniels, H., Anderson, R., & Simpson, N. (2014). Classroom-based cognitive behaviour therapy (FRIENDS): A cluster randomised controlled trial to Prevent Anxiety in Children through Education in Schools (PACES). *The Lancet Psychiatry, 1,* 185-192.

Stevens, K., Rogers, T., Campbell, M., Björgvinsson, T., & Kertz, S. (2018). A transdiagnostic examination of decreased intolerance of uncertainty and treatment outcome. *Cognitive Behaviour Therapy*, *47*(1), 19–33.

Stockings, E.A., Degenhardt, L., Dobbins, T., Lee, Y.Y., Erskine, H.E., Whiteford, H.A., & Patton, G. (2016). Preventing depression and anxiety in young people: A review of the

joint efficacy of universal, selective and indicated prevention. *Psychological Medicine, 46*, 11–26.

Swain, J., Hancock, K., Hainsworth, C., & Bowman, J. (2015). Mechanisms of change: Exploratory outcomes from a randomised controlled trial of acceptance and commitment therapy for anxious adolescents. *Journal of Contextual Behavioral Science, 4*(1), 56–67.

Taylor, L., Giles, S., Howitt, S., Ryan, Z., Brooks, E., Radley, L., Thomson, A., Whitaker, E., Knight, F., Hill, C., Violato, M., Waite, P., Raymont, V., Yu, L.-M., Harris, V., Williams, N., & Creswell, C. (2022). A randomised controlled trial to compare clinical and cost-effectiveness of an online parent-led treatment for child anxiety problems with usual care in the context of COVID-19 delivered in Child and Adolescent Mental Health Services in the UK (Co-CAT): a study protocol for a randomised controlled trial. *Current Controlled Trials in Cardiovascular Medicine, 23*(1), 942.

Teubert, D. & Prinquart, M. (2011). A meta-analytic review on the prevention of symptoms of anxiety in children and adolescents. *Journal of Anxiety Disorders, 25*(8), 1046-1059.

Thirlwall, K., & Creswell, C. (2010). The impact of maternal control on children's anxious cognitions, behaviours and affect: An experimental study. *Behaviour Research and Therapy*, *48*(10), 1041–1046.

Thirlwall, K., Cooper, P. J., Karalus, J., Voysey, M., Willetts, L., & Creswell, C. (2013). Treatment of child anxiety disorders via guided parent-delivered cognitive–behavioural therapy: Randomised controlled trial. *British Journal of Psychiatry, 203*(6), 436-444.

Thirlwall, K., Cooper, P., & Creswell, C. (2017). Guided parent-delivered cognitive behavioral therapy for childhood anxiety: predictors of treatment response. *Journal of Anxiety Disorders, 45,* 43-48.

Thorne, K. J., Andrews, J. J. W., & Nordstokke, D. (2013). Relations among children's coping strategies and anxiety: The mediating role of coping efficacy. *The Journal of General Psychology*, *140*(3), 204–223.

Thwaites, R., & Bennett-Levy, J. (2007). Conceptualizing empathy in cognitive behaviour therapy: Making the implicit explicit. *Behavioural and Cognitive Psychotherapy, 35*(5), 591-612.

Towe-Goodman, N. R., Franz, L., Copeland, W., Angold, A., & Egger, H. (2014). Perceived family impact of preschool anxiety disorders. *Journal of the American Academy of Child & Adolescent Psychiatry, 53*(4), 437-446.

Van Der Bruggen, C. O., Stams, G. J. J. M., & Bögels, S. M. (2008). Research Review: The relation between child and parent anxiety and parental control: a meta-analytic review. *Journ*

van Starrenburg, M. L. A., Kuijpers, R. C. M. W., Kleinjan, M., Hutschemaekers, G. J. M., & Engels, R. C. M. E. (2017). Effectiveness of a cognitive behavioral therapy-based indicated prevention programme for children with elevated anxiety levels: A randomized controlled trial. *Prevention Science*, *18*(1), 31-39.

van Starrenburg, M. L. A., Kuijpers, R. C. W. M., Hutschemaekers, G. J. M., & Engels, R. C. M. E. (2013). Effectiveness and underlying mechanisms of a group-based cognitive behavioural therapy-based indicative prevention programme for children with elevated anxiety levels. *BMC Psychiatry, 13*(1), 183.

van Steensel, F. J., Dirksen, C. D., & Bogels, S. M. (2013). A cost of illness study of children with high-functioning autism spectrum disorders and comorbid anxiety disorders as compared to clinically anxious and typically developing children. *Journal of Autism & Developmental Disorders, 43*(12), 2878-2890.

Viechtbauer, W. (2010). Conducting meta-analyses in R with the metafor package. *Journal of Statistical Software, 36*, 1-48.

Villabø, M. A., Narayanan, M., Compton, S. N., Kendall, P. C., & Neumer, S.-P. (2018). Cognitive-behavioral therapy for youth anxiety: An effectiveness evaluation in community practice. *Journal of Consulting and Clinical Psychology, 86*(9), 751-764.

Vo, T.-T., Superchi, C., Boutron, I., & Vansteelandt, S. (2020). The conduct and reporting of mediation analysis in recently published randomized controlled trials: Results from a methodological systematic review. *Journal of Clinical Epidemiology, 117*, 78-88.

Vreeke, L.J., Muris, P., Mayer, B., Huijding, J., & Rapee, R.M. (2013). Skittish, shielded, and scared: Relations among behavioral inhibition, overprotective parenting, and anxiety in native and non-native Dutch preschool children. *Journal of Anxiety Disorders, 27*, 703–710.

Walker, J. V. (2012). Parental factors that detract from the effectiveness of Cognitive-Behavioral treatment for childhood anxiety: Recommendations for practitioners. *Child & Family Behavior Therapy*, *34*(1), 20–32.

Walkup, J. T., Albano, A. M., Piacentini, J., Birmaher, B., Compton, S. N., Sherrill, J. T., Ginsburg, G. S., Rynn, M. A., McCracken, J., Waslick, B., Iyengar, S., March, J. S., & Kendall, P. C. (2008). Cognitive behavioral therapy, sertraline, or a combination in childhood anxiety. *The New England Journal of Medicine*, *359*(26), 2753-2766.

Waters, A. M., Craske, M. G., Bergman, R. L., & Treanor, M. (2008). Threat interpretation bias as a vulnerability factor in childhood anxiety disorders. *Behaviour Research and Therapy*, *46*(1), 39–47.

Waters, A. M., Theresiana, C., Neumann, D. L., & Craske, M. G. (2017). Developmental differences in aversive conditioning, extinction, and reinstatement: A study with children, adolescents, and adults. *Journal of Experimental Child Psychology, 159*, 263-278.

Weems, C. F., Silverman, W. K., Rapee, R. M., & Pina, A. A. (2003). The role of control in childhood anxiety disorders. *Cognitive Therapy and Research*, *27*(5), 557–568.

Wergeland, G. J., Fjermestad, K. W., Marin, C. E., Bjelland, I., Haugland, B. S., Silverman, W. K. … Heiervang, E. R. (2016). Predictors of treatment outcome in an effectiveness trial of cognitive behavioral therapy for children with anxiety disorders. *Behaviour research and therapy, 76*, 1-12.

Westra, H. A., & Dozois, D. J. (2006). Preparing clients for cognitive behavioral therapy: A randomized pilot study of motivational interviewing for anxiety. *Cognitive therapy and research, 30*(4), 481-498.

Wheatcroft, R., & Creswell, C. (2007). Parents' cognitions and expectations about their pre-school children: The contribution of parental anxiety and child anxiety. *British Journal of Developmental Psychology*, *25*(3), 435–441.

Whiteside, S. P. H., Gryczkowski, M., Ale, C. M., Brown-Jacobsen, A. M., & McCarthy, D. M. (2013). Development of child- and parent-report measures of behavioral avoidance related to childhood anxiety disorders. *Behavior Therapy*, *44*(2), 325-337.

Whiteside, S. P. H., Sim, L. A., Morrow, A. S., Farah, W. H., Hilliker, D. R., Murad, M. H., & Wang, Z. (2020). A meta-analysis to guide the enhancement of CBT for childhood anxiety: Exposure over anxiety management. *Clinical Child and Family Psychology Review*, *23*(1), 102–121.

Zhou, S., Creswell, C., Spence, S. H., & Reardon, T. (2024). Measurement invariance of the higher-order model of Preschool Anxiety Scale (PAS) across child age, gender, parental anxiety, and pandemic period in England. *Psychological Assessment, 36*(9), 526–537.

Zhou, X., Zhang, Y., Furukawa, T. A., Cuijpers, P., Pu, J., Weisz, J. R., Yang, L., Hetrick, S. E., Del Giovane, C., Cohen, D., James, A. C., Yuan, S., Whittington, C., Jiang, X., Teng, T., Cipriani, A., & Xie, P. (2019). Different types and acceptability of psychotherapies for acute anxiety disorders in children and adolescents: A network meta-analysis. *JAMA Psychiatry (Chicago, Ill.)*, *76*(1), 41-50.

Appendices

Appendix 1: Supplementary Documents of the Meta-analytic Review in Chapter 2

1.1 Search strings of the review

Search Strings for Cochrane Central Register of Controlled Trials (CENTRAL)

Search aim	ID	Search Hits
Anxiety disorders	#1	(anx* or panic* or phobi* or fear* or worr* or agoraphobi* or "internali?ing problem*" or "internali?ing disorder*" or "shy*" or GAD or mute or mutes or mutism or "school refusal"):ti,ab,kw
CBT interventions	#2	("cognitive behavioral therap*" or "cognitive behavioural therap*" or "cognitive*" or "behavio*" or CBT* or CBGT*or bCBT or b-CBT or GPDCBT or GPD-CBT or E-CBT or ECBT or T-CBT to TCBT or F-CBT or FCBT or CCBT or C-CBT):ti,ab,kw
	#3	(overcom* or control* or reduc* or prevent* or treat* or interve* or combat* or train* or educat* or programme* or project* or manag* or support* or car* or therap* or psychotherap* or counsel* or course* or lesson* o technique* or restructur* or defusion or skill* or manag* or help* or instruct* or coach* or psychoeducat* or psycho-educat*):ti,ab,kw
	#4	("confidence building" or "emotion identi*" or exposure* or relaxation or "self talk" or "mindfulness" or "role play*" or "rumination" or "problem solving*" or reinforc* or "role play" or "role playing" or schema* or self-control* or "self control" or "self controlling"):ti,ab,kw
	#5	#2 or #3 or #4
Children and Adolescents	#6	(infant* or child* or toddler* or boy* or girl* or kids or juvenil* or minors or paediatric* or pediatric* or adolesc* or preadolesc* or pre-adolesc* or pubert* or pubescen* or prepube* or pre-pube* or teen* or young* or youth* or schoo* or preschool* or pre-school* or nurser* or kindergarten):ti,ab,kw,so
CBT for child & adolescent anxiety disorders	#7	#1 and #5 and #6
	#8	((OCD or "obsessive compulsive" or PTSD or "posttraumatic stress" or "post-traumatic stress") not (anx* or panic* or phobi* or fear* or worr* or agoraphobi* or "internali?ing

Exclude interventions specifically for obsessive compulsive disorders (OCD) or post-traumatic stress disorder (PTSD)		problem*" or internali?ing disorder*" or "shy* or GAD or mute or mutes or mutism or "school refusal")):ti
	#9	#7 not #8

Search Strings for Ovid MEDLINE, Ovid Embase, Ovid PsycINFO

Search aim	ID	Search Hits
RCTs	#1	controlled clinical trial.pt.
	#2	randomised controlled trial.pt
	#3	randomi#ed or randomi#ation or randomi#ing).ti,ab,kf
	#4	(RCT or "at random" or (random* adj3 (administ* or allocat* or assign* or class* or cluster or control* or determine* or divide* or division or distribut* or expose* or fashion or number* or place* or pragmatic or quasi or recruit* or split or subsitut* or prevent* or treat*))).ti,ab,kf.
	#5	trial.ab,ti,kf.
	#6	((control* or group* or compar*) adj5 (waitlist* or wait* list* or waiting or WLC)).ab.
	#7	((control* or group* or compar*) adj5 no* adj2 (active* or interven* or treat* or prevent*)).ab.
	#8	or/1-7
Anxiety disorders	#9	(anx* or panic* or phobi* or fear* or worr* or agoraphobi* or "internali?ing problem*" or "internali?ing disorder*" or "shy*" or GAD or mute or mutes or mutism or "school refusal"):ti,ab,kf
CBT interventions	#10	("cognitive behavioral therap*" or "cognitive behavioural therap*" or "cognitive*" or "behavio*" or CBT* or CBGT*or bCBT or b-CBT or GPDCBT or GPD-CBT or E-CBT or ECBT or T-CBT to TCBT or F-CBT or FCBT or CCBT or C-CBT):ti,ab,kf
	#11	(overcom* or control* or reduc* or prevent* or treat* or interve* or combat* or train* or educat* or programme* or project* or manag* or support* or car* or therap* or psychotherap* or counsel* or course* or lesson* o technique* or restructur* or defusion or skill* or manag* or help* or instruct* or coach* or psychoeducat* or psycho-educat*):ti,ab,kf
	#12	("confidence building" or "emotion identi*" or exposure* or relaxation or "self talk" or "mindfulness" or "role play*" or "rumination" or "problem solving*" or reinforc* or "role

		play" or "role playing" or schema* or self-control* or "self control" or "self controlling"):ti,ab,kf
	#13	or/10-12
Children and Adolescents	#14	(infant* or child* or toddler* or boy* or girl* or kids or juvenil* or minors or paediatric* or pediatric* or adolesc* or preadolesc* or pre-adolesc* or pubert* or pubescen* or prepube* or pre-pube* or teen* or young* or youth* or schoo* or preschool* or pre-school* or nurser* or kindergarten):ti,ab,kf
RCTs of CBT for child & adolescent anxiety disorders	#15	8 and 9 and 13 and 14
Exclude interventions specifically for obsessive compulsive disorders (OCD) or post-traumatic stress disorder (PTSD)	#16	((OCD or "obsessive compulsive" or PTSD or "posttraumatic stress" or "post-traumatic stress") not (anx* or panic* or phobi* or fear* or worr* or agoraphobi* or "internali?ing problem*" or internali?ing disorder*" or "shy* or GAD or mute or mutes or mutism or "school refusal")):ti
	#17	15 ot 16

1.2 A list of all trials included in the review

Ahlen, J., Hursti, T., Tanner, L., Tokay, Z., & Ghaderi, A. (2018). Prevention of anxiety and depression in Swedish school children: A cluster-randomized effectiveness study. *Prevention Science, 19*(2), 147-158.

Anticich, S. A. J., Barrett, P. M., Silverman, W., Lacherez, P., & Gillies, R. (2013). The prevention of childhood anxiety and promotion of resilience among preschool-aged children: A universal school-based trial. *Advances in School Mental Health Promotion, 6*(2), 93-121

Arendt, K., Thastum, M., & Hougaard, E. (2016). Efficacy of a Danish version of the Cool Kids programme: A randomized wait-list controlled trial. *Acta Psychiatrica Scandinavica, 133*(2), 109-121.

Attwood, M., Meadows, S., Stallard, P., & Richardson, T. (2012). Universal and targeted computerised cognitive behavioural therapy (Think, Feel, Do) for emotional health in schools: Results from two exploratory studies. *Child and Adolescent Mental Health, 17*(3), 173-178.

Balle, M., & Tortella-Feliu, M. (2010). Efficacy of a brief school-based programme for selective prevention of childhood anxiety. *Anxiety, Stress, and Coping, 23*(1), 71-85.

Barrett, P. M., & Turner, C. (2001). Prevention of anxiety symptoms in primary school children: Preliminary results from a universal school-based trial. *British Journal of Clinical Psychology, 40*(4), 399-410.

Barrett, P. M., Dadds, M. R., & Rapee, R. M. (1996). Family treatment of childhood snxiety. *Journal of Consulting and Clinical Psychology, 64*(2), 333-342.

Barrett, P. M., Sonderegger, R., & Sonderegger, N. L. (2001). Evaluation of an anxiety-prevention and positive-coping programme (FRIENDS) for children and adolescents of non-English-speaking background. *Behaviour Change, 18*(2), 78-91.

Barrett, P. M., Sonderegger, R., & Xenos, S. (2003). Using Friends to combat anxiety and adjustment problems among young migrants to Australia: A national trial. *Clinical Child Psychology and Psychiatry, 8*(2), 241-260.

Berry, K., & Hunt, C. J. (2009). Evaluation of an intervention programme for anxious adolescent boys who are bullied at school. *Journal of Adolescent Health, 45*(4), 376-382.

Bornas, X., De la Torre-Luque, A., Fiol-Veny, A, & Balle, M. (2017). Trajectories of anxiety symptoms in adolescents: Testing the model of emotional inertia. *International Journal of Clinical and Health Psychology, 17*(2), 192-196.

Bouchard, S., Gervais, J., Gagnier, N., & Loranger, C. (2013). Evaluation of a primary prevention programme for anxiety disorders using story books with children aged 9–12 years. *The Journal of Primary Prevention, 34*(5), 345-358.

Brown, J. S.L., Blackshaw, E., Stahl, D., Fennelly, L., McKeague, L., Sclare, I., & Michelson, l. (2019). School-based early intervention for anxiety and depression in older adolescents: A feasibility randomised controlled trial of a self-referral stress management workshop programme ("DISCOVER"). *Journal of Adolescence (London, England.), 71*(1), 150-161.

Cartwright-Hatton, S., McNally, D., Field, A. P., Rust, S., Laskey, B., Dixon, C.. . . Woodham, A. (2011). A New Parenting-based group intervention for young anxious children: Results of a randomized controlled trial. *Journal of the American Academy of Child and Adolescent Psychiatry, 50*(3), 242-251.

Clancy, A., O'Connor, M., Murphy, E., Connaughton, L., & O'Reilly, G. (2024). Effectiveness of a universal school-based intervention for reducing internalizing problems in irish primary school children: A cluster randomized control trial. *School Psychology International, 45*(5), 495–521.

Cobham, V. E. (2012). Do anxiety-disordered children need to come into the clinic for efficacious treatment? *Journal of Consulting and Clinical Psychology, 80*(3), 465-476.

Cobham, V. E., Filus, A., & Sanders, M. R. (2017). Working with parents to treat anxiety-disordered children: A proof of concept RCT evaluating Fear-less Triple P. *Behaviour Research and Therapy, 95*, 128-138.

Cooley-Strickland, M. R., Griffin, R. S., Darney, D., Otte, K., & Ko, J. (2011). Urban African American youth exposed to community violence: A school-based anxiety preventive intervention efficacy study. *Journal of Prevention & Intervention in the Community, 39*(2), 149-166.

Dadds, M. R., Spence, S. H., Holland, D. E., Barrett, P. M., & Laurens, K. R. (1997). Prevention and early intervention for anxiety disorders: A controlled trial. *Journal of Consulting and Clinical Psychology, 65*(4), 627–635.

Diego, S., Morales, A., & Orgilés, M. (2024). Treating Emotional Disorders in Spanish Children: A Controlled Randomized Trial in a Clinical Setting. *Behavior Therapy, 55*(2), 292–305.

Donovan, C. L., & March, S. (2014). Online CBT for preschool anxiety disorders: A randomised control trial. *Behaviour Research and Therapy, 58*, 24-35.

Doyle, F. L., Dodd, H. F., Morris, T. M., Lazarus, R. S., Byrow, Y., & Hudson, J. L. (2021). Targeting risk factors for inhibited preschool children: An anxiety prevention programme. *Behaviour Research and Therapy, 147*, 103982.

Essau, C. A, Conradt, J., Sasagawa, S., & Ollendick, T. H. (2011). Prevention of anxiety symptoms in children: Results from a universal school-based trial. *Behavior Therapy, 43*(2), 450-464.

Fernández-Martínez, I., Morales, A., Espada, J. P., Essau, C. A., & Orgilés, M. (2019). Effectiveness of the programme super skills for life in reducing symptoms of anxiety and depression in young Spanish children. *Psicothema, 31*(3), 298-304.

Flannery-Schroeder, E. C., & Kendall, P. C. (2000). Group and individual cognitive-behavioral treatments for youth with anxiety disorders: A randomized clinical trial. *Cognitive Therapy and Research, 24*(3), 251-278.

Gaesser, A. H., & Karan, O. C. (2017). A randomized controlled comparison of emotional freedom technique and cognitive-behavioral therapy to reduce adolescent anxiety: A pilot study. *The Journal of Alternative and Complementary Medicine (New York, N.Y.), 23*(2), 102-108.

Gallegos, J., Linan-Thompson, S., Stark, K., & Ruvalcaba, N. (2013). Preventing childhood anxiety and depression: Testing the effectiveness of a school-based programme in Mexico. *Psicología Educativa (Madrid), 19*(1), 37-44.

Gillham, J. E., Reivich, K. J., Brunwasser, S. M., Freres, D. R., Chajon, N. D., Kash-MacDonald, V. M., . . . Seligman, M. E.P. (2012). Evaluation of a group cognitive-behavioral depression prevention programme for young adolescents: A randomized effectiveness trial. *Journal of Clinical Child and Adolescent Psychology, 41*(5), 621-639.

Gillham, J. E., Reivich, K. J., Freres, D. R., Lascher, M., Litzinger, S., Shatté, A., & Seligman, M. E. P. (2006). School-based prevention of depression and anxiety symptoms in early adolescence: A pilot of a parent intervention component. *School Psychology Quarterly, 21*(3), 323-348.

Ginsburg, G. S, Drake, K. L, Tein, J., Teetsel, R., & Riddle, M. A. (2015). Preventing onset of anxiety disorders in offspring of anxious parents: A randomized controlled trial of a family-based intervention. *The American Journal of Psychiatry, 172*(12), 1207-1214.

Ginsburg, G. S. (2009). The child anxiety prevention study: Intervention model and primary outcomes. *Journal of Consulting and Clinical Psychology, 77*(3), 580-587.

Hancock, K. M., Swain, J., Hainsworth, C. J., Dixon, A. L., Koo, S., & Munro, K. (2018). Acceptance and commitment therapy versus cognitive behavior therapy for children with anxiety: Outcomes of a randomized controlled trial. *Journal of Clinical Child and Adolescent Psychology, 47*(2), 296-311.

Huang, W., Wu, P., Li, J., Zhou, Y., Xiong, Z., Su, P., Wan, Y., Tao, F., & Sun, Y. (2025). Effectiveness of a universal resilience-focused intervention for children in the school setting: A randomized controlled trial. *Journal of Affective Disorders, 368*, 695–703.

Ijaz, S., Rohail, I., & Irfan, S. (2024). School-based intervention for anxiety using group cognitive behavior therapy in Pakistan: a feasibility randomized controlled trial. *Psicologia, Reflexão e Crítica, 37*(1), 31–10.

Ishikawa, S., Kikuta, K., Sakai, M., Mitamura, T., Motomura, N., & Hudson, J. L. (2019). A randomized controlled trial of a bidirectional cultural adaptation of cognitive behavior therapy for children and adolescents with anxiety disorders. *Behaviour Research and Therapy, 120,* 103432.

Javadi, V., Ahmadi, F., Ebrahimi, L. S., Dadashi, M., & Mousavi, S. E. (2024). Internet-based UP-A intervention on treatment of stress, anxiety, depression, and psychological flexibility among adolescents with sub-clinical diagnosis of emotional disorders during the COVID-19 pandemic: a clinical trial. *BMC Psychology, 12*(1), 526–529.

Kendall, P. C, Flannery-Schroeder, E., Panichelli-Mindel, S. M, Southam-Gerow, M., Henin, A., & Warman, M. (1997). Therapy for youths with anxiety disorders: a second RCT. *Journal of Consulting and Clinical Psychology, 65*(3), 366-380.

Kendall, P. C. (1994). Treating anxiety disorders in children. *Journal of Consulting and Clinical Psychology, 62*(1), 100-110.

Kendall, P. C. & Barrett. P. (2010). Preventing anxiety and promoting social and emotional strength in preschool fhildren: A universal evaluation of the Fun FRIENDS programme. *Advances in School Mental Health Promotion, 3*(3). 14-25.

Kennedy, S. J., Rapee, R. M., & Edwards, S. L. (2009). A selective intervention programme for inhibited preschool-aged children of parents with an anxiety disorder: Effects on

current anxiety disorders and temperament. *Journal of the American Academy of Child and Adolescent Psychiatry, 48*(6), 602-609.

Kozina, A. (2020). School-based prevention of anxiety using the "My FRIENDS" emotional resilience programme: Six-month follow-up. *International Journal of Psychology, 55*(S1), 70-77.

Lau, W., Chan, C. K., Li, J. C., & Au, T. K. (2010). Effectiveness of group cognitive-behavioral treatment for childhood anxiety in community clinics. *Behaviour Research and Therapy, 48*(11), 1067-1077.

Lowe, C., & Wuthrich, V. M. (2021). Randomised controlled trial of study without stress: A cognitive behavioural therapy programme to reduce stress in students in the final year of high school. *Child Psychiatry and Human Development, 52*(2), 205-216.

Lowry-Webster, H. M., Barrett, P. M., & Dadds, M. R. (2001). A universal prevention trial of anxiety and depressive symptomatology in childhood: Preliminary data from an Australian study. *Behaviour Change, 18*(1), 36-50.

Lupu.V & Iftene. F (2009) The impact of rational emotive behaviour education on anxiety in teenagers. *Journal of Cognitive and Behavioral Psychotherapies, 9*(1), 95-105

Lyneham, H. J., & Rapee, R. M. (2006). Evaluation of therapist-supported parent-implemented CBT for anxiety disorders in rural children. *Behaviour Research and Therapy, 44*(9), 1287-1300.

March, S., Spence, S. H., & Donovan, C. L. (2009). The efficacy of an internet-based cognitive-behavioral therapy intervention for child anxiety disorders. *Journal of Pediatric Psychology, 34*(5), 474-487.

Martinsen, K. D., Rasmussen, L. M. P., Wentzel-Larsen, T., Holen, S., Sund, A. Mari., Løvaas, M. E. S., . . . Neumer, S. P. (2019). Prevention of anxiety and depression in school children: Effectiveness of the transdiagnostic EMOTION programme. *Journal of Consulting and Clinical Psychology, 87*(2), 212-219.

McLellan, L. F., Woon, S., Hudson, J. L., Lyneham, H. J., Karin, E., & Rapee, R. M. (2024). Treating child anxiety using family-based internet delivered cognitive behavior therapy with brief therapist guidance: A randomized controlled trial. *Journal of Anxiety Disorders, 101,* 102802.

McLoone, J. K., & Rapee, R. M. (2012). Comparison of an anxiety management programme for children implemented at home and school: Lessons learned. *School Mental Health, 4*(4), 231-242.

Mifsud, C., & Rapee, R. M. (2005). Early intervention for childhood anxiety in a school setting: Outcomes for an economically disadvantaged population. *Journal of the American Academy of Child and Adolescent Psychiatry, 44*(10), 996-1004.

Miller, L. D., Laye-Gindhu, A., Bennett, J. L., Liu, Y., Gold, S., March, J. S., . . . Waechtler, V. E. (2011). An effectiveness study of a culturally enriched school-based CBT anxiety prevention programme. *Journal of Clinical Child and Adolescent Psychology, 40*(4), 618-629.

Miller, L. D., Short, C., Garland, E. J., & Clark, S. (2010). The ABCs of CBT (Cognitive Behavior Therapy): Evidence-based approaches to child anxiety in public school settings. *Journal of Counseling and Development, 88*(4), 432-439.

Mohammadi, A., Soleimani, M., Mohammadi, M. R., Abasi, I., & Foroughi, A. A. (2019). Unified protocol for transdiagnostic prevention of depression and anxiety in Iranian adolescents: Protocol development and initial outcome data. *Iranian Journal of Psychiatry, 14*(2), 171-178.

Moharreri, F., & Heydari Yazdi, A. S. (2017). Evaluation of the effectiveness of the Friends for Life programme on children's anxiety and depression. *Iranian Journal of Psychiatry, 12*(4), 272-280.

Morgan, A. J., Rapee, R. M., Salim, A., Goharpey, N., Tamir, E., McLellan, L. F., & Bayer, J. K. (2017). Internet-Delivered parenting programme for prevention and early intervention of anxiety problems in young children: Randomized controlled trial. *Journal of the American Academy of Child and Adolescent Psychiatry, 56*(5), 417-425.

Muris, P., Meesters, C., & Van Melick, M. (2002). Treatment of childhood anxiety disorders: A preliminary comparison between cognitive-behavioral group therapy and a psychological placebo intervention. *Journal of Behavior Therapy and Experimental Psychiatry, 33*(3), 143-158.

Omkarappa, D. B., Rentala, S., & Nattala, P. (2021). Psychiatric nurse delivered group-cognitive-behavioral therapy for internalizing behavior problems among children of parents with alcohol use disorders. *Journal of Child and Adolescent Psychiatric Nursing, 34*(4), 259-267.

Pereira, A. I., Marques, T., Russo, V., Barros, L., & Barrett, P. M. (2014). Effectiveness of the FRIENDS for Life programme in Portuguese schools: Study with a sample of highly anxious children. *Psychology in the Schools, 51*(6), 647-657.

Ramdhonee-Dowlot, K., Balloo, K., & Essau, C. A. (2021). Effectiveness of the Super Skills for Life programme in enhancing the emotional wellbeing of children and adolescents in residential care institutions in a low- and middle-income country: A randomised waitlist-controlled trial. *Journal of Affective Disorders, 278*, 327-338.

Rapee, R. M, Abbott, M. J, & Lyneham, H. J. (2006). Bibliotherapy for children with anxiety disorders using written materials for parents. Journal of Consulting and Clinical Psychology, 74(3), 436-444.

Rapee, R. M. (2000). Group treatment of children with anxiety disorders: Outcome and predictors of treatment response. *Australian Journal of Psychology, 52*(3), 125-129.

Rasing, S. P. A., Creemers, D. H. M., Vermulst, A.A., Janssens, J. M. A. M., Engels, R. C. M. E., & Scholte, R. H. J. (2018). Outcomes of a randomized controlled trial on the effectiveness of depression and anxiety prevention for adolescents with a high familial risk. *International Journal of Environmental Research and Public Health, 15*(7), 1457.

Rivero, L. M. H. N., Andrade, A. L. M., Figueredo, L. Z. P., Pinheiro, B. O., Micheli, D. (2020). Evaluation of FunFRIENDS programme in prevention of anxiety in Brazilian children: A randomized controlled pilot trial. *Ciência & Saude Coletiva, 25*(11), 4497-4508.

Rodgers, A., & Dunsmuir, S. (2015). A controlled evaluation of the 'FRIENDS for Life' emotional resiliency programme on overall anxiety levels, anxiety subtype levels and school adjustment. *Child and Adolescent Mental Health, 20*(1), 13-19.

Rooney, R., Hassan, S., Kane, R., Roberts, C. M., & Nesa, M. (2013). Reducing depression in 9–10-year-old children in low SES schools: A longitudinal universal randomized controlled trial. *Behaviour Research and Therapy, 51*(12), 845-854.

Ruttledge. R., Devitt, B. D., Greene, G. Mullany, M., Charles, E., Frehill. J. & Moriarty. M. (2016). A randomised controlled trial of the FRIENDS for Life emotional resilience programme delivered by teachers in Irish primary schools. *Educational & Child Psychology, 33*(2), 69-89

Sanders, S., Lane, J. J., Losinski, M., Nelson, J., Asiri, A., Holloway, S. M. K., & Rogers, E. (2018). An implementation of a computerized cognitive behavioral treatment programme to address student mental health needs. *Professional School Counseling, 22*(1), 1-9.

Shortt, A. L., Barrett, P. M., & Fox, T. L. (2001). Evaluating the FRIENDS programme: A cognitive-behavioral group treatment for anxious children and their parents. *Journal of Clinical Child and Adolescent Psychology, 30*(4), 525-535.

Silverman, W. K., Kurtines, W. M., Ginsburg, G. S., Weems, C. F., Lumpkin, P. White., & Carmichael, D. H. (1999). Treating anxiety disorders in children with group cognitive-behaviorial therapy. *Journal of Consulting and Clinical Psychology, 67*(6), 995-1003.

Siu, A. F. Y. (2007). Using friends to combat internalizing problems among primary school children in Hong Kong. *Journal of Cognitive and Behavioral Psychotherapies, 7*(1), 11-26.

Skarphedinsson, G., & Karlsson, G. K. (2023). The feasibility and efficacy of a group-based, brief transdiagnostic cognitive-behavioral treatment for adolescents with internalizing problems. Child Psychiatry and Human Development. https://doi.org/10.1007/s10578-023-01552-7.

Smith, A. M., Flannery-Schroeder, E. C., Gorman, K. S., & Cook, N. (2014). Parent cognitive-behavioral intervention for the treatment of childhood anxiety disorders: A pilot study. *Behaviour Research and Therapy, 61*, 156-161.

Spence, S. H., Donovan, C. L., March, S., Gamble, A., Anderson, R. E., Prosser, S., & Kenardy, J. (2011). A randomized controlled trial of online versus clinic-based CBT for adolescent anxiety. *Journal of Consulting and Clinical Psychology, 79*(5), 629-642.

Spence, S. H., Holmes, J. M., March, S., & Lipp, O. V. (2006). The feasibility and outcome of clinic plus internet delivery of cognitive-behavior therapy for childhood anxiety. *Journal of Consulting and Clinical Psychology, 74*(3), 614-621.

Starrenburg, M. L.A., van, Kuijpers, R. C. W. M., Kleinjan, M., Hutschemaekers, G. J. M., & Engels, R. C. M. E. (2017). Effectiveness of a cognitive behavioral therapy-based indicated prevention programme for children with elevated anxiety levels: A randomized controlled trial. *Prevention Science, 18*(1), 31-39.

Stjerneklar, S., Hougaard, E., McLellan, L. F, & Thastum, M. (2019). A randomized controlled trial examining the efficacy of an internet-based cognitive behavioral therapy programme for adolescents with anxiety disorders. *PloS One, 14*(9), E0222485.

Swain, J., Hancock, K., Hainsworth, C., & Bowman, J. (2015). Mechanisms of change: Exploratory outcomes from a randomised controlled trial of acceptance and

commitment therapy for anxious adolescents. *Journal of Contextual Behavioral Science, 4*(1), 56-67.

Thirlwall, K., Cooper, P. J., Karalus, J., Voysey, M., Willetts, L., & Creswell, C. (2013). Treatment of child anxiety disorders via guided parent-delivered cognitive–behavioural therapy: Randomised controlled trial. *British Journal of Psychiatry, 203*(6), 436-444.

Tien, H.-L. S., Su, Y.-N., Zhang, A., Kaichi, I., Koshiba, T., Okawa, S., Urao, Y., & Shimizu, E. (2023). The effects of a Journey of the Brave Counseling Programme on anxiety, well-being, and life adjustment in Taiwanese children. *BMC Psychiatry*, *23*(1), 657.

Vigerland, S., Ljótsson, B., Thulin, U., Öst, L. G., Andersson, G. & Serlachius, E. (2016). Internet-delivered cognitive behavioural therapy for children with anxiety disorders: A randomised controlled trial. *Behaviour Research and Therapy, 76*, 47-56.

Villabø, M. A., Narayanan, M., Compton, S. N., Kendall, P. C., & Neumer, S. P. (2018). Cognitive-behavioral therapy for youth anxiety: An effectiveness evaluation in community practice. *Journal of Consulting and Clinical Psychology, 86*(9), 751-764.

Walkup, J. T. (2015). Cognitive behavioral therapy, sertraline, or a combination in childhood anxiety. *The New England Journal of Medicine, 368*(5), 490.

Waters, A. M., Groth, T. A., Sanders, M., O'Brien, R., & Zimmer-Gembeck, M. J. (2015). Developing partnerships in the provision of youth mental health services and clinical education: A school-based cognitive behavioral intervention targeting anxiety symptoms in Children. *Behavior Therapy, 46*(6), 844-855.

Wuthrich, V. M., Rapee, R. M., Cunningham, M. J., Lyneham, H. J., Hudson, J. L., & Schniering, C. A. (2012). A randomized controlled trial of the Cool Teens CD-ROM computerized programme for adolescent anxiety. *Journal of the American Academy of Child and Adolescent Psychiatry, 51*(3), 261-270.

Zemestani, M., Ezzati, S., Nasiri, F., Gallagher, M. W., Barlow, D. H., & Kendall, P. C. (2024). A culturally adapted unified protocol for transdiagnostic treatment of anxiety disorders in adolescents (UP-A): a randomized waitlist-controlled trial. *Psychological Medicine, 54*(2), 385–398.

1.3 Sample and intervention characteristics of all included trials

Study	Mean age	Age range	Sample inclusion criteria	Duration without booster session (weeks)	Facilitator contact time (minute)	Parent involvement	Delivery format	Child anxiety symptoms (child report)[1]	Child anxiety symptoms (parent report)[1]	Parent anxiety symptoms[3]
Attwood 2012	10.6	10-12	universal	6	270	child-only	face-to-face individual CBT delivered by mental health professionals	SCAS_C	SCAS_P	
Dadds 1997	9.4	7-14	elevated anxiety symptom	10	1170	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	RCMAS_C	N/A	
Julia 2013	9.89	8-13	universal	10	930	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by school staff	SCAS_C	N/A	
Ginsburg 2015	8.69	6-13	one parent with an anxiety disorder	8	480	child-focus CBT with high parental involvement	face-to-face individual CBT delivered by mental health professionals	SCARED_C	SCARED_P	
Ginsburg 2009	8.94	6-13	one parent with an anxiety disorder	8	480	child-focus CBT with high parental involvement	face-to-face individual CBT delivered by mental health professionals	SCARED_C	SCARED_P	
Kendall 1997	13.18	9-13	anxiety disorder	18	1140	child-focus CBT with limited parental involvement	face-to-face individual CBT delivered by mental health professionals	RCMAS_C/STAIC-T_C	STAIC-T_P	
Waters 2015	9.96	grade 5	universal	8	480	child-only	face-to-face group CBT delivered by mental health professionals	SCAS_C	SCAS_P	

Ahlen 2018	9.6	8-11	universal	10	600	child-only	face-to-face group CBT delivered by school staff	SCAS_C	SCAS_P	
Anticich 2013 (1)	5.3	4-7	universal	10	720	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by school staff	N/A	PAS_P	
Anticich 2013 (2)	5.3	4-7	universal	10	660	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by school staff	N/A	PAS_P	
Arendt 2016	11.78	7-16	anxiety disorder	10	1200	child-focus CBT with high parental involvement	face-to-face group CBT delivered by mental health professionals	SCAS_C	SCAS_P	
Balle 2010	13.63	11-17	high anxiety sensitivity	6	270	child-only	face-to-face group CBT delivered by mental health professionals	SCAS_C	N/A	
Barrett 2001	10.72	10-12	universal	10	1050	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	SCAS_C/RCMAS_C	N/A	
Barrett 2001	10.67	10-12	universal	10	1050	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by school staff	SCAS_C/RCMAS_C	N/A	
Lowry-Webster 2001	missing	10-13	universal	10	975	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by school staff	SCAS_C/RCMAS_C	N/A	
Barrett 1996 (1)	missing	7-14	anxiety disorder	12	840	child-only	face-to-face individual CBT delivered by	RCMAS_C	N/A	

							mental health professionals			
Barrett 1996 (2)	missing	7-14	anxiety disorder	12	840	child-focus CBT with limited parental involvement	face-to-face individual CBT delivered by mental health professionals	RCMAS_C	N/A	
Barrett 2001	missing	7-19*	universal	10	600	child-only	face-to-face group CBT delivered by mental health professionals	RCMAS_C	N/A	
Barrett 2003 (1)	10.25	6-13	universal	10	600	child-only	face-to-face group CBT delivered by mental health professionals	RCMAS_C	N/A	
Barrett 2003 (2)	14.31	11-19	universal	10	600	child-only	face-to-face group CBT delivered by mental health professionals	RCMAS_C	N/A	
Berry 2009	13.04	12-15	elevated anxiety symptom	8	960	child-focus CBT with high parental involvement	face-to-face group CBT delivered by mental health professionals	SCARED_C	SCARED_P	
Bornas 2017	14.65	13-15	universal	8	360	child-only	face-to-face group CBT delivered by mental health professionals	RCADS-A_C	N/A	
Bouchard 2013	10.4	9-12	universal	10	825	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	MASC_C	N/A	
Fernández-Martínez 2019	6.89	6-8	elevated internalizing symptoms	8	360	child-only	face-to-face group CBT delivered by mental health professionals	N/A	SCAS_P	
Ramdhonee-Dowlot 2021	11.75	9-14	universal	8	360	child-only	face-to-face group CBT delivered by mental health professionals	RCADS-A_C	N/A	

Brown 2019	17.3	16-19	universal	1	360	child-only	face-to-face group CBT delivered by mental health professionals	RCADS-A_C	N/A	
Cartwright-Hatton 2011	6.57	2-8	elevated anxiety symptom	10	1200	parent-only	face-to-face group CBT delivered by mental health professionals	MASC_C	SCARED_P	
Cobham 2012 (1)	9.74	7-14	anxiety disorder	12	900	child-focus CBT with high parental involvement	face-to-face individual CBT delivered by mental health professionals	RCMAS_C/SCAS_C	N/A	
Cobham 2012 (2)	10.6	7-14	anxiety disorder	12	240	parent-only	face-to-face+remote CBT	RCMAS_C/SCAS_C	N/A	
Cobham 2017	9.3	7-14	anxiety disorder	6	540	parent-only	face-to-face group CBT delivered by mental health professionals	SCAS_C	SCAS_P	
Cooley-Strickland 2011	9.41	8-12	elevated anxiety symptom	7	840	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	RCMAS_C	N/A	
Essau 2011	10.92	9-12	universal	10	840	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	SCAS_C	N/A	
Flannery-Schroeder 2000 (1)	missing	8-14	elevated anxiety symptom	18	1140	child-focus CBT with limited parental involvement	face-to-face individual CBT delivered by mental health professionals	RCMAS_C/STAIC-T_C	STAIC-T_P	
Flannery-Schroeder 2000 (2)	missing	8-14	elevated anxiety symptom	18	1140	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	RCMAS_C/STAIC-T_C	STAIC-T_P	

Doyle 2021	3.94	3-5	behavioral inhibition	11	540	child-focus CBT with high parental involvement	face-to-face individual CBT delivered by mental health professionals	N/A	PAS_P	
Donovan 2014	4.08	3-6	anxiety disorder	8	20	parent-only	remote CBT	N/A	PAS_P	
Gaesser 2017	missing	10-18	elevated anxiety symptom	missing	20	child-only	face-to-face individual CBT delivered by mental health professionals	RCMAS_C	N/A	
March 2009	9.45	7-12	anxiety disorder	10	60	child-focus CBT with high parental involvement	remote CBT	SCAS_C	SCAS_P	
Hancock 2018	missing	7-17*	anxiety disorder	10	900	child-focus CBT with high parental involvement	face-to-face group CBT delivered by mental health professionals	MASC_C	N/A	
Gillham 2006	missing	Grade 6-7	elevated anxiety symptom	8	1260	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	RCMAS_C	N/A	
Gillham 2012 (1)	missing	Grade 6-8	elevated anxiety symptom	10	900	child-only	face-to-face group CBT delivered by mental health professionals	RCMAS_C	N/A	
Gillham 2012 (2)	missing	Grade 6-8	elevated anxiety symptom	10	1440	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	RCMAS_C	N/A	
Shortt 2001	7.85	6.5-10	anxiety disorder	10	1150	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	RCMAS_C	N/A	

Ishikawa 2019	missing	8-15*	anxiety disorder	8	540	child-only	face-to-face individual CBT delivered by mental health professionals	SCAS_C	SCAS_P	
Rooney 2013	8.75	9-10	universal	10	600	child-only	face-to-face group CBT delivered by school staff	SCAS_C	N/A	
Kendall 1994	missing	9-13	anxiety disorder	16	1020	child-focus CBT with limited parental involvement	face-to-face individual CBT delivered by mental health professionals	RCMAS_C/STAIC-T_C	STAIC-T_P	
Kennedy 2009	3.92	3-5	behavioral inhibition and parent with an anxiety disorder	8	720	parent-only	face-to-face group CBT delivered by mental health professionals	N/A	PAS_P	DASS-A (father and mother)
Kozina 2020	missing	13-14	universal	10	540	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	AN-UD_C	N/A	
Lau 2010	8.56	6-11	elevated anxiety symptom	12	1180	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	SCAS_C	SCAS_P	
Martinsen 2019	10.1	8-12	elevated anxiety symptom	10	1180	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	MASC_C	MASC_P	
Lowe 2021	missing	17-18	universal	8	480	child-only	face-to-face group CBT delivered by school staff	DASSC-A_C	N/A	
Lupu 2009	17.4	Grade 10-12	universal	1	50	child-only	face-to-face group CBT delivered by mental health professionals	STAIC-T_C	N/A	

Lyneham 2006	9.42	6-12	anxiety disorder	12	220.5	parent-only	remote CBT	SCAS_C/RCMAS_C	SCAS_P	
McLoone 2012 (1)	9.72	7-12	elevated anxiety symptom	10	720	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by school staff	SCAS_C	SCAS_P	
McLoone 2012 (2)	9.69	7-12	elevated anxiety symptom	10	120	parent-only	face-to-face+remote CBT	SCAS_C	SCAS_P	
Mifsud 2005	9.5	8-11	elevated anxiety symptom	8	600	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	SCAS_C	SCAS_P	
Miller 2011	9.77	10-12	universal	9	540	child-only	face-to-face group CBT delivered by mental health professionals	MASC_C	N/A	
Miller 2010	9.75	7-12	universal	8	480	child-only	face-to-face group CBT delivered by school staff	MASC_C	N/A	
Mohammadi 2019	12.77	11-18	universal	8	480	child-only	face-to-face group CBT delivered by mental health professionals	RCADS-A_C	RCADS-A_P	
Moharreri 2017	missing	9-10	elevated anxiety symptom	8	600	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	RCMAS_C	N/A	
Muris 2002	10.25	9-12	elevated anxiety symptom	6	360	child-only	face-to-face group CBT delivered by mental health professionals	RCADS-A_C/STAIC-T_C	N/A	
Morgan 2017	4.8	3-5	behavioral inhibition	8	20	parent-only	remote CBT	N/A	PAS_P	
Omkarappa 2021	14.65	12-16	elevated internalizing symptoms	5	480	child-only	face-to-face group CBT delivered by mental health professionals	SCAS_C	N/A	

Pahi 2010	4.56	4-6	universal	9	720	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by school staff	N/A	PAS_P	
Pereira 2014	10.47	9-12	elevated anxiety symptom	12	720	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	SCARED_C	SCARED_P	
Rapee 2000	10.55	7-16	anxiety disorder	12	810	child-focus CBT with high parental involvement	face-to-face group CBT delivered by mental health professionals	RCMAS_C	N/A	BAI (father and mother)
Rapee 2006	9.49	6-12	anxiety disorder	12	1080	child-focus CBT with high parental involvement	face-to-face group CBT delivered by mental health professionals	SCAS_C	SCAS_P	
Rasing 2018	12.87	11-14	elevated anxiety symptom	6	540	child-only	face-to-face group CBT delivered by mental health professionals	SCAS_C	N/A	
Rivero 2020	4.93	4-7	universal	12	1080	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	N/A	PAS_P	
Rodgers 2015	13.18	12-13	universal	10	600	child-only	face-to-face group CBT delivered by mental health professionals	SCAS_C	SCAS_P	
Ruttledge 2016	10.83	9-13	universal	10	720	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by school staff	SCAS_C	SCAS_P	
Sanders 2019	8.8	7-9	elevated internalizing symptoms	4	180	child-only	face-to-face individual CBT delivered by	BAIC_C	N/A	

							mental health professionals			
Silverman 1999	9.96	6-16	anxiety disorder	12	1140	child-focus CBT with high parental involvement	face-to-face group CBT delivered by mental health professionals	RCMAS_C	RCMAS_P	
Siu 2007	8.4	7-10	elevated internalizing symptoms	8	720	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	SCARED_C	N/A	
Smith 2014	9.8	7-13	anxiety disorder	10	600	parent-only	face-to-face individual CBT delivered by mental health professionals	MASC_C	MASC_P	AMAS (father or mother)
Wuthrich 2012	15.17	14-17	anxiety disorder	12	174	child-focus CBT with limited parental involvement	remote CBT	SCAS_C	SCAS_P	
Villabø 2018 (1)	10.45	7-13	anxiety disorder	12	840	child-focus CBT with limited parental involvement	face-to-face individual CBT delivered by mental health professionals	MASC_C	MASC_P	
Villabø 2018 (2)	10.4	7-13	anxiety disorder	12	840	child-focus CBT with limited parental involvement	face-to-face individual CBT delivered by mental health professionals and group	MASC_C	MASC_P	
Vigerland 2016	10.1	8-12	anxiety disorder	10	80	parent-only	remote CBT	SCAS_C	SCAS_P	
Starrenburg 2017	9.46	7-13	elevated anxiety symptom	12	720	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	SCAS_C	SCAS_P	

Thirlwall 2013	missing	7-12	anxiety disorder	8	320	parent-only	face-to-face+remote CBT	SCAS_C	SCAS_P	
Thirlwall 2013	missing	7-12	anxiety disorder	8	160	parent-only	face-to-face+remote CBT	SCAS_C	SCAS_P	
Stjerneklar 2019	15.03	13-17	anxiety disorder	14	300	child-focus CBT with limited parental involvement	remote CBT	SCAS_C	SCAS_P	
Swain 2015	13.8	12-17	anxiety disorder	10	900	child-only	face-to-face group CBT delivered by mental health professionals	MASC_C	MASC_P	
Spence 2011 (1)	13.98	12-18	anxiety disorder	10	30	child-only	remote CBT	SCAS_C	SCAS_P	
Spence 2011 (2)	13.98	12-18	anxiety disorder	10	900	child-focus CBT with limited parental involvement	face-to-face individual CBT delivered by mental health professionals	SCAS_C	SCAS_P	
Spence 2006 (1)	9.97	7-14	anxiety disorder	10	960	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	SCAS_C/RCMAS_C	SCAS_P	
Spence 2006 (2)	9.79	7-14	anxiety disorder	10	480	child-focus CBT with limited parental involvement	face-to-face group CBT delivered by mental health professionals	SCAS_C/RCMAS_C	SCAS_P	
Walkup 2008	missing	7-17*	anxiety disorder	14	960	child-focus CBT with limited parental involvement	face-to-face individual CBT delivered by mental health professionals	MASC_C/SCARED_C	MASC_P	

Tien 2023	missing	11-12	universal	10	400	child-only	face-to-face group CBT delivered by mental health professionals	SCAS_C	N/A	
Skarphedinsson 2023	14.8	13-17	elevated internalizing symptoms	8	880	child-focus with limited parent involvement	face-to-face group CBT delivered by mental health professionals	RCADS-A_C	RCADS-A_P	
McLellan 2024	9.14	7-12	anxiety disorder	10	150	parent-only	remote CBT	SCAS_C	SCAS_P	
Clancy 2024	11.1	10-12	universal	10	400	child-only	face-to-face group CBT delivered by school staff	RCADS-A_C	N/A	
Diego 2024	10.07	8-12	anxiety disorder and/or depressive disorder	8	480	child-only	face-to-face group CBT delivered by mental health professionals	SCAS_C	SCAS_P	
Huang 2025	9.93	8-12	universal	14	560	child-only	face-to-face group CBT delivered by mental health professionals	HBQ-C, anxiety symptom		
Ijaz 2024	15	14-18	elevated anxiety symptom	8	400	child-only	face-to-face group CBT delivered by mental health professionals	BAIC_C		
Javadi 2024	14.4	12-17	elevated emotional problems	8	675	child-focus with limited parent involvement	remote CBT	DASSC-A_C		
Zemestani 2024	16.1	15-17	anxiety disorder	9	540	child-only	face-to-face group CBT delivered by mental health professionals	YAM-5-part1		

Note. 1. Measures of child anxiety symptoms: SCAS_C/P=Spence Children's Anxiety Scale_child/parent report; RCMAS_C/P=Revised Children's Manifest Anxiety Scale_child/parent report; MASC_C/P=Multidimensional Anxiety Scale for Children_child/parent report; RCADS-A_C/P=Revised Child Anxiety and Depression Scale-Anxiety Subscale_child/parent report; STAIC-T_C/P=State-Trait Anxiety Scale for Children-Trait Anxiety subscale_child/parent report; SCARED_C/P=Screen for Child Anxiety Related Disorders_child/parent report; DASSC-A_C=Depression Anxiety Stress Scale for children-Anxiety subscale_child report; BAIC_C=Beck anxiety inventory for children_child report; PAS_P=Preschool Anxiety Scale_parent report; AN-UD_C=The LAOM Multidimensional Anxiety Scale for children and adolescents_child report; HBQ-C, anxiety symptom=MacArthur Health & Behavior Questionnaire for Late Childhood and Adolescence; YAM-5-part1=Youth Anxiety Measure for DSM-5.

2. Measures of parent anxiety: DASS-A=Depression Anxiety Stress Scale-Anxiety subscale (adult version); BAI=Beck anxiety inventory (adult version); AMAS=Adult Manifest Anxiety Scale.

1.4 Risk of bias of each comparison between CBT and non-active control

Study	Randomisation process	Deviations from intended intervention	Missing outcome data	Measurement of the outcome	Selection of the reported results
Megan 2012	Some concerns	Some concerns	Low risk	High risk	Low risk
Dadds 1997	Some concerns	Some concerns	Low risk	High risk	Low risk
Julia 2013	Some concerns	Low risk	Low risk	High risk	Low risk
Ginsburg 2015	Low risk	Low risk	High risk	High risk	Low risk
Ginsburg 2009	Some concerns	Some concerns	Some concerns	High risk	Low risk
Kendall 1997	High risk	Some concerns	Some concerns	High risk	Low risk
Waters 2015	Low risk	Low risk	Low risk	High risk	Low risk
Ahlen 2018	Low risk	Some concerns	Some concerns	High risk	Low risk
Sarah 2013(1)	Some concerns	Some concerns	Low risk	High risk	Low risk
Sarah 2013b(2)	Some concerns	Some concerns	Low risk	High risk	Low risk
Arendt 2016	Low risk	Some concerns	Low risk	High risk	Low risk
Balle 2010	Some concerns	Some concerns	Some concerns	High risk	Low risk
Barrett 2001(1)	Some concerns	Low risk	High risk	High risk	Low risk
Barrett 2001(2)	Some concerns	Low risk	High risk	High risk	Low risk
Low riskry-Webster 2001	High risk	Low risk	Low risk	High risk	Low risk
Barrett 1996(1)	Some concerns	Some concerns	Low risk	High risk	Low risk
Barrett 1996(2)	Some concerns	Some concerns	Low risk	High risk	Low risk

Barrett 2001	Some concerns	High risk	High risk	High risk	Low risk
Barrett 2003(1)	Some concerns	High risk	High risk	High risk	Low risk
Barrett 2003(2)	Some concerns	High risk	High risk	High risk	Low risk
Berry 2009	Low risk	Some concerns	Low risk	High risk	Low risk
Bornas 2017	Some concerns	High risk	High risk	High risk	Low risk
Bouchard 2013	Some concerns	Some concerns	Some concerns	High risk	Low risk
Fernández-Martínez 2019	Some concerns	Some concerns	Some concerns	High risk	Low risk
Ramdhonee-Dowlot 2021	Some concerns	Low risk	Low risk	High risk	Low risk
Brown 2019	Some concerns	Some concerns	Some concerns	High risk	Low risk
Cartwright-Hatton 2011	Low risk	Low risk	High risk	High risk	Low risk
Cobham 2012(1)	Some concerns	Low risk	Low risk	High risk	Low risk
Cobham 2012(2)	Some concerns	Low risk	Low risk	High risk	Low risk
Cobham 2017	Low risk	Low risk	Low risk	High risk	Low risk
Cooley-Strickland 2011	Some concerns	Some concerns	High risk	High risk	Low risk
Essau 2011	Some concerns	High risk	High risk	High risk	Low risk
Flannery-Schroeder 2000(1)	Some concerns	High risk	High risk	High risk	Low risk
Flannery-Schroeder 2000(2)	Some concerns	High risk	High risk	High risk	Low risk
Doyle 2021	Some concerns	Some concerns	Low risk	High risk	Low risk
Donovan 2014	Low risk	Some concerns	High risk	High risk	Low risk
Gaesser 2017	Low risk	Some concerns	Low risk	High risk	Low risk

March 2009	Low risk	Some concerns	Low risk	High risk	Low risk
Hancock 2018	Low risk	Low risk	Low risk	High risk	Low risk
Gillham 2006	Some concerns	Some concerns	Low risk	High risk	Low risk
Gillham 2012(1)	Low risk	Some concerns	Some concerns	High risk	Low risk
Gillham 2012(2)	Low risk	Some concerns	Some concerns	High risk	Low risk
Shortt 2001	Some concerns	Low risk	Low risk	High risk	Low risk
Ishikawa 2019	Low risk	Low risk	Low risk	High risk	Low risk
Rooney 2013	Some concerns	Low risk	Some concerns	High risk	Low risk
Kendall 1994	Some concerns	Some concerns	Low risk	High risk	Low risk
Kennedy 2009	Low risk	Some concerns	High risk	High risk	Low risk
Kozina 2020	Some concerns	Some concerns	High risk	High risk	Low risk
Lau 2010	Some concerns	Low risk	Low risk	High risk	Low risk
Martinsen 2019	Some concerns	Some concerns	High risk	High risk	Low risk
Low riske 2021	Some concerns	Some concerns	Low risk	High risk	Low risk
Lupu 2009	Some concerns	Some concerns	Low risk	High risk	Low risk
Lyneham 2006	Some concerns	Some concerns	Low risk	High risk	Low risk
McLoone 2012(1)	Some concerns	Some concerns	Low risk	High risk	Low risk
McLoone 2012(2)	Some concerns	Some concerns	Low risk	High risk	Low risk
Mifsud 2005	Some concerns	Some concerns	Low risk	High risk	Low risk
Miller 2011	Some concerns	Low risk	Low risk	High risk	Low risk
Miller 2010	Some concerns	High risk	Low risk	High risk	Low risk

Mohammadi 2019	Some concerns	Some concerns	High risk	High risk	Low risk
Moharreri 2017	Low risk	Some concerns	Low risk	High risk	Low risk
Muris 2002	Some concerns	Some concerns	Low risk	High risk	Low risk
Morgan 2017	Low risk	Some concerns	High risk	High risk	Low risk
Omkarappa 2021	Some concerns	High risk	Some concerns	High risk	Low risk
Pahi 2010	Some concerns	High risk	High risk	High risk	Low risk
Pereira 2014	Some concerns	Low risk	High risk	High risk	Low risk
Rapee 2000	High risk	Some concerns	High risk	High risk	Low risk
Rapee 2006	Low risk	Some concerns	Low risk	High risk	Low risk
Rasing 2018	Low risk	Low risk	Low risk	High risk	Low risk
Rivero 2020	Some concerns	Some concerns	Low risk	High risk	Low risk
Rodgers 2015	High risk	High risk	High risk	High risk	Low risk
Ruttledge 2016	Some concerns	Low risk	High risk	High risk	Low risk
Sanders 2019	High risk	Some concerns	High risk	High risk	Low risk
Silverman 1999	Some concerns	Some concerns	High risk	High risk	Low risk
Siu 2007	Some concerns	Some concerns	Low risk	High risk	Low risk
Smith 2014	Some concerns	Low risk	Low risk	High risk	Low risk
Wuthrich 2012	Low risk	Some concerns	Low risk	High risk	Low risk
Villabø 2018(1)	Low risk	Low risk	Low risk	High risk	Low risk
Villabø 2018(2)	Low risk	Low risk	Low risk	High risk	Low risk
Vigerland 2016	Some concerns	Some concerns	Some concerns	High risk	Low risk

Starrenburg 2017	Low risk	Some concerns	Low risk	High risk	Low risk
Thirlwall 2013(1)	Some concerns	Low risk	Low risk	High risk	Low risk
Thirlwall 2013(2)	Some concerns	Low risk	Low risk	High risk	Low risk
Stjerneklar 2019	Low risk	Some concerns	Some concerns	High risk	Low risk
Swain 2015	Some concerns	Some concerns	Low risk	High risk	Low risk
Spence 2011(1)	Low risk	Some concerns	Some concerns	High risk	Low risk
Spence 2011(2)	Low risk	Some concerns	Some concerns	High risk	Low risk
Spence 2006(1)	Low risk	Low risk	Low risk	High risk	Low risk
Spence 2006(2)	Low risk	Low risk	Low risk	High risk	Low risk
Walkup 2008	Low risk	Low risk	Low risk	High risk	Low risk
Tien 2023	High risk	Some concerns	Low risk	High risk	Low risk
Skarphedinsson 2023	Low risk	Low risk	Low risk	High risk	Low risk
McLellan 2024	Low risk	Low risk	Low risk	High risk	Low risk
Clancy 2024	Low risk	Low risk	Low risk	High risk	Low risk
Diego 2024	Low risk	Some concerns	Some concerns	High risk	Low risk
Huang 2025	Low risk	Some concerns	High risk	High risk	Low risk
Ijaz 2024	Low risk	Some concerns	Low risk	High risk	Low risk
Javadi 2024	Low risk	Some concerns	Low risk	High risk	Low risk
Zemestani 2024	Low risk	Some concerns	High risk	High risk	Low risk

Appendix 2. Management of Missing Item-Level Data in the Quantitative Studies Presented in Chapter 3 and Chapter 5

Measurement	**Managing missing items (scaling up process)**
Preschool Anxiety Scale (PAS)	Including 28 items. Where ≥ 75% items completed (≥21 items), calculate prorated total score using completed items. Where ≥8 missing items, treat measure as missing.
Approach subscale of the Short Temperament Scale for Children (STSC-A)	Including 7 items. Where 6 items completed, calculate prorated total score using completed items. Where ≥2 missing items, treat measure as missing.
Generalised Anxiety Disorder Scale (GAD-7)	Including 7 items. Where 6 items completed, calculate prorated total score using completed items. Where ≥2 missing items, treat measure as missing.
Parent/carer Motivation Questionnaire	Including 6 items. Where at least 5 items are completed, calculate pro-rated total score using completed items.
Responses to Uncertainty and Low Environmental Structure (RULES)	Including 17 items. Where ≥ 75% items (≥ 13 items) completed, calculate prorated total score using completed items. Where ≥5 missing items, treat measure as missing.
Child Avoidance Measure (CAMP)	Including 8 items. Where ≥6 items completed, calculate prorated total score using completed items. Where ≥3 missing items, treat measure as missing.
Coping Questionnaire (CQ-P)	Including 3 items. Where first item is missing, treat measure as missing.
Parent Overprotection Scale (POS)	Including 19 items. Where ≥ 75% items completed (≥15 items), calculate prorated total score using completed items. Where ≥5 missing items, treat measure as missing.
Parenting Sense of Competence Scale-self efficacy scale (PSOC-SE)	Including 7 items. Where 6 items completed, calculate prorated total score using completed items. Where ≥2 missing items, treat measure as missing.

Appendix 3 Moderation Model Results of Complete Case Analyses in Chapter 3

3.1 Moderators of child anxiety symptom outcomes at 12 weeks post-randomisation and adjusted mean difference in subgroups (complete case analysis)

Candidate moderator	Dummy variable(s) for the moderator	p-value for group by moderator interaction	Subgroup	Intervention (n/N=361/434)			Usual school practice (n/N=350/431)			Adjusted between-group mean difference[2] at 12 weeks (95% CI)	p-value
				n[1]	Mean (SD) at baseline	Mean (SD) at 12 weeks	n[1]	Mean (SD) at baseline	Mean (SD) at 12 weeks		
Child year group	Dummy 1 (Reception vs. Year 1): Reception = 0, Year 1 = 1, Year 2 = 0 **Dummy 2 (Reception vs. Year 2): Reception = 0, Year 1 = 0, Year 2 = 1**	0.42 **0.04**	Reception	**109**	**35.57 (17.05)**	**26.36 (17.83)**	**95**	**40.58 (18.13)**	**36.18 (17.39)**	**-5.98 (-8.93 to -3.03)**	**0.000**
			Year 1	123	41.57 (16.38)	28.35 (16.54)	122	39.72 (16.48)	34.67 (15.70)	-7.66 (-10.42 to -4.91)	0.000
			Year 2	**129**	**43.38 (17.24)**	**31.05 (18.08)**	**131**	**45.81 (15.03)**	**43.40 (17.13)**	**-10.49 (-13.47 to -7.44)**	**0.000**
Child gender	Female=0 vs. male=1	0.17	Female	173	42.09 (17.39)	29.11 (17.01)	180	41.19 (16.03)	37.87 (16.95)	-9.44 (-11.84 to -7.04)	0.000
			Male	177	28.47 (18.08)	39.06 (16.82)	181	43.18 (17.30)	38.71 (17.62)	-6.99 (-9.40 to -4.59)	0.000
Child ethnicity	White British=0 vs. Others=1	0.22	White British	286	40.90 (16.92)	28.44 (17.28)	291	41.31 (16.41)	37.56 (16.16)	-8.83 (-10.68 to -6.97)	0.000
			Others	63	39.11 (18.35)	30.19 (18.82)	68	46.06 (17.24)	41.60 (20.23)	-5.33 (-9.74 to -0.92)	0.026
Parent/carer ethnicity	White British=0 vs. Others=1	0.12	White British	282	41.17 (17.04)	28.87 (17.36)	291	41.31 (16.38)	37.88 (16.82)	-8.92 (-10.83 to -7.01)	0.000
			Others	65	38.17 (17.64)	28.71 (18.53)	66	46.61 (17.30)	40.68 (17.99)	-5.08 (-9.22 to -0.93)	0.023
Parent/carer relationship with child[3]	Mother=0 vs. Father=1	0.20	Mother	326	40.86 (17.16)	28.99 (17.67)	338	42.30 (16.70)	38.51 (17.20)	-8.43 (-10.21 to -6.65)	0.000
			Father	23	36.04 (17.00)	25.87 (16.04)	19	39.47 (16.64)	32.00 (15.30)	**-3.47 (-8.82 to 1.88)**	**0.230**
Parent/carer partner cohabiting status	Cohabiting with a partner=0 vs. Not cohabiting with a partner=1	0.31	Cohabiting with a partner	307	40.21 (16.74)	28.47 (17.31)	308	41.79 (16.59)	37.47 (16.79)	-7.81 (-9.61 to -6.01)	0.000
			Not cohabiting with a partner	40	42.80 (19.81)	30.78 (18.98)	50	43.52 (17.07)	41.70 (17.89)	-10.38 (15.58 to -5.18)	0.000
Parent/carer education level	No undergraduate degree=0 vs. Having an undergraduate degree or above=1	0.33	Not having an undergraduate degree	129	42.53 (18.77)	31.49 (19.06)	142	45.05 (15.84)	41.92 (17.03)	-8.59 (-11.59 to -5.55)	0.000
			Having an undergraduate degree or above	214	39.27 (15.97)	27.05 (16.44)	210	40.13 (16.95)	35.67 (16.64)	-7.96 (-10.04 to -5.87)	0.000
Parent/career employment status	Not full-time employed=0 vs. Full-time employed=1	0.39	Not full-time employed	217	40.59 (17.80)	28.59 (18.00)	219	41.39 (16.31)	37.64 (17.08)	-8.45 (10.59 to -6.31)	0.000
			Full-time employed	112	39.79 (15.71)	28.74 (16.74)	115	43.37 (17.33)	39.30 (17.39)	-7.79 (-10.81 to -4.78)	0.000
Family IMD[4]		0.58	More deprived	60	42.42 (17.37)	29.37 (17.55)	52	47.17 (19.56)	42.48 (18.85)	-10.02 (-14.39, -5.66)	0.000

	More deprived=0 vs. less deprived=1		Less deprived	290	40.17 (17.11)	28.67 (17.56)	309	41.35 (16.03)	37.59 (16.77)	-8.07 (-9.92 to -6.23)	0.000
Parent/carer motivation for engagement	Not highly motivated=0 vs. highly motivated =1	0.06	Not highly motivated	209	36.55 (16.29)	26.62 (15.98)	215	39.70 (16.47)	36.02 (16.95)	-7.04 (-9.19 to -4.90)	0.000
			Highly motivated	140	46.30 (16.61)	31.61 (18.73)	141	45.90 (16.54)	41.57 (17.10)	-9.91 (-13.04 to -6.81)	0.000
Child elevated anxiety symptoms at baseline[5]	Negative=0 vs. Positive=1 Negative=0 vs. Positive=1	0.06	Negative	130	23.42 (6.53)	17.88 (10.02)	112	23.72 (7.62)	23.20 (10.66)	-5.15 (-7.54 to -2.76)	0.000
			Positive	220	50.69 (12.88)	35.23 (17.85)	249	50.49 (12.44)	45.08 (15.06)	-10.02 (-12.25 to -7.80)	0.000
Child behavioural inhibition at baseline[5]	Negative=0 vs. Positive=1 Negative=0 vs. Positive=1	0.61	Negative	267	37.62 (15.20)	26.23 (14.70)	259	37.42 (14.55)	34.02 (15.08)	-7.93 (-9.78 to -6.08)	0.000
			Positive	83	50.00 (19.59)	37.01 (22.77)	102	54.28 (15.65)	49.14 (17.36)	-8.44 (-12.24 to -4.65)	0.000
Parent/carer elevated anxiety at baseline[5]	Negative=0 vs. Positive=1	0.15	Negative	221	38.86 (16.04)	27.01 (16.38)	221	39.20 (15.40)	34.52 (14.95)	-7.27 (-9.28 to -5.27)	0.000
			Positive	129	43.47 (18.61)	31.84 (19.04)	140	46.91 (17.57)	44.25 (18.69)	-9.75 (-12.74 to -6.75)	0.000
Child elevated anxiety symptoms at screening stage[5]	Negative=0 vs. Positive=1 Negative=0 vs. Positive=1	0.36	Negative	108	26.51 (12.05)	18.52 (11.74)	79	24.78 (11.46)	24.35 (13.87)	-6.72 (-9.79 to -3.66)	0.000
			Positive	242	46.83 (15.28)	33.37 (17.77)	282	47.06 (14.53)	42.20 (15.92)	-8.63 (-10.65 to -6.61)	0.000
Child behavioural inhibition at screening stage[5]	Negative=0 vs. Positive=1 Negative=0 vs. Positive=1	0.80	Negative	245	38.09 (15.54)	26.60 (15.27)	250	37.64 (14.39)	34.65 (15.26)	-8.41 (-10.32 to -6.50)	0.000
			Positive	105	46.30 (19.30)	33.90 (21.14)	111	52.43 (17.00)	46.49 (18.37)	-7.51 (-11.00 to -4.03)	0.000
Parent/carer elevated anxiety at screening stage[5]	Negative=0 vs. Positive=1	0.35	Negative	170	41.39 (14.830	28.15 (15.80)	162	43.61 (13.88)	38.94 (14.110	-9.25 (-11.68 to -6.82)	0.000
			Positive	180	39.77 (19.09)	29.39 (19.06)	199	41.03 (18.61)	37.76 (19.29)	-7.44 (-9.78 to -5.10)	0.000
Children identified at risk of anxiety disorders on a single risk	Dummy 1 (child elevated anxiety only vs. behavioural inhibition only): child elevated anxiety only= 0, behavioural inhibition only= 1, parent elevated anxiety only= 0	0.28 **0.04**	Child elevated anxiety only	100	40.54 (12.05)	27.11 (13.03)	104	41.38 (11.06)	38.19 (12.35)	-10.54 (-13.39 to -7.69)	0.000
			Child behavioural inhibition only	22	25.73 (10.49)	17.41 (9.89)	8	33.88 (9.48)	28.25 (8.35)	-9.71 (-17.89 to -1.54)	0.038
			Parent elevated anxiety only	80	26.34 (12.40)	18.81 (12.54)	66	23.36 (11.13)	22.94 (13.22)	-6.05 (-9.40 to -2.69)	0.001

	Dummy 2 **(**child elevated anxiety only vs. parent elevated anxiety only**):** child elevated anxiety only= 0, behavioural inhibition only= 0, parent elevated anxiety only= 1										
Children identified at risk of anxiety disorders on a single risk vs. two risks[6]	Child elevated anxiety=0 vs. child elevated anxiety & child behavioural inhibition=1	0.27	Child elevated anxiety only	100	40.54 (12.05)	27.11 (13.03)	104	41.38 (11.06)	38.19 (12.35)	-10.54 (-13.39 to -7.69)	0.000
			child elevated anxiety & child behavioural inhibition	48	50.33 (15.42)	35.25 (19.72)	50	49.80 (17.26)	42.20 (17.12)	-7.31 (-12.50 to -2.12)	0.007
	Child elevated anxiety=0 vs. child elevated anxiety & parent elevated anxiety=1	0.23	Child elevated anxiety only	100	40.54 (12.05)	27.11 (13.03)	104	41.38 (11.06)	38.19 (12.35)	-10.54 (-13.39 to -7.69)	0.000
			child elevated anxiety & parent elevated anxiety	65	48.80 (14.41)	35.38 (16.68)	80	44.55 (12.42)	39.71 (15.31)	-7.86 (-11.89 to -3.83)	0.000
	Child behavioural inhibition=0, child elevated anxiety & child behavioural inhibition=1	0.63	Child behavioural inhibition only	22	25.73 (10.49)	17.41 (9.89)	8	33.88 (9.48)	28.25 (8.35)	-9.71 (-17.89 to -1.54)	0.038
			child elevated anxiety & child behavioural inhibition	48	50.33 (15.42)	35.25 (19.72)	50	49.80 (17.26)	42.20 (17.12)	-7.31 (-12.50 to -2.12)	0.007
	Parent elevated anxiety=0 vs. child elevated anxiety & parent elevated anxiety=1	0.95	Parent elevated anxiety only	80	26.34 (12.40)	18.81 (12.540	66	23.36 (11.13)	22.94 (13.22)	-6.05 (-9.40 to -2.69)	0.001
			Child elevated anxiety & parent elevated anxiety	65	48.80 (14.41)	35.38 (16.68)	80	44.55 (12.42)	39.71 (15.31)	-7.86 (-11.89 to -3.83)	0.000
Children identified at risk of anxiety disorders two risks[6] vs. three risks	Child elevated anxiety & child behavioural inhibition=0 vs. all three risks=1	0.66	Child elevated anxiety & Child behavioural inhibition	48	50.33 (15.42)	35.25 (19.72)	50	49.80 (17.26)	42.20 (17.12)	-7.31 (-12.50 to -2.12)	0.007
			All three risks	29	58.27 (17.75)	47.34 (21.70)	48	60.71 (11.98)	55.00 (16.37)	**-5.52 (-11.20 to 0.16)**	**0.066**
	Child elevated anxiety & parent elevated anxiety=0 vs. all three risks=1	0.53	Child elevated anxiety & Parent elevated anxiety	65	48.80 (14.41)	35.38 (16.68)	80	44.55 (12.42)	39.71 (15.31)	-7.86 (-11.89 to -3.83)	0.000
			All three risks	29	58.27 (17.75)	47.34 (21.70)	48	60.71 (11.98)	55.00 (16.37)	**-5.52 (-11.20 to 0.16)**	**0.066**

Note: 1. n is the number of children in each subgroup who had no missing data on the targeted moderator and the 12-week child anxiety symptom outcome.
2. The mean difference presented in the table was calculated based on adjusted model (controlling child baseline anxiety symptom levels, school-level free school meal status and cluster size).
3. Children who participated in the programme with other caregivers rather than their parents were not included in the analysis as the sample size was below 30 (n=8).
4. More deprived: the bottom 20% of the most deprived areas in UK (IMD≤ 20%), less deprived: the remaining 80%.
5. a PAS sum score ≥34 indicates elevated child anxiety symptoms, a STSC-A sum score ≥ 30 indicates elevated child behavioural inhibition, a GAD-7 sum score ≥ 8 indicates elevated parental anxiety.
6. Children who were screened positive on a combination of behavioural inhibition and parental elevated anxiety were not included in the analysis as the sample size was below 30 (n=13).

3.2 Moderators of child anxiety symptom outcomes at 12 months post-randomisation and adjusted between-group mean differences in subgroups (complete case analysis)

Candidate moderator	Dummy variable(s) for the moderator	p-value for group by moderator interaction	Subgroup	Intervention (n/N=314/434)			Usual school practice (N=321/431)			Adjusted between-group mean difference[2] at 12 months (95% CI)	p-value
				n[1]	Mean (SD) at baseline	Mean (SD) at 12 months	n[1]	Mean (SD) at baseline	Mean (SD) at 12 months		
Child year group	Dummy 1 (Reception vs. Year 1): Reception = 0, Year 1 = 1, Year 2 = 0 **Dummy 2 (Reception vs. Year 2): Reception = 0, Year 1 = 0, Year 2 = 1**	0.20 **0.01**	Reception	86	35.10 (17.25)	25.59 (17.45)	95	38.19 (17.33)	30.46 (15.86)	**-2.84 (-6.48 to 0.80)**	**0.131**
			Year 1	112	42.29 (16.65)	26.87 (17.38)	111	38.65 (16.94)	30.60 (15.89)	-6.17 (-9.52 to -2.82)	0.000
			Year 2	116	43.29 (16.23)	26.66 (16.01)	115	45.79 (15.16)	38.11 (18.22)	-9.84 (-13.45 to -6.20)	0.000
Child gender	Female=0 vs. male=1	0.48	Female	153	41.55 (16.83)	26.68 (17.05)	160	40.36 (15.86)	33.32 (16.05)	-7.41 (-10.10 to -4.71)	0.000
			Male	161	39.79 (17.11)	26.19 (16.71)	161	41.78 (17.65)	33.19 (18.12)	-5.94 (-9.11 to -2.78)	0.000
Child ethnicity	White British=0 vs. Others=1	0.18	White British	257	41.26 (16.88)	27.00 (17.07)	262	40.05 (16.37)	33.43 (16.95)	-7.31 (-9.55 to -5.07)	0.000
			Others	56	38.21 (17.41)	23.89 (15.89)	59	45.59 (17.91)	32.48 (17.85)	-3.94 (-8.70 to 0.81)	0.112
Parent/carer ethnicity	White British=0 vs. Others=1	0.28	White British	254	41.61 (17.06)	27.62 (17.41)	263	40.17 (16.46)	33.57 (17.11)	-7.00 (-9.28 to -4.73)	0.000
			Others	57	36.95 (16.26)	21.89 (13.32)	56	45.79 (17.65)	31.88 (17.36)	-4.50 (-9.07 to -0.20)	0.083

Parent/carer relationship with child[3]	Mother=0 vs. Father=1	0.08	Mother	289	41.07 (16.99)	26.82 (16.93)	299	41.23 (16.81)	33.85 (17.13)	-6.92 (-9.05 to -4.79)	0.000
			Father	24	35.96 (16.64)	21.71 (15.85)	19	38.42 (16.19)	22.53 (12.37)	1.46 (-4.83 to 7.74)	0.671
Parent/carer partner cohabiting status	Cohabiting with a partner=0 vs. Not cohabiting with a partner=1	0.14	Cohabiting with a partner	278	40.12 (16.52)	26.01 (16.28)	276	40.60 (16.61)	32.07 (16.53)	-5.74 (-7.85 to -3.64)	0.000
			Not cohabiting with a partner	34	45.59 (19.74)	30.09 (20.96)	43	43.14 (17.49)	38.95 (17.39)	-10.29 (-17.47 to -3.11)	0.008
Parent/carer education level	No undergraduate degree=0 vs. Having an undergraduate degree or above=1	0.94	Not having undergraduate degree	110	43.25 (18.91)	29.94 (19.00)	117	43.40 (16.50)	36.37 (17.79)	-6.42 (-10.14 to -2.69)	0.002
			Having an undergraduate degree or above	198	39.27 (15.61)	24.77 (15.44)	197	39.52 (16.69)	31.13 (16.30)	-6.04 (-8.62 to -3.50)	0.000
Parent/career employment status	Not full-time employed=0 vs. Full-time employed=1	0.23	Not full-time employed	200	40.69 (17.70)	26.55 (17.30)	192	40.51 (16.68)	33.55 (16.89)	-7.22 (-9.79 to -4.64)	0.000
			Full-time employed	96	40.18 (15.00)	26.36 (15.36)	105	41.78 (16.88)	32.02 (16.53)	-4.43 (-7.89 to -0.97)	0.014
Family IMD[4]	More deprived=0 vs. less deprived=1	0.55	More deprived	56	43.38 (18.16)	29.61 (20.32)	44	44.18 (20.49)	38.18 (20.79)	-8.75 (-14.63 to -2.66)	0.005
			Less deprived	258	40.11 (16.68)	25.75 (15.97)	277	40.58 (16.09)	32.47 (16.34)	-6.45 (-8.58 to -4.31)	0.000
Parent/carer motivation for engagement	Not highly motivated=0 vs. highly motivated =1	0.90	Not highly motivated	183	36.48 (16.16)	23.85 (15.68)	194	38.73 (16.67)	32.00 (16.49)	-6.85 (-9.47 to -4.24)	0.000
			Highly motivated	129	46.47 (16.27)	29.72 (17.56)	123	44.62 (16.39)	34.94 (17.98)	-6.61 (-9.84 to -3.38)	0.000
Child elevated anxiety symptoms at baseline[5]	Negative=0 vs. Positive=1 Negative=0 vs. Positive=1	0.93	Negative	113	23.46 (6.59)	15.61 (8.57)	109	23.50 (7.63)	22.12 (12.08)	-6.62 (-9.21 to -4.02)	0.000
			Positive	201	50.38 (12.80)	32.53 (17.32)	212	50.11 (12.46)	38.98 (16.48)	-6.63 (-9.41 to -3.85)	0.000
Child behavioural inhibition at baseline[5]	Negative=0 vs. Positive=1 Negative=0 vs. Positive=1	0.45	Negative	237	37.98 (15.30)	24.61 (14.61)	235	36.60 (14.61)	29.82 (14.36)	-5.97 (-8.12 to -3.81)	0.000
			Positive	77	49.04 (19.11)	32.06 (21.56)	86	53.28 (16.29)	42.64 (20.26)	-7.40 (-12.13 to -2.61)	0.005
Parent/carer elevated anxiety at baseline[5]	Negative=0 vs. Positive=1	0.80	Negative	203	39.04 (15.78)	24.80 (16.03)	205	38.49 (15.41)	30.81 (15.47)	-6.36 (-8.84 to -3.87)	0.000
			Positive	111	43.72 (18.63)	29.44 (17.96)	116	45.63 (18.13)	37.56 (18.96)	-6.86 (-10.31 to -3.40)	0.000

Child elevated anxiety symptoms at screening stage[5]	Negative=0 vs. Positive=1 Negative=0 vs. Positive=1	0.24	Negative	93	26.23 (11.66)	17.20 (12.67)	76	23.70 (10.60)	20.43 (11.44)	-4.35 (-7.75 to -0.95)	0.014
			Positive	221	46.77 (15.07)	30.33 (16.91)	245	46.46 (14.53)	37.23 (16.61)	-7.07 (-9.53 to -4.60)	0.000
Child behavioural inhibition at screening stage[5]	Negative=0 vs. Positive=1 Negative=0 vs. Positive=1	0.22	Negative	221	38.06 (15.39)	24.86 (14.64)	231	37.08 (14.73)	30.03 (14.49)	-5.71 (-7.92 to 3.50)	0.000
			Positive	93	46.95 (18.89)	30.18 (20.83)	90	51.31 (17.41)	41.53 (20.29)	-8.29 (-12.67 to -3.91)	0.001
Parent/carer elevated anxiety at screening stage[5]	Negative=0 vs. Positive=1	0.67	Negative	155	41.34 (14.22)	25.54 (14.04)	147	43.10 (13.56)	33.67 (15.71)	-7.17 (-10.06 to -4.28)	0.000
			Positive	159	40.06 (19.29)	27.31 (19.21)	174	39.36 (18.94)	32.90 (18.22)	-6.12 (-9.15 to -3.09)	0.000
Children identified at risk of anxiety disorders on a single risk	Dummy 1 (child elevated anxiety only vs. behavioural inhibition only): child elevated anxiety only= 0, behavioural inhibition only= 1, parent elevated anxiety only= 0 Dummy 2 **(**child elevated anxiety only vs. parent elevated anxiety only**):** child elevated anxiety only= 0, behavioural inhibition only= 0, parent elevated anxiety only= 1	0.13 0.18	Child elevated anxiety only	93	40.47 (12.11)	25.13 (12.11)	96	41.09 (11.22)	32.23 (13.85)	-6.95 (-10.40 to -3.50)	0.000
			Child behavioural inhibition only	18	25.89 (11.51)	15.28 (11.28)	8	33.88 (9.48)	18.13 (10.94)	-0.59 (-11.17 to 10.06)	0.920
			Parent elevated anxiety only	70	25.75 (111.55)	18.24 (13.21)	63	22.13 (10.02)	19.87 (11.15)	-3.75 (-7.51 to 0.01)	0.055
Children identified at risk of anxiety disorders on a single risk vs. two risks[6]	Child elevated anxiety=0 vs. child elevated anxiety & child behavioural inhibition=1	0.45	Child elevated anxiety only	93	40.47 (12.11)	25.13 (12.11)	96	41.09 (11.22)	32.23 (13.85)	-6.95 (-10.40 to -3.50)	0.000
			Child elevated anxiety & child behavioural inhibition	44	49.50 (13.72)	30.61 (16.47)	43	49.28 (16.57)	39.77 (17.76)	-9.77 (-15.72 to -3.82)	0.002
	Child elevated anxiety=0 vs. child elevated anxiety & parent elevated anxiety=1	0.66	Child elevated anxiety only	93	40.47 (12.11)	25.13 (12.11)	96	41.09 (11.22)	32.23 (13.85)	-6.95 (-10.40 to -3.50)	0.000
			Child elevated anxiety &	58	49.05 (14.04)	32.43 (16.35)	72	44.82 (12.87)	35.97 (13.46)	-5.72 (-10.91 to -0.54)	0.040

			parent elevated anxiety								
	Child behavioural inhibition=0, child elevated anxiety & child behavioural inhibition=1	0.10	Child behavioural inhibition only	18	25.89 (11.51)	15.28 (11.28)	8	33.88 (9.48)	18.13 (10.94)	-0.59 (-11.17 to 10.06)	0.920
			Child elevated anxiety & child behavioural inhibition	44	49.50 (13.72)	30.61 (16.47)	43	49.28 (16.57)	39.77 (17.76)	-9.77 (-15.72 to -3.82)	0.002
	Parent elevated anxiety=0 vs. child elevated anxiety & parent elevated anxiety=1	0.39	Parent elevated anxiety only	70	25.75 (111.55)	18.24 (13.21)	63	22.13 (10.02)	19.87 (11.15)	-3.75 (-7.51 to 0.01)	0.055
			Child elevated anxiety & parent elevated anxiety	58	49.05 (14.04)	32.43 (16.35)	72	44.82 (12.87)	35.97 (13.46)	-5.72 (-10.91 to -0.54)	0.040
Children identified at risk of anxiety disorders on two risks[6] vs. three risks	Child elevated anxiety & child behavioural inhibition=0 vs. all three risks=1	0.45	Child elevated anxiety & child behavioural inhibition	44	49.50 (13.72)	30.61 (16.47)	43	49.28 (16.57)	39.77 (17.76)	-9.77 (-15.72 to -3.82)	0.002
			All three risks	26	59.65 (18.44)	43.73 (24.56)	34	61.53 (12.60)	50.79 (20.57)	-5.12 -13.20 to 2.96)	0.230
	Child elevated anxiety & parent elevated anxiety=0 vs. all three risks=1	0.95	Child elevated anxiety & parent elevated anxiety	58	49.05 (14.04)	32.43 (16.35)	72	44.82 (12.87)	35.97 (13.46)	-5.72 (-10.91 to -0.54)	0.040
			All three risks	26	59.65 (18.44)	43.73 (24.56)	34	61.53 (12.60)	50.79 (20.57)	-5.12 (-13.20 to 2.96)	0.230

**Note:* 1. n is the number of children in each subgroup who had no missing data on the targeted moderator and the 12-month child anxiety symptom outcome.
2. The mean difference presented in the table was calculated based on adjusted model (controlling child baseline anxiety symptom levels, school-level free school meal status and cluster size).
3. Children who participated in the programme with other caregivers rather than their parents were not included in the analysis as the sample size was below 30 (n=8).
4. More deprived: the bottom 20% of the most deprived areas in UK (IMD≤ 20%), less deprived: the remaining 80%.
5. a PAS sum score ≥34 indicates elevated child anxiety symptoms, a STSC-A sum score ≥ 30 indicates elevated child behavioural inhibition, a GAD-7 sum score ≥ 8 indicates elevated parental anxiety.
6. Children who were screened positive on a combination of behavioural inhibition and parental elevated anxiety were not included in the analysis as the sample size was below 30 (n=13).

3.3 Moderators of child anxiety disorder diagnosis outcomes at 12 months post-randomisation and adjusted odd ratios in subgroups (completed case analysis)

Candidate moderator	Dummy variable(s) for the moderator	p-value for group by moderator interaction	Subgroup	Intervention (n/N=310/434)		Usual school practice (n/N=313/431)		Adjusted odd ratio (95% CI)[2]	p-value
				n[1]	Diagnosis rate	n[1]	Diagnosis rate		
Child year group	Dummy 1 (Reception vs. Year 1): Reception = 0, Year 1 = 1, Year 2 = 0 **Dummy 2 (Reception vs. Year 2): Reception = 0, Year 1 = 0, Year 2 = 1**	0.13 **0.02**	Reception	87	1.15%	89	10.10%	**0.13 (0.02 to 1.06)**	**0.06**
			Year 1	109	5.50%	115	7.83%	0.60 (0.18 to 1.96)	0.40
			Year 2	114	12.30%	109	16.50%	**0.92 (0.42 to 2.01)**	**0.83**
Child gender	Female=0 vs. Male=1	0.14	Female	159	6.29%	154	14.30%	0.43 (0.19 to 0.96)	0.04
			Male	151	7.28%	159	8.81%	0.92 (0.37 to 2.26)	0.85
Child ethnicity	White British=0 vs. Others=1	0.19	White British	254	6.30%	256	12.10%	0.57 (0.29 to 1.12)	0.10
			Others[7]	55	9.09%	57	8.78%	1.39 (0.35 to 5.55)	0.64
Parent/carer ethnicity	White British=0 vs. Others=1	0.36	White British	249	7.23%	257	12.50%	0.61 (0.32 to 1.16)	0.13
			Others[7]	58	5.17%	54	7.41%	0.69 (0.14 to 3.30)	0.64
Parent/carer relationship with child[3]	Mother=0 vs. Father=1	0.26	Mother	286	7.34%	286	12.2%	0.67 (0.36 to 1.23)	0.19
			Father[8]	23	——	22	——	——	
Parent/carer partner cohabiting status	Cohabiting with a partner=0 vs. Not cohabiting with a partner=1	0.55	Cohabiting with a partner	274	6.57%	272	10.30%	0.69 (0.36 to 1.33)	0.27
			Not cohabiting with a partner[7]	33	9.09%	40	20.00%	0.63 (0.14 to 2.79)	0.54
Parent/carer education level	Not having undergraduate degree=0 vs. Having an undergraduate degree or above=1	0.91	Not having an undergraduate degree	109	8.26%	117	12.00%	0.67 (0.26 to 1.70)	0.40
			Having an undergraduate degree or above	195	6.15%	192	11.50%	0.56 (0.26 to 1.22)	0.14
Parent/career employment status	Not full-time employed=0 vs. Full-time employed=1	0.75	Not full-time employed	191	7.85%	184	13.00%	0.68 (0.33 to 1.38)	0.28
			Full-time employed[7]	101	4.95%	104	7.69%	0.91 (0.26 to 3.11)	0.88
Family IMD[4]	More deprived=0 vs. Less deprived=1	0.40	More deprived	52	11.5%	39	15.4%	1.04 (0.28 to 3.88)	0.95
			Less deprived	258	5.81%	274	10.90%	0.57 (0.28 to 1.15)	0.12
Parent/carer motivation for engagement	Not highly motivated=0 vs. Highly motivated =1	0.34	Not highly motivated	179	6.70%	183	9.29%	0.78 (0.34 to 1.77)	0.55
			Highly motivated	128	7.03%	126	14.3%	0.45 (0.19 to 1.07)	0.07
Child elevated anxiety symptoms at baseline[5]	Negative=0 vs. Positive=1	0.98	Negative	112	2.68%	106	4.72%	0.60 (0.14 to 2.60)	0.49
			Positive	198	9.09%	207	15.00%	0.61 (0.31 to 1.18)	0.14
	Negative=0 vs. Positive=1	0.17	Negative	233	3.86%	230	9.13%	0.42 (0.18 to 1.00)	0.05

Child behavioural inhibition at baseline[5]			Positive	77	15.70%	83	18.10%	0.92 (0.37 to 2.26)	0.84
Parent/carer elevated anxiety at baseline[5]	Negative=0 vs. Positive=1	0.29	Negative	201	6.97%	201	8.96%	0.86 (0.39 to 1.85)	0.69
			Positive[7]	109	6.42%	112	16.10%	0.37 (0.14 to 1.01)	0.05
Child elevated anxiety at screening stage[5]	Negative=0 vs. Positive=1	0.59	Negative	95	3.16%	75	6.67%	0.35 (0.07 to 1.73)	0.20
			Positive	215	8.37%	238	13.00%	0.69 (0.36 to 1.34)	0.27
Child behavioural inhibition at screening stage[5]	Negative=0 vs. Positive=1	0.33	Negative	216	3.70%	228	7.89%	0.53 (0.22 to 1.30)	0.17
			Positive	94	13.80%	85	21.20%	0.89 (0.38 to 2.05)	0.78
Parent/carer elevated anxiety at screening stage[5]	Negative=0 vs. Positive=1	0.34	Negative	156	7.69%	147	10.90%	0.74 (0.33 to 1.66)	0.46
			Positive[7]	154	5.84%	166	12.00%	0.48 (0.20 to 1.16)	0.10
Children identified at risk of anxiety disorders on a single risk	Dummy 1 (child elevated anxiety only vs. behavioural inhibition only): child elevated anxiety only= 0, behavioural inhibition only= 1, parent elevated anxiety only= 0 Dummy 2 **(**child elevated anxiety only vs. parent elevated anxiety only**):** child elevated anxiety only= 0, behavioural inhibition only= 0, parent elevated anxiety only= 1	0.67 0.59	Child elevated anxiety only	91	3.30%	97	8.25%	0.46 (0.11 to 1.87)	0.28
			Child behavioural inhibition only	20	10.00%	8	12.50%	0.79 (0.06 to 10.16)	0.85
			Parent elevated anxiety only[7]	70	1.43%	61	6.56%	0.21 (0.02 to 1.90)	0.16
Children identified at risk of anxiety disorders on a single risk vs. two risks[6]	Child elevated anxiety only=0 vs. child elevated anxiety & child behavioural inhibition=1	0.28	Child elevated anxiety only	91	3.30%	97	8.25%	0.47 (0.11 to 1.97)	0.30
			Child elevated anxiety & child behavioural inhibition	45	15.60%	42	16.70%	1.16 (0.32 to 4.19)	0.82
	Child elevated anxiety=0 vs. child elevated anxiety & parent elevated anxiety=1	0.47	Child elevated anxiety only	91	3.30%	97	8.25%	0.47 (0.11 to 1.97)	0.30
			Child elevated anxiety & parent elevated anxiety	55	7.27%	70	8.57%	0.96 (0.15 to 6.05)	0.97
	Child behavioural inhibition=0, child elevated anxiety & child behavioural inhibition=1	0.85	Child behavioural inhibition only	20	10.00%	8	12.50%	1.70 (0.07 to 43.04)	0.75
			Child elevated anxiety & child behavioural inhibition	45	15.60%	42	16.70%	1.16 (0.32 to 4.19)	0.82
		0.11	Parent elevated anxiety only[7]	70	1.43%	61	6.56%	0.21 (0.02 to 1.90)	0.16

	Parent elevated anxiety=0 vs. child elevated anxiety & parent elevated anxiety=1		Child elevated anxiety & parent elevated anxiety	55	7.27%	70	8.57%	0.98 (0.25 to 3.87)	0.98
Children identified at risk of anxiety disorders on two risks[6] vs. three risks	Child elevated anxiety & child behavioural inhibition=0 vs. all three risks=1	0.31	Child elevated anxiety & child behavioural inhibition	45	15.60%	42	16.70%	1.16 (0.32 to 4.19)	0.82
			All three risks	24	16.70%	29	34.50%	0.46 (0.11 to 1.94)	0.29
	Child elevated anxiety & parent elevated anxiety=0 vs. all three risks=1	0.49	Child elevated anxiety & parent elevated anxiety	55	7.27%	70	8.57%	0.98 (0.25 to 3.87)	0.98
			All three risks	24	16.70%	29	34.50%	0.46 (0.11 to 1.94)	0.29

**Note:* 1. n is the number of children in each subgroup who had no missing data on the targeted moderator and the 12-month child anxiety diagnosis outcome.
2. Adjusted odd ratio (95%CI) was calculated based on adjusted model (controlling child baseline anxiety symptom levels, school-level free school meal status and cluster size).
3. Children who participated in the programme with other caregivers rather than their parents were not included in the analysis as the sample size was below 30 (n=8).
4. More deprived: the bottom 20% of the most deprived areas in UK (IMD≤ 20%), less deprived: the remaining 80%.
5. a PAS sum score ≥34 indicates elevated child anxiety symptoms, a STSC-A sum score ≥ 30 indicates elevated child behavioural inhibition, a GAD-7 sum score ≥ 8 indicates elevated parental anxiety.
6. Children who were screened positive on a combination of behavioural inhibition and parental elevated anxiety were not included in the analysis as the sample size was below 30 (n=13).
7. The model adjusted for child baseline anxiety symptom levels, school-level free school meal status and cluster size cannot be identified given the small sample size of the subgroup. The odd ratio of this subgroup was calculated based on the unadjusted model (without controlling child baseline anxiety symptom levels, school-level free school meal status and cluster size). For comparison, for other subgroup(s) of the candidate moderator, we also presented the odd ratios calculated based on the unadjusted model. But the diagnosis rate of each subgroup was calculated based on imputed data.
8. The model adjusted for child baseline anxiety symptom levels, school-level free school meal status and cluster size cannot be identified given the small sample size of the subgroup. We also run unadjusted model which cannot be identified either. The diagnosis rate within intervention group of this subgroup cannot be calculated because in the complete case dataset and some of the imputed datasets, none of children in this subgroup was diagnosed with an anxiety disorder.

Appendix 4 Participant Characteristics of the Qualitative Studies in Chapter 4 and Chapter 6.

ID	Child age	Child gender	Relationship with child	Parent ethnicity	Parent education	Employment status	Cohabiting with partner	No. of children in household	Total family income before tax per year[10]	Positive screening outcome
1	6.5	F	Mother	White British	Higher education	Student	Yes	More than one child	Under £30,000	CA, CB
2	6.1	F	Mother	White British	Higher education	Unemployed	No	Only child	Under £30,000	CA
3	5.9	M	Father	Other white background	Further education	Full-time employment	Yes	More than one child	Over £30,000	CA
4	7.2	M	Mother	White British	Higher education	Full-time employment	Yes	More than one child	Over £30,000	CA, PA
5	7.0	F	Mother	White British	Higher education	Full-time employment	Yes	More than one child	Over £30,000	PA
6	5.8	M	Mother	White British	Further education	Part-time employment	Yes	More than one child	Under £30,000	CA, CB, PA
7	6.7	F	Mother	Asian or Asian British	Higher education	Full-time employment	Yes	Only child	Over £30,000	CA, CB
8	4.6	F	Mother	White British	Higher education	Full-time employment	No	Only child	Under £30,000	CA, PA
9	4.5	F	Mother	White and Black African	Further education	Full-time employment	Yes	More than one child	Over £30,000	CA, PA
10	5.0	M	Mother	Missing	Higher education	Other	Yes	Only child	Over £30,000	CA
11	6.6	F	Father	White British	Postgraduate qualification	Full-time employment	Yes	More than one child	Over £30,000	PA
12	6.7	M	Mother	Asian or Asian British	Higher education	Other	Yes	More than one child	Missing	CA, PA
13	6.3	M	Mother	African	Postgraduate qualification	Missing	Yes	More than one child	Missing	CA
14	7.0	M	Mother	White British	Higher education	Part-time employment	Yes	More than one child	Over £30,000	CA
15	7.7	M	Mother	Other white background	Postgraduate qualification	Unemployed	Yes	More than one child	Over £30,000	CA
16	7.5	M	Mother	Asian or Asian British	Postgraduate qualification	Part-time employment	Yes	Only child	Over £30,000	CB
17	7.5	M	Mother	Other white background	Other	Unemployed	Yes	More than one child	Missing	CA, CB, PA
18	6.4	M	Mother	Other white background	Postgraduate qualification	Part-time employment	Yes	More than one child	Over £30,000	CA
19	7.6	M	Mother	Other white background	Other	Other	Yes	More than one child	Under £30,000	CA, PA

[10] The median household disposable income in the UK was £29,600-32,400 in 2019-2022.

19	7.6	M	Mother	Other white background	Other	Other	Yes	More than one child	Under £30,000	CA, PA

Note. ID=Participant identification number; M=Male; F=Female; School completion=Finishing high school education or below; Further education=Finishing college, vocational courses; Higher education=Having undergraduate degree; Part-time employment=working less than 30 work hours per week; Full-time employment=working 30+hours per week; CA=Child elevated anxiety symptoms; CB=Child behavioural inhibition; PA=Parental elevated anxiety symptoms.