How do secondary-aged pupils experience anxiety and how effective are school-based interventions in supporting them? A systematic review.

Taj Braich

University College London, Institute of Education

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I, Taj Braich, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Signed: **Taj Braich May 2021**

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Abstract

Anxiety is experienced in various forms, however when it is experienced at a greater level, it can become unmanageable and cause disruption to an individual's day to day life and general functioning. A wealth of research has been conducted to explore the experience of anxiety amongst children and young people (CYP) and possible contributing factors, Research has also explored the impact of school-based interventions such as Cognitive Behavioural Therapy (CBT), in determining their effectiveness in reducing anxiety levels within CYP, with varying results reported.

However, to date, a systematic review has not been conducted to explore the quality and validity of this research. Therefore, the purpose of this systematic review is to determine how anxiety is experienced by secondary-aged pupils and how effective school-based interventions are in supporting them.

The review has been conducted in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2009). A systematic literature search was conducted, and 10 studies were deemed eligible for the review. These were assessed for bias using the revised Cochrane Risk of Bias tool (Higgins, Savovic, et al., 2019).

The results suggest that females do experience higher levels of anxiety compared to males, with varying contributing factors such as transitions, school type, learning skills and multi-dimensional constructs. Furthermore, although CBT interventions were not found to be effective in reducing anxiety levels, a decrease in symptoms, such as uncertain control and panic, were reported. However, generally the studies were deemed to be low quality and results should be considered with caution. The review is subject to a number of limitations due to the scope and process.

Impact Statement

Current research identifies the prevalence of anxiety in children and young people (CYP), the causes, and the effectiveness of interventions. However, to date, there has been no exploration of the quality and validity of these studies in identifying how anxiety is experienced or the level of impact a school-based intervention has. Therefore, this systematic review seeks to explore how secondary-aged pupils experience anxiety and how effective school-based interventions are, in supporting their needs.

The results are beneficial for researchers as well as educational professionals who work directly with adolescents. For researchers, the systematic review uncovers potential gaps and areas for further research to be conducted. For example, conducting a systematic review of research that has explored the prevalence of anxiety in primary aged pupils and how effective interventions are in supporting them. Additionally, exploring the association between special educational needs and disabilities (SEND) and anxiety. Furthermore, it provides researchers with knowledge of how high quality research could be conducted, in order for results to be considered reliable.

Within the educational profession in the UK, such as for educational psychologists (EPs), the results reported help to identify what factors can contribute to anxiety and how this may impact not only pupils of secondary age, but any differences between males and female students. Furthermore, the results provide an insight into the effectiveness of interventions which can inform EP practice when recommending or delivering them to pupils. For example, professionals working with this age group,

can explore potential underlying factors when working with groups of pupils, as well as at a systemic level by delivering training to teaching staff.

To ensure that researchers and educational professionals will benefit from the results of this systematic review, systemic work will be carried out in the EP service, through training, so that the results can be disseminated and applied to EP practise. Furthermore, the results will also be considered when engaging in consultation work with EPs and parents/carers through verbal and written work. Systemic work such as training to secondary school staff, will be offered so that the findings can be shared and help to inform practise.

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Glossary of abbreviations

Abbreviated Maths Anxiety Scale (AMAS)

Adapted version of Liebowitz Social Anxiety Scale (LSAS-CA)

Advanced Level (A-Level)

American Psychiatric Disorder (APA)

Anxiety Disorders Interview Schedule for DSM-IV, Child and Parent Versions (ADIS-C/P)

Association of Educational psychologists (AEP)

Association of Colleges (AoC)

Attention-Support Control (ASC)

Autism Spectrum Disorder (ASD)

Behavioural Inhibition (BI)

Behaviourally Uninhibited (BUI)

British Education Index (BEI)

British Psychology Society (BPS)

Children and young people (CYP)

Children and Adolescent Mental Health Services (CAMHS)

Cochrane Risk of Bias Tool 2 (RoB 2)

Cognitive Behavioural Therapy (CBT)

Cognitive Bias Modification (CBM)

Cognitive Reflection Task (CRT)

Collaborative Psychiatric Epidemiology Studies (CPES)

Conditioned Response (CR)

Conditioned Stimuli (CS+)

Confirmatory Factor Analysis (CFA)

Control Stimulus (CS-)

Critical Appraisal Skills Programme (CASP)

Culturally Adopted CBT-Based Guided Self-Help (CACBT-GSH)

Development and Well-being scale (DABA)

The Diagnostic and Statistical Manual of Mental Disorders (DSM-5)

Early Years and Foundation Stage (EYFS)

Education Resource Information Centre (ERIC)

Educational psychologist (EP)

English First Language (EFL)

Fear of Negative Evaluation Scale (FNES)

Free School Meals (FSM)

Further Education (FE)

General Certificate of Secondary Education (GCSE)

General Practitioner (GP)

Generalised Anxiety Disorder (GAD)

General Health Questionnaire (GHQ)

Glasgow Anxiety Scales (GAS-ID)

The Great Smoky Mountain Study (GSMS)

High Maths Anxiety (HMA)

Institute of Education (IoE)

Listening Span Task (LST)

Low Maths Anxiety (LMA)

Maths Learning Anxiety (MLA)

Maths Test Anxiety (MTA)

Mental Health Support Teams (MHSTs)

Multidimensional Anxiety Scale for Children (MASC)

National Health Service (NHS)

National Institute for Health and Care Excellence (NICE)

Negative Automatic Thoughts (NATs)

Obsessive Compulsive Disorder (OCD)

Panic Disorder (PD)

Placement Test (PT)

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)

Postgraduate Certificate in Education (PGCE)

Primary Mental Abilities (PMA)

Prospective Register of Systematic Reviews (PROSPERO)

Randomised Controlled Trial (RCT)

The Revised Children's Manifest Anxiety Scale: Second Edition (RCMAS-2)

Revised Test Anxiety Scale (RTA)

Rosenberg Self-Esteem Scale (RSES)

School-Related Wellbeing scale (SWBS)

Self-perception Profile for Children (SPPC)

Separation Anxiety Disorder (SAD)

Short Term Memory (STM)

The Sibling Relationship Inventory (SRI)

Skills for Academic and Social Success (SASS)

Skin Conductance Rates (SCR)

Social anxiety measure: Revised Child Anxiety and Depression Scale (RCAD)

Social, Emotional and Mental Health (SEMH)

Social Phobia and Anxiety Inventory (SPAI)

Social Support Scale for Children (SSSC)

Socioeconomic Status (SES)

Special Educational Needs and Disabilities (SEND)

Specialist Unit for Review Evidence (SURE)

Specific Phobia (SP)

Standard Deviations (SD)

State Test Anxiety (STA)

State-Trait Anxiety Inventory (STAI)

Taming Worried Dragons (TWD)

The Strategies to Tackle Exam Pressure and Stress (STEPS)

Test Anxiety (TA)

Total Maths Anxiety (TMA)

Trait Test Anxiety (TTA)

Treatment as usual (TAU)

United Kingdom (UK)

United States of America (USA)

University College London (UCL)

Working Memory (WM)

Chapter one: Introduction

1.0 Chapter overview

In this chapter, the perceived problem will be outlined. This will be followed by the aims of the research, justification and rationale, and the relevance of the research for Educational Psychology (EP) practice. Finally, the thesis structure will be outlined.

1.1 Problem statement

With a growing awareness of social, emotional, and mental health (SEMH) needs in schools, more pupils appear to be identified as experiencing a heightened level of anxiety. This is particularly evident within EP services, with more referrals being made by schools to seek support and advice for teachers and education staff, allowing them to meet the needs of CYP in the setting.

However, particularly in secondary school, it appears to be female pupils who are often referred and identified as experiencing anxiety, and males being identified as having behavioural needs. In this case, are these referrals because females do experience greater levels of anxiety to their male peers? Alternatively, is it because externalising behaviours are not viewed as anxiety? How do secondary-aged pupils experience anxiety? What are the causes and contributions of their perceived anxiety?

When offering advice within reports, specifically the recommendations of school-based interventions, those with a Cognitive Behavioural Therapy (CBT) approach appear to be more commonly proposed. However, are these interventions effective in reducing the anxiety in pupils, and are there any alternatives to CBT that would be effective in treating anxiety?

There appears to be a wealth of literature available in answering these questions (see Chapter Two), however there has not yet been a systematic review conducted, to establish the quality of these studies and if the results are valid and trustworthy. It is of significant importance that EPs are aware of the validity of current research to inform their own knowledge and practice. In addition, it is important to have a strong evidence base when recommending interventions to support pupils with anxiety.

1.2 Aims of the current research

This study will seek to systematically review research published between 2010-2021, that establish how anxiety is experienced by secondary-aged pupils and if interventions are effective in helping to reduce these levels. In the systematic review, anxiety is referred to as that which has been either clinically diagnosed or is experienced at a significant level that hinders an individual's ability to function on a daily basis. The review will also report on the quality and reliability of the results in this area. It is hoped that the results of the systematic review will help to identify how anxiety is experienced in secondary-aged participants and if interventions are successful, in addition to raising awareness of any gaps in the literature or questions which remain unanswered.

1.3 Rationale and justification of the current research

In the last decade, there has been a focus and push forward in supporting mental health needs not only through clinical services, but in schools. Mental health has been defined as the way an individual feels within their own mind and how this impacts them, which includes our emotional, psychological, and social well-being. More specifically, an individual's mental health determines how they are able to manage stress, relate to others and make daily choices (Department of Health, 2011; Mentalhealth.gov, 2020). Varying feelings and symptoms have been identified

as being common within mental health problems, including stress, anxiety, panic and fear (NHS, 2021). In 2017, the British government published a Green Paper for Transforming Children and Young People's Mental Health (Department of Health & Department for Education, 2017), which outlined a proposal to expand access for mental health care for CYP. This focused particularly on reducing waiting time for clinical services and providing support through schools and colleges, and was followed by the Government's Response to the Consultation on Transforming Children and Young People's Mental Health Provision: a Green Paper and Next Steps (Department of Health and Social Care & Department for Education, 2018). The paper outlined the requirement for each school to appoint a mental health lead, in addition to new Mental Health Support Teams (MHSTs). The creation of this role within schools was intended to provide early interventions for mental health and well-being concerns, such as mild to moderate anxiety, as well as supporting schools in offering a whole school approach.

Historically, data has reported that in the United Kingdom (UK), one in ten young people would experience mental health problems (Green et al., 2005). However, this has been more recently reported to be one in eight (NHS Digital, 2018) with approximately one in five adolescents reporting symptoms of an emotional disorder (Gee et al., 2021).

Research investigating anxiety has long been interested in its prevalence amongst different age groups, between males and females and in identifying causes of this proposed difference (Craske, 2003), with anxiety being reported in children as young as 5 and 6 years old (Harari et al., 2013; Ramirez et al., 2019). The research also suggests that whilst anxiety is prevalent in younger children, it is more likely to be present in older pupils (Karande et al., 2018). More specifically however, older

females are identified as having a higher level of anxiety compared to their male peers and younger children (Eysenck & Eysenck, 1976; Karande et al., 2018).

Biological, psychological, and environmental explanations have been explored and proposed to explain these differences. Environmental explanations suggest that this is due to females reporting a higher level of emotional intensity (Eisenberg et al., 1996) due the assignment of gender roles and accepted norms of behaviour, which begins as early as two years of age (Martin et al., 2002). Furthermore, factors such as perceived school stress, self-esteem and family dysfunction have also been reported to be causes of anxiety in CYP (Guo et al., 2018; Rappo et al., 2017).

Biological models, propose that a single gene mutation alters the developmental schedule for a particular trait and thus evolution has caused the onset of anxiety over time (Hofer, 2010). In contrast psychological theories, such as the control-value theory, identify that appraisals of control and value are key to the onset of achievement emotions such as anxiety. As with all emotions, anxiety is believed to be multi-componential, involving uneasiness and nerves (the affective component), worrying (cognitive component), avoidance motivation (motivational component), anxious facial expressions (expressive component) and peripheral physiological activation (physiological component) (Pekrun, 2006).

Additional models focus specifically on types of anxiety and explore how they are caused. For example, generalized anxiety disorder (GAD) is proposed to occur as a product of a ‘vicious cycle’ in which stress provokes the onset of anxiety. This in turn triggers physical symptoms such as trembling, heart palpitations, sweating or hyperventilating. These then result in the individual experiencing further anxiety (Lader & Uhde, 2006).

Research has also explored the many ways in which to support CYP to reduce their anxiety, with a particular focus on school-based interventions. Commonly, these interventions adhere to the CBT guidelines and explore the impact, however research has also explored the effectiveness of alternative programs, specifically when targeting a particular anxiety type (Alanazi, 2020; Brown et al., 2019). Such interventions have been delivered in a variety of ways; individually, small groups or as a whole school approach with the effect size being evaluated where control groups have been included. The effect size reports the magnitude of the experimental effect between two variables and shows how strong the relationship is between them. According to the literature, interventions have produced varying results regarding their effectiveness. Interventions that have been delivered at an individual level have been found to be effective in reducing participant's anxiety through development of skills and strategies such as mindfulness and adopting a positive perception approach (Aydin & Aydin, 2020; March et al., 2019). However group interventions have not yet conclusively provided evidence in the effectiveness of reducing anxiety, with some interventions identifying a significant reduction (Alanazi, 2020; Ugwuanyi et al., 2020), compared to others which found a reduction in anxiety but not due to the effects of the intervention itself (Miller et al., 2010).

Over the years, the increasing roles and responsibilities of teachers and education staff have included the need to support CYP with mental health and well-being. However, literature exploring the views of educators and their confidence to support CYP in school, has shown that those with lower levels of self-confidence and knowledge of mental health needs have greater difficulty implementing effective classroom strategies and interventions (Graczyk et al., 2005). Research has been conducted in the UK exploring how trainee teachers, who are carrying out their

postgraduate certificate in education (PGCE), are prepared to support mental health needs. This research shows that trainee teachers continue to feel ill-prepared and under skilled, thus entering the profession with a lack of confidence in supporting the mental health needs of their students (Bostock et al., 2011).

With this drive for mental health support in schools, and teachers identifying their need for additional knowledge and strategies to recognise signs of mental health in students (Reinke et al., 2011), it is essential that the current research is reviewed for its quality and to identify if the results do show if there are any differences in how anxiety is experienced in secondary-aged pupils, and if interventions are effective in helping to alleviate this. Furthermore, an exploration of current research is required to understand how anxiety is manifested in CYP, what the influencing factors may be and how this is likely to impact learning and academic success. This will enable all professionals working with CYP in schools, to have a greater understanding of anxiety and how these can be best supported, through evidence-based practice.

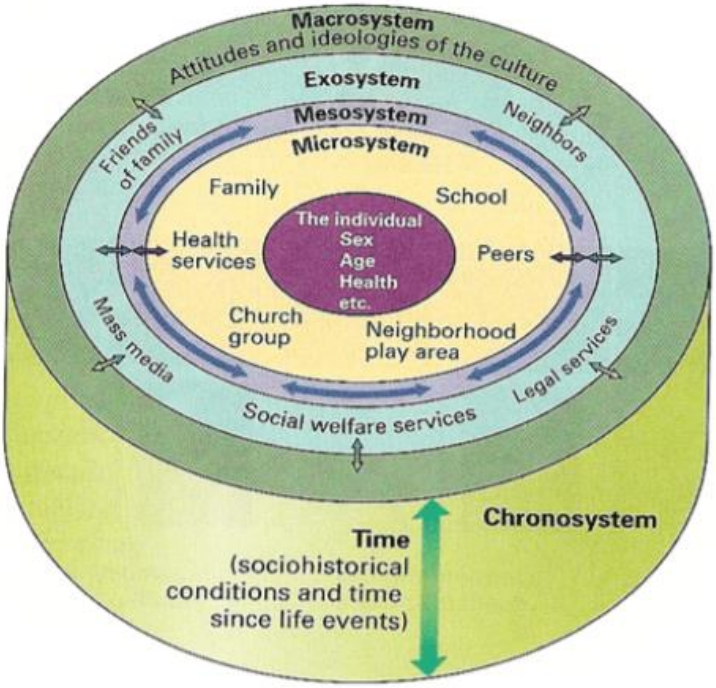
1.4 Relevance to EP practice

The role of the educational psychologist is to apply psychological theory and research to support CYP through promotion of not only their academic needs, but their emotional and social well-being (AEP, 2021; Department for Education & Department of Health, 2015). Furthermore, EPs are important in working collaboratively to promote a sense of inclusion, promote opportunities for academic success and to support positive social, emotional and mental health of CYP (Fallon et al., 2010). Recent literature proposes that EPs are becoming 'scientist-practitioners' by making use of relevant scientific methods, such as hypothesis, testing and validity checking to extend their knowledge base within the profession (Lane & Corrie, 2006).

As an EP, it is essential to work holistically and systematically to support CYP. An EP must understand a child or young person's human development in relation to the structures that make up their environment, in order to implement and provide an appropriate intervention or level of support. This is described as the ecosystem of human development (Bronfenbrenner, 2005) (Figure 1), which is an important theoretical framework. Understanding the development of anxiety within a child, begins by looking at the CYP's immediate setting such as their home or the classroom environment, known as the microsystem, before looking at the relationship between these settings; their mesosystem. Encompassing a child's system (i.e., ecosystems) that they are unaware of, is important in understanding the impact of genetics, familial make up and societal impacts such as SES on anxiety. In order to assess the impact of all systems surrounding the CYP (macrosystem), an EP must look at these together to not only understand the development of the child, but of the individuals supporting them, such as teachers, mothers, fathers, or siblings. These can all then be considered in providing the appropriate support. Amongst these it is also important to assess any ecological transitions that may also impact a CYP's development and onset of anxiety, such as moving to a new school, the arrival of a younger sibling or the separation of a family (chronosystem). It is with this knowledge that an EP can assess the support required for the individual either directly, or through supporting the systems surrounding them.

Figure 1.

Bronfenbrenner's Bio-Ecological Model (2005).



Morris and Atkinson (2018) propose that the role of the educational psychologist is to support CYP beyond education and to help promote positive self-identity, self-awareness, and resilience. An appreciative inquiry was conducted with EPs, which explored how students could be supported in further education (FE) colleges. Appreciative inquiry seeks to engage key stakeholders in identifying and exploring positive aspects within an organisation and the world around them, with the aim of building on these discoveries so a final goal can be achieved (Cooperrider & Whitney, 2005). This research identified that key areas of support were required for staff, with transitions and therapeutic work.

EPs are able to engage in different forms of interventions and approaches when working with schools and CYP e.g., solution focused approaches, person centred approaches and CBT. When discussing support for mental health, inclusive of anxiety, Brown et al. (2019) identified that support is more commonly available in secondary schools and delivered by EPs and counsellors. Cleave (2009) expressed

the importance for EPs to explore the teacher's perception of the child as well as exploring the familial history of need and the family make up. It is through this exploratory role that necessary information can be gathered to ensure appropriate and effective interventions can be put in place for the CYP. For example, if there is a view that there is underlying anxiety, it may be appropriate for an EP to put together a cognitive behavioural intervention which includes social skills training.

Pugh (2010) identified that the EP role involves statutory and systemic work, which can influence the way in which interventions are delivered. For example, one to one child and youth counselling, whole school training, direct delivery of psychological interventions and targeted with children, as well as leading multi-agency teams to support CYP's emotional health and well-being. This is, however, dependent on an educational psychology service's model of delivery i.e., traded or non-traded model, and the interpretation and value given to EP time that is not focused on statutory advice and assessments.

A survey of schools' work with child and adolescent mental health within the UK (Sharpe et al, 2016), identified that 81% of the specialist support related to mental health is provided by EPs. However, despite this there continues to be a lack of awareness from teaching professionals, parents and pupils, that mental health support lies within EP practice (AEP, 2017; Atkinson et al., 2014).

More recent research exploring the role of the EP in supporting CYP with mental health (Zafeiriou & Gulliford, 2020), suggests the need to support schools through policy development. The research highlights the significance of EPs as a resource to education staff, external agencies, as well as families. Specifically, the EP's role is to contain overwhelmed staff members by providing a secure base in which to express

their emotions. Furthermore, the EP engages adults in problem solving which is cognitively demanding, challenges their perceptions which help elicit cognitive and behavioural change (Zafeiriou & Gulliford, 2020). Thus, helping to engage in systemic change within the school.

Mental health needs have been identified as being associated with educational failure. With the declaration that supporting mental health is not just the responsibility of child and adolescent mental health services(CAMHS), and EPs placed at Tier 2 level for support within the CAMHS strategic framework (Department for Education Skills, 2004), it is not only important for EPs to be aware of how they can support the CYP within school, through early identification and interventions, but what may cause the onset of anxiety and who may be most affected.

As the new Mental Health Lead role in all schools, within England, falls to teaching staff, a systematic review has been established. This is required to provide teaching staff with an understanding of how anxiety is experienced in secondary-aged pupils, what may contribute to this and how these needs can be supported through interventions. A systematic literature review provides a clear, evidence-based understanding of how anxiety is experienced by secondary-aged pupils. In-addition it identifies the conditions under which interventions can be effective within school.

It is suggested that the Mental Health Lead role, “should be strategic, putting whole school/college approaches in place, ensuring a coordinated approach,” “oversees the outcomes of interventions on children and young people’s education and wellbeing,” and provides, “support to staff in contact with children with mental health needs to help raise awareness, and give all staff the confidence to work with young

people" (Department of Health and Social Care & Department for Education, 2018, pg. 21).

The results from the systematic review are intended to not only allow EPs to support Mental Health Leads and increase their confidence, but also to move away from a within child model of working, supporting teachers to adopt a holistic approach and to identify external factors that contribute towards anxiety.

With teachers specifying a gap in their knowledge in supporting student mental health (Bostock et al., 2011; Reinke et al., 2011), it is important that if teaching staff are promoted to support anxiety in CYP, following Government policies, they feel skilled and empowered with the knowledge to do so. As EPs are in the best position to support schools, particularly those working within a traded model of service delivery, this research will support their practice by providing a summary of evidence from existing research, which can be delivered via training or during consultations. Through dissemination of this research, teachers are able to reflect on the support offered to their pupils and identify reasons beyond the classroom, which may be contributing to a student's anxiety. This in turn will allow teaching staff to feel better equipped in identifying and supporting the needs of these pupils. Furthermore, as EPs, it is important that any recommendations made for interventions, are evidence-based and are planned appropriately. Through systematically reviewing existing research, this study will enable EPs to have a more in depth understanding of how interventions may be best suited in reducing anxiety symptoms in secondary-aged pupils and how these may need to be tailored to support more specific needs of students.

1.5 Thesis structure

Chapter Two will review relevant literature pertaining to anxiety, with the aim of providing an overview of the research area. This will conclude with a justification as to why a systematic literature review of anxiety in secondary-aged pupils, is required.

In Chapter Three the methodology will be explained, where details of critiquing tools will be provided, in addition to the eligibility criteria and research questions.

Chapter Four will provide the results, identifying the eligible studies following the systematic literature search, before describing and critiquing the literature in relation to the research questions.

Chapter Five will discuss the results, relating them to the literature review and identify conclusions made and ongoing debates.

Finally, Chapter Six will offer a conclusion and identify the implication for educational professionals, including EPs, before highlight gaps in research as well as the limitations of the review.

Chapter 2: Literature Review

2.0 Introduction

This chapter will present a review of the current literature of anxiety. Specifically, the literature will explore theories and models related to anxiety, before presenting research about the prevalence of anxiety in children and adolescents. This is inclusive of age and gender and contributory factors, such as working memory, socioeconomic status and family settings. Finally, literature exploring the impact of school-based and clinic-based CBT interventions will be presented.

To provide an understanding of anxiety, the chapter will first provide an overview of what anxiety is, before presenting definitions of anxiety that are most commonly found in secondary-aged pupils, as identified by NHS digital data (NHS Digital, 2018). The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association [APA], 2013) will be used to define the different forms of anxiety. Additional forms of anxiety that are not specifically identified by the DSM-5 will also be defined.

2.1 Literature review

2.1.1 What is anxiety?

Anxiety can be presented at varying levels and thus experienced differently. When presented at a low level, anxiety can be described as an emotional process that helps individuals deal with threat or danger and as a response to abstract or inexplicit stimuli. Joseph and Wood, (2010) suggest that anxiety is a continuum and that this can be evidenced through the use of self-assessment tools such as Spielberger's State-Trait Anxiety Inventory (STAI) (Spielberger et al., 1983) or the General Health Questionnaire (GHQ) (Goldberg & Williams, 1988), which contains the use of both positive and negative statements such as “I feel tense or wound up,”

or “I feel cheerful”. It is shown that to achieve the lowest score, individuals must select all positive statements, however this does not mean that there is an absence of anxiety; simply that anxiety exists at a far lower level that allows them to maintain a higher level of functioning. This was explored by Siddaway et al, (2018) who sought to establish whether a continuum of calmness-anxiety was apparent on the English version of the STAI. Two samples, using secondary data, were used in the study; Sample 1 was made up of 4,138 adolescents from Hawaii, aged 13-21 years, who took part in a 5 year longitudinal study between1991-1996. Sample 2 comprised of 1,824 British women aged 16-43, who were all pregnant. The latter were all recruited from within 60 miles of Cambridge, between 1990-1991 and information was gathered via telephone and mail interviews. The trait STAI was completed at 12 weeks of pregnancy, which assessed individual characteristics of feelings and thinking across similar situations. This was followed by the state STAI completed at 35 weeks and 6 weeks postnatal, which assessed the psychological and physiological state of the individual at a specific time.

Three models were analysed using a Confirmatory Factor Analysis (CFA); Model 1 which contained a standard two factor model involving separate negatively (‘anxiety present’ and positively (‘anxiety absent’) worded statements. Model 2 was a single factor model in which all items loaded onto a single factor. Finally, Model 3 featured a single calmness/anxiety factor which considered additional residual intercorrelation between positively worded item. An acceptable Root Mean Squared Error of Approximation (RMSEA) of ≤ .08 was identified and the findings suggested that rather than a traditional two factor model within both samples, a calmness-anxiety continuum was observed: .064 and 0.76 for both state and trait items within the British sample, and 0.54 within the trait items for the Hawaii sample. Thus, the

results showed that when a method sample bias is controlled, anxiety is experienced on a continuum and that there is a presence of calmness, rather than the absence of anxiety. Therefore, it is when the presence of calmness decreases and anxiety increases, that there is a need to support individuals in managing these feelings as the experience of a high level of anxiety, can cause impairment and disturbance to an individual's everyday life (Baldwin & Leonard, 2013; Noyes & Hoehn-Saric, 1998).

Whilst a range of ages, ethnicities and demographics were included in the secondary data, the study is not without its limitations. The study used only one scale to measure the continuum of anxiety and therefore would need to be replicated using a range of self-assessment tools to enable the results to be generalised. Furthermore, the data was taken from the 1990's which may not be reflect modern society and the increasing anxiety needs identified in CYP.

Findings from a study carried out in 2014, exploring the thresholds of GAD among US adolescents, supported the proposal that anxiety varies and lies along a continuum. Burstein et al, (2014) sought to explore the prevalence, and sociodemographic and clinical characteristics of the threshold and subthreshold forms of GAD and what differences were between them. Face-to-face surveys, using the World Health Organisation Composite International Diagnostic Interview Version 3.0, and fully structured interview of Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV) diagnoses, were conducted with 10,123 adolescents, aged between 13-18, within USA. The threshold for GAD was defined by the DSM-IV, whereby excessive anxiety and worry occurred for at least 6 months, pertaining to more than one event (GAD-6mo). Two subthreshold definitions existed: a) GAD-3mo, where the existing anxiety existed for 3 months; b) GAD-3mo/NOU, for which anxiety existed for 3 months but there was no level of uncontrollability.

The findings showed that 3% of adolescents met the threshold for GAD-6mo, compared to 5% who experienced GAD-3mo and 6.1% who experienced GAD-3mo/NOU.

With the inclusion of the subthreshold groups, the prevalence of anxiety was reported to have increased by 86.4%, showing that GAD is experienced at varying levels of severity amongst adolescents. Those who experienced GAD-6mo reported anxiety to be disabling in the moderate to severe range, with the inability to function for 7 days. The severity and impairment reported amongst the subthreshold groups were found to be slightly lower, indicating that although experienced at a greater level by those who met the threshold, GAD presents itself along a continuum.

Whilst important in further supporting the idea that anxiety exists on a continuum, the results should be considered with a level of caution. Firstly, the self-report of participants was done retrospectively and therefore retrospective reporting bias cannot be eliminated from the results. Furthermore, the results are limited to GAD experienced among 13-18 year olds in USA and therefore, cannot be broadly generalised to the global population or those outside this age range.

2.1.2 DSM-5 criteria of anxiety

The DSM-5 (APA, 2013) identifies 11 anxiety disorders which share features of excessive fear and anxiety and behavioural disturbances. These disorders differ from ‘developmentally normative fear’ or anxiety, in that they are excessive and persist for longer than would be expected, interfering with an individual’s daily living (APA, 2013). In addition to feelings of fear and anxiety, the DSM-5 specifies that an individual will also experience physical symptoms such as, irritability, difficulty sleeping, fatigue, restlessness, being on edge and muscle tension. Furthermore, the

DSM-5 states that varying forms of anxiety differ from one another based on the situation or object that causes feelings of fear, anxiety or avoidant behaviours. The 11 forms of anxiety identified by the DSM-5, are outlined in detail below.

2.1.2.1 Separation Anxiety Disorder

Separation Anxiety Disorder (SAD) is defined as an excessive or developmentally inappropriate fear or anxiety concerning separation from those whom the individual has an attachment to. The attachment figures are most commonly parents or family members, whom the individual fears losing the attachment to (Foley et al., 2004). Individuals believed to have separation anxiety must meet at least three sub-criteria to receive a diagnosis. The DSM-5 outlines that the feeling of fear, avoidance or anxiety is persistent and lasts for at least 4 weeks in children and adolescents under the age of 18.

Whilst the definition of SAD appears clear, two of the diagnostic criteria are the same as those identified for GAD. Therefore, the overlapping symptoms may prove difficult for professionals such as EPs and teaching staff to identify the correct form being presented (Mychailyszyn et al., 2012). Mychailyszyn et al. stated the importance of focusing on the underlying cause of anxiety, to avoid misdiagnosis. For example, if a child is anxious about being kidnapped, it should be explored whether it is the notion of being kidnapped that causes the anxiety or the result of being separated from their primary care giver that is the cause of anxiety.

In an educational setting, the most common cause of school refusal is association with separation anxiety (Olsen & Coleman, 1967) and the development of this anxiety is also likely to impact on the child throughout their life, as they grow older (Wilkerson, 1997). Bower (1964) supported this link between separation anxiety and

school refusal with the explanation that starting or going to school is a transition process in which the child must learn new rules and be apart from their caregiver in an unfamiliar environment.

Separation anxiety can occur at any time during childhood. It rarely presents during adolescence however this may be due to the change in the way it is behaviourally manifested at this age, causing under-detection (Allen et al., 2010). However, as parental reporting is more likely to result in a diagnosis, with parents more likely to report symptoms in their children, this may be an indication as to why more diagnoses are made for younger children, who would be unable to express their own views compared to adolescents (Allen et al., 2010; Foley et al., 2004). However, Foley et al. (2004) identified that SAD is a common disorder based on child-interview but not on parental interview, suggesting that as a child gets older, a parent is less likely to identify signs of SAD, which could also be attributed to the decrease in SAD diagnosis amongst adolescents.

2.1.2.2 Selective Mutism

The DSM-5 identifies selective mutism as a consistent failure to speak in a situation where it is expected, such as school or at social gatherings, despite the individual speaking elsewhere. This failure to speak is reported to have an impact on the individual's educational or occupational development or hinders social communication, occurring for at least one month. The DSM-5 clearly states that selective mutism is not a result of a communication disorder such as autism and is not attributed to a lack of knowledge or understanding of the language spoken in the social situation. The onset of selective mutism is usually before the age of 5, however it may not be detected until the child starts school.

Whilst the DSM-5 indicates that selective mutism can usually be detected once a child has started school, research by Kopp and Gillberg (1997) suggests that in the UK, only 3 out of 10,000 children are considered selectively mute, one year after starting school. In addition to this, an EP is likely to encounter a child who is selectively mute once every five years (Imich, 1998). However, a possible cause for a low prevalence of selectively mute children in school, could be due to the misinterpretation by teachers, that children who are mute are being defiant or rude, or that they may simply be believed to be shy individuals (Cline & Baldwin, 1994).

The DSM-5 does not identify any link between selective mutism and comorbid anxieties, however Kristensen (2000) found that of 54 children, 46.3% also had an additional anxiety diagnosis, most commonly social phobia followed by separation anxiety. This was supported by earlier research by Black & Uhde (1995) who proposed that not only do children with selective mutism have an additional anxiety, but that it should considered a symptom or subtype of social anxiety, rather than its own disorder. Therefore, it is important when an EP supports a child with selective mutism, that other forms of anxiety are also considered and explored.

2.1.2.3 Specific Phobia

Specific Phobia (SP) invokes immediate anxiety or fear which is provoked in association with a specific situation or object (e.g., bees, injections, heights), of which the individual actively avoids. The fear or anxiety felt by the individual is identified as typically lasting for at least 6 months and causes significant distress and disturbance to social, occupational or other areas of functioning (APA, 2013).

In an educational context, a child suffering with a specific phobia may manifest as school phobia, which can result in refusal to attend school (Kearney & Albano,

2018). Although dated, due to the lack of recent research, Waldfogel et al. (1957) suggested that school phobia presents itself in early school aged children who are mostly preadolescent females. Kahn & Nursten (1962) also indicated that a child with school phobia is likely to show symptoms of fear and anxiety, as outlined in the DSM-5.

2.1.2.4 Social Anxiety Disorder

Social Anxiety Disorder is defined as an intense fear or anxiety about a specific situation where the individual thinks they will be at the scrutiny of others, which results in them experiencing symptoms of anxiety. This in turn leads them to believe that they will then be judged negatively by others. For example, performing in front of a group, being watched when eating or meeting unfamiliar people in a social situation. This develops the belief that others will reject or distance themselves from the individual. The fear or anxiety felt by the individual is described as typically lasting for at least 6 months and causes significant distress and disturbance to social, occupational or other areas of functioning (APA, 2013).

In an educational setting, children with social anxiety are likely to find it difficult to make new friends and to meet new teachers, thus having an impact on key events such as transition to secondary school (Nowland & Qualter, 2020). Although representative of 10-11 year olds in Northwest England, research by Nowland and Qualter indicated that the higher the level of social anxiety, the higher the level of concerns relating to school and transitions. With limited research into the effect of social anxiety and social aspects of education, Nowland and Qualter highlight the importance of providing support and interventions for young people when transitioning to a new school.

2.1.2.5 Panic Disorder

A Panic Disorder (PD) involves panic attacks that are recurrent and unexpected. The DSM-5 describes a panic attack as “an abrupt surge of intense fear or intense discomfort that reaches its peak within minutes, during which time four or more symptoms occur.” (APA, 2013, pg. 208) PD differs from other forms of anxiety in that the individual experiences physiological symptoms which are bought on suddenly and are experienced more intensely. These symptoms include, but are not limited to, heart palpitations, sweating, trembling, shortness of breath and dizziness. At least one of the panic attacks is then followed by at least one month of persistent worries or thoughts about having another panic attack and/or behaviour that will avoid the onset of another panic attack such as exercise. The frequency of panic attacks varies depending on the individual. The DSM-5 highlights that a diagnosis of PD will only be given if the anxiety is experienced suddenly and there is an anxiety about the onset of future panic another panic attacks. Perugi et al. (1988) also proposed that panic disorders can lead to severe social agoraphobia as it results in the individual having anxiety and fear about having a panic attack away from home, thus avoiding going outside of the house. As with previously identified disorders, it is essential to consider additional forms of anxiety when working with individuals who may experience PD.

2.1.2.6 Agoraphobia

Agoraphobia is defined as a fear or anxiety of using public transportation, being in open or closed spaces, being outside of the home or standing in line or being in a crowded place (APA, 2013). An individual suffering from agoraphobia avoids these situations for fear that they will not be able to escape or will develop embarrassing or incapacitating symptoms. According to the DSM-5, the individual must present with

fear or anxiety of at least two of these situations to receive a diagnosis. These thoughts cause fear and anxiety that last for six months or more and cause disturbance to social, occupational or other areas of interaction through active avoidance.

2.1.2.7 Generalised Anxiety Disorder

Generalised Anxiety Disorder (GAD) is identified as excessive anxiety and worry that occurs more days than not, for at least six months, which are related to a number of events. In this circumstance, the individual finds it difficult to manage their worries which are associated with three or more of the following six symptoms; restlessness or on edge, being easily fatigued, difficulty with concentration or mind going blank, difficulty sleeping, muscle tension and irritability. The DSM-5 clearly states that these disturbances are not attributed to the physiological effect of substances such as drugs (APA, 2013).

Whilst previous literature has focused on the developmental differences between children with GAD, Jarrett et al. (2015) explored the associated symptoms of GAD and the implication this has on a child's learning. Comparing children aged 7-9-years and adolescents aged 10-13-years, Jarrett et al found that although still in the average range, older children tended to have a significantly lower IQ score compared to younger children, thus potentially impacting on their learning and academic ability. The findings also showed that older children had more school-based worry and more difficulty paying attention, however overall, there were not differences between younger and older children. Kendall and Pimentel (2003), however, reported finding that older children (11-13 years) had more associated symptoms that younger children (9-11 years). Although differing in their results, the

studies both indicated the importance for EPs to consider age in relation to the difference in associated symptoms with GAD.

2.1.2.8 Substance/Medication-Induced Anxiety

Substance/Medication-Induced Anxiety involves panic attacks or anxiety that develops soon after or during the use of substance intoxication, withdrawal or after exposure to medication. The diagnosis can only be made if the substance used is believed to be the cause of the anxiety or panic attack. Substances include but are not limited to alcohol, caffeine, cannabis, and cocaine (APA, 2013) .

2.1.2.9 Another Medical Condition

Anxiety due to another medical conditions is explained by the physiological effects of another medical condition. For example, endocrine disease, respiratory illness. These can cause an individual to become distressed about the meaning of consequence of a medical condition (APA, 2013).

2.1.2.10 Other Specified and Unspecified Anxiety Disorders

The final two forms of anxiety that are defined by the DSM-5 are known as ‘Other Specified Anxiety Disorders’ and ‘Unspecified’. These types of anxiety is defined as an individual who presents with symptoms characteristic of anxiety that causes a significant amount of distress or impairment to their social or occupational functioning but does not meet the criteria for any of the disorders mentioned previously (APA, 2013).

2.2 Additional forms of anxiety not identified by the DSM-5

Research also explores additional forms of anxiety that have not yet been identified by the DSM-5. These forms of anxiety are commonly education-based and referred to as test, mathematics and science anxiety.

2.2.1 Test anxiety

Test anxiety (TA) is referred to as a, “set of phenomenological, physiological, and behavioural responses that accompany concern about possible negative consequences or failure on an exam” (Zeidner, 1998 pg.17)**.** Lotz and Sparfeldt (2017) further identified test anxiety as presenting as forms known as trait or state. Trait test anxiety (TTA) is described as an individual’s disposition to interpret situations as threatening, compared to state test anxiety (STA) which is defined as an emotional state which is transitory and experienced in a specific situation.

The exploration of test anxiety has been ongoing for decades, with Mandler and Sarasan (1952) describing two different ‘drives’ in relation to a test situation. The first is described as a task-directed drive which stimulates the individual to engage in behaviours that will help to alleviate anxiety. The second is known as a learned anxiety drive that stimulates one of two behaviours; 1) an individual engages in task-relevant efforts to complete the test and therefore reduce the feeling of anxiety. 2) task-irrelevant or self-directed behaviours such as loss of self-esteem, heightened heartbeat, fear of punishment or a strong desire to escape the test situation.

In addition to these drives, Wren and Benson (2004) operationalise TA in children as having different dimensions; thoughts (i.e. worries about themselves and test-irrelevant thoughts), automatic behaviours (i.e. increased heart rate) and off-task behaviours (i.e. distracting and avoidant behaviours and nervous behaviours such as playing with their hair). Lowe et al. (2008) built on this theory further by identifying social and educational factors such as the influence of teachers, schools, parents and families that must be taken into consideration when exploring TA. Theories such as these indicate that test anxiety disturbs recall of prior knowledge and thus negatively impacting their performance (Hembree, 1990).

2.2.2 Mathematics anxiety

Mathematics anxiety, or maths anxiety, has been simply described as a subject-specific type of test anxiety, with the same constructs identified (Brush, 1981). This appears to be confirmed by more recent research which has found that the highest level of anxiety is heavily associated to unique maths elements such as problem solving (Joseph & Kaur, 2003). Furthermore, maths anxiety is defined as a feeling of fear, tension or apprehension that interferes with maths performance, which causes an individual to avoid daily situations that require maths skills (Ashcraft, 2002). The result of this avoidance strategy of highly anxious individuals, is lower maths competence and ability (Ashcraft, 2002; Hembree, 1990). Similar to test anxiety, environmental factors such as societal pressures and quality of social interactions with parents and teachers can influence the onset of maths anxiety (Foley et al., 2004).

2.2.3 Science Anxiety

Science anxiety is described as a negative fear of science material and the expectation to perform poorly. This fear can result in mental paralysis, anti-science attitudes, populations of adults who are scientifically illiterate, avoidance of science-based careers and the discomfort of doctors and nurses with machinery which assists in diagnosing illnesses (Mallow, 1978). The cause of this anxiety can be due to a number of stimulus such as poor past experiences in science class, science anxious teachers in school and gender and racial stereotyping (Bryant et al., 2013; Kastrup, 2016).

The research surrounding the three additional forms of anxiety highlights the need for EPs and education professionals to not only consider anxiety beyond that which is identified by the DSM-5, but also what the possible contributing factors may be.

2.3 Theories of the development of anxiety

Multiple theories and models exist in explaining how anxiety is formed or developed. However, Wells (1997) stated that there is no *single* theory or model that can explain anxiety. Within this literature review, three theories of anxiety, cognitive, control-value and conditioning theory, will be explored and critiqued, referring to research that has been conducted.

2.3.1 Cognitive theory of anxiety

Anxiety has been identified as causing physical and cognitive manifestations for an individual. Physical manifestations can range from feeling tense to feeling fearful, whilst a cognitive manifestation may be uncertainty at how to manage or cope with a certain situation, fear of embarrassment or anticipation of a negative experience (Noyes & Hoehn-Saric, 1998). In addition, anxiety can also cause autonomic manifestations in individuals which are common in severe anxiety. These are reactions that an individual's body produces automatically such as, a racing heart, bodily sweats, dryness of mouth, tightness of chest and feeling flush (Noyes & Hoehn-Saric, 1998). Furthermore, anxiety can cause behavioural manifestations which include tense facial expressions, strained voice, restlessness or crying (Noyes & Hoehn-Saric, 1998).

Although there are various cognitive theories, a common theme amongst them is that they all contain features of negative automatic thoughts (NATs) and the dysfunctional assumption of perceived danger through one's own beliefs (Wells, 1997); both of which will be explained in more detail.

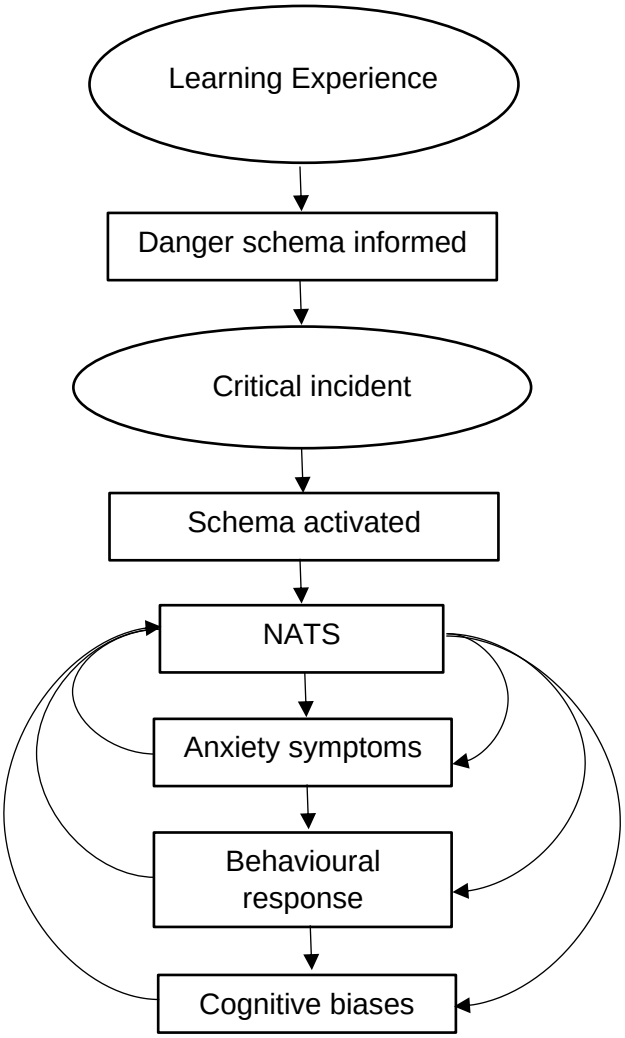
Beck et al. (1995) proposed that there are four functions to an individual who suffers with anxiety. The cognitive function relates to an individual's ability to think about a

situation which may lead to them having a clouded head or unclear form of thought, before developing into the affective function which elicit feelings, such as being irritable or scared. These thoughts and feelings cause an individual to automatically behave to a given situation. Most commonly this behaviour is in the form of ‘fight or flight’ and helps an individual to maintain their own safety. Finally, the anxiety impacts on an individual’s physiology and the organs react to the feeling of anxiety through heart palpitations, sweating or shortness of breath.

The four characteristics that make up the cognitive theory are, dysfunctional schemas, NATs, behaviour and cognitive biases, which are demonstrated in Figure 2.

Figure 2.

Generic cognitive theory of anxiety disorder (Wells, 1997).



Dysfunctional schemas are beliefs and assumptions held by an individual that are usually unrealistically high in standard for their own social performance, beliefs about how they feel they will be perceived by others and unconditional beliefs about themselves (Wells, 1995, 1997). For example, a dysfunctional belief could be, “I’m useless,” or “I’m worthless,” and an assumption would be, “If people see that I’m nervous, they’ll laugh at me or stop talking to me.” Neither one of these beliefs or assumptions are based on any evidence but simply the internal views of an individual.

A NAT is described as a sudden and automatic thought that occurs unconsciously and that the individual has no awareness of occurring. Beck et al. (1995) described this as something that is involuntary and can be repetitive, causing and individual to lose any ability to reason.

These dysfunctional schemas and NATs go on to reflect in an individual's conduct where they develop self-protective behaviours due to perceived threat or danger. For example, an individual who has a fear of having a heart attack when out in public, will avoid going out or leaving their house as this is believed to protect them from this occurrence (Wells, 1995, 1997).

Finally, cognitive biases cause an individual to have cognitive distortions about a situation including, catastrophising, magnification/minimisation and selective abstraction. These cause an individual to focus on the worst outcome and to focus on the negative aspects of a situation, whilst ignoring any positive events or outcomes. By focusing on these negative aspects, the individual is likely to ignore the more relevant or important features of a situation (Beck et al., 1995; Wells, 1997).

Wells and Carter (2001) sought to explore whether worries were maintained as part of negative self-thoughts and beliefs, as proposed by the cognitive model. To explore these, five groups containing 24 participants each were recruited which included patients with GAD, social phobia, panic disorder and major depression, as well as non-patients with no history of psychological treatment. Following completion of questionnaires containing self-report scales, the results showed that although patients with GAD had higher rates of negative self-belief, all of those with a diagnosis showed a high level of negative self-beliefs, compared to the control

group. Thus, providing support that negative self-thoughts and beliefs contribute to anxiety that are often not the result of a particular event. In addition, the exploration of multiple anxieties rather than one, offers an insight into how negative self-thoughts impact anxiety in general.

Stopa and Clark (2000) also explored the cognitive model, focusing on negative interpretations of ambiguous events and interpreting mildly negative situations, catastrophically. Conducted in the UK, Stopa and Clark found that participants with social phobia and those with other forms of anxiety, were significantly more likely to interpret situations negatively (Amin et al., 1998), believe negative interpretations of an event and catastrophise mildly negative situations, supporting another element of the cognitive model of anxiety.

Expanding on these findings McManus et al. (2000) reported that individuals with social phobia had higher levels of cognitive biases in relation to the probability and cost of a negative social situation, compared to others with a diagnosis of an alternative anxiety. These findings however should be interpreted with caution as self-report scales were tailored to include more severe statements which would be more relevant to patients with social phobia. Thus, statements may not have been relevant to those in the study with OCD and therefore not reflective of the level of their own negative thoughts.

2.3.2 The Control-Value Theory

A more recent theory, developed by Pekrun (2006), suggests that two types of appraisal contribute to the development of anxiety; subjective control and subjective values. Subjective control refers to an individual's perceived control over the achievement of activities and their outcomes (e.g., revision will lead to a good grade

in exams). Subjective values refer to the perceived importance of an action and the outcome (e.g., the importance of success). Within subjective control, the relationship of expectancies and attributions to achievements and their outcomes are considered to be important. Causal expectancies are prospective thoughts addressing the relationship between causes and future outcomes, such as effort made towards learning and the outcome in an exam. Causal attributions are thoughts pertaining to the causes of an effect, such as the reasons for a success on a recent exam.

Both control and values are proposed to be important in the development of anxiety, however Pekrun emphasises that it is prospective thoughts that are of significance. For example, if an individual believes that their peers will laugh at them if they perform in the school play or that they will not cope at school if they leave their primary caregiver, this can lead to the onset of anxiety. Therefore, without this level of control over the outcome of a situation, the development of anxiety is likely to increase.

This was explored by a recent study conducted by Boehme et al. (2017) who sought to understand the relationship between test anxiety in 356 5th grade German pupils, and their own control and value cognitions. In addition, parental values of maths and test anxiety were also assessed. Data measuring self-concepts of control and values were gathered using a variety of questionnaires, which were distributed to both mothers and pupils. The results indicated that there were statistically significant effects of the predictors of family values, academic self-concept (control cognitions) and academic interest (value cognitions) on test anxiety. Higher family values and high academic interest resulted in higher levels of test anxiety whereas higher academic self-concept led to lower levels. Thus, supporting Pekrun's theory that a

lower sense of control and higher values increased the level of anxiety experienced by an individual.

However, these results should be viewed with some caution as the study relied on the values of mothers and did not include fathers, thus assuming that this was the only parental factor that impacted on anxiety levels. The results also assumed control and values to be directly correlated to test anxiety, however, did not consider or control variables such as academic ability. Finally, the study only explored 5th grade pupils in Germany and therefore the results and application of the theory cannot be generalised to all CYP. Whilst offering an insight into the impact of control and values on anxiety, as there are few studies which explore this relationship, further research is required to establish its significance.

2.3.3 Conditioning theory

The conditioning theory offers an alternative explanation of anxiety, proposing that the cause of anxiety is the effect of conditioning e.g., the change in behaviour due to pairing of stimuli, or the effect of a mediating mechanism e.g., associations of a stimuli that are associated to one's memory (De Houwer, 2020; Delgado et al., 2006).

The earliest evidence to support the belief that the pairing of stimuli causes anxiety was the manipulation of 'Little Albert', who became fearful and anxious at the presentation of a neutral stimuli, a white rabbit (conditioned stimuli) when paired with an aversive stimulus, a loud noise (unconditioned stimuli) (Watson & Rayner, 1920). Through repeated associations between the white rabbit and the loud noise, a conditioned response (CR) of anxiety and fear was elicited from Albert.

Expanding from earlier experiments such as Watson and Rayner, a theory of fear acquisition was developed (Rachman, 1977) incorporating additional elements. This theory proposed that fears and anxieties could be acquired through three different ways; direct conditioning, vicarious learning and information or instruction i.e., a neutral stimulus which is associated with fear or the acquisition of pain, which goes on to develop fearful qualities and thus become a conditioned stimulus. Rachman also stated that these reactions could be produced readily through the use of conventional conditioning methods. However, the results from this experiment should be viewed with some caution as they were reflective of laboratory animals rather than human participants.

Research has, however, been conducted with human participants to provide further evidence of the conditioning theory. In an early experiment, Hygge and Ohman (1978) found that participants were conditioned to feel fear towards a fear evoking stimulus, vicariously. Participants were shown conditioned stimuli (CS+) in the form of fear relevant (snakes, rats or spiders) or control stimulus (CS-) in the form of a fear irrelevant (flowers, mushrooms or berries) and paired with a 'model' participant who described an incident related to either CS+ or CS-. Participants skin conductance was measured which resulted in a significant increase after seeing the model's reaction to a stimulus. Thus, indicating that human fears and anxieties can be vicariously conditioned.

These results were confirmed in a later study by Olsson and Phelps (2004) who sought to compare fear learned through direct experience (Pavlovian) and fear learned through non-direct experience (observational learning or verbal instruction learning). Randomly assigned participants either received shocks when shown a conditioned stimulus, observed a participant receiving an electric shock when shown

conditioned or neutral stimuli, or instructed that they would receive shocks at a later stage of the experiment; apart from the initial group, no shocks were administered. The results showed that participants in the Pavlovian and observational group had greater skin conductance rates (SCR) to CS+, indicating that pairing of stimuli can result in anxiety being a learned conditional response.

Whilst both studies present evidence for the theory that anxieties are learned through conditioning, due to the laboratory conditions in which they were carried out, they lack external validity which means they cannot be applied to the real world. In addition, the experiments were conducted with adult participants and therefore do not offer an insight into the development of fears and anxieties in children. Further research is required to understand how conditioning can impact the development of anxiety in children and adolescents.

Rachman's expansion on the theory of conditioning (Rachman, 1977), offers an explanation as to why fears and anxieties develop in individuals when presented with stimuli or a past learning experience such as separation anxiety or fear of spiders. The explanation proposes that any neutral stimulus that makes an impact on an individual, that happens to evoke a fearful response at the same time, is given the power to evoke the same fear thereafter. However, the theory fails to explain why these fears and anxiety develop slowly over time, when one has not been presented with a learning experience for example, the fear of self- harm or heights (Ollendick & King, 1991; Rachman, 1977). Additionally, the theory can be challenged in that not all individuals develop fear or anxiety in the presence of fear relevant stimuli, such as the exposure to loud, explosive noises (Rachman, 1977). This was supported by Field et al. (2001) who reported that children aged between 9-14 years who had higher level of fear, were more likely to identify a specific source of fear acquisition

e.g., modelling, direct conditioning, or instruction/information. For example, 70% of those who had a fear of not breathing, had previous experience of an asthma attack, or waking up and not being able to breathe. However, 30% of children who had experienced the same stimulus did not report a fear of not being able to breathe, thus indicating that conditioning alone does not explain fears and anxieties.

In addition, when fears and anxieties are acquired through information or instruction, the level of fear is dependent on the source of information (Field et al., 2001). In a further experiment, Field et al used one of three informers to tell different groups of children aged 7-9 years stories about two dolls. The informers were the children's teacher, their peer, or an adult stranger (experimenter). The level of fear was recorded before and after the stories and the results indicated that children had a higher level of fear when told information by a teacher or adult, compared to a peer, who had little impact on the children. Thus, indicating that not all information or instructions lead to the acquisition of fear or anxiety.

Harari et al. (2013) proposed that a vast amount of literature existed which indicated that maths anxiety in older children was a multidimensional construct including numerical anxiety, test anxiety, worry and negative reactions. The 2013 study sought to specifically determine whether maths anxiety in first-grade participants was a unidimensional construct or multidimensional and if these constructs were similar to those experienced by older individuals.

Exploring maths anxiety behaviours and feelings in 106 participants using the Maths Anxiety Scale for Young Children, Harari et al reported that participants displayed a moderate level of anxiety and, that participants experienced this as multidimensional constructs, which were both significantly related to each other ($p < .001$);

emotionality and worry. Whilst not composed of the same components as older children, the results indicate that younger pupils also experience maths anxiety as a multidimensional construct.

However, the majority of participants in Harari et al's study, were also language minority learners (57.5%) which meant they were not native English speakers. Therefore, as the Maths Anxiety Scale for Young Children, relied on pupils reading and understanding statements in English, it is not made clear the participants ability to understand and interpret these or if any translation was offered. The study also overrepresented females with only 45 males compared to 61 females, which indicates that the results may be reflective of one gender. Furthermore, maths anxiety is not yet defined as an anxiety disorder and therefore the results cannot be used to confirm the current data available as it is not included within it.

It is important to consider the cognitive theory when assessing or working with children or young people with anxiety, so that historical events can be explored to possibly attribute the onset. It is also equally important to bear in mind that this theory cannot solely explain the attribution of anxiety to a stimulus.

2.4 Prevalence of anxiety

Research has shown that anxiety is likely to be the most common disorder in childhood (Cartwright-Hatton et al., 2006), with retrospective studies identifying that adults with anxiety reported the onset of the disorder during childhood, or at the latest, adolescence (Kim-Cohen et al., 2003). Furthermore, three quarters of anxiety disorders are reported to have their origins in childhood (Griffiths & Fazel, 2016) with one in eight children and young people reported to receive a diagnosis for anxiety, in their childhood (NHS Digital, 2018).

2.4.1 Data reflecting the prevalence of anxiety in CYP

Data from the National Health Service (NHS) Digital (2018) reported the prevalence of anxiety in childhood and early adolescence, in addition to the prevalence in males and females. Table 1 provides data of the prevalence of anxiety in 5–10-year-olds and Table 2 provides data of 11-16 year olds.

Table 1.

Data of the prevalence of anxiety in males and females aged 5-10 years, between 1999 and 2017 (NHS Digital, 2018).

	Males		***Females***		***All***	
Anxiety diagnosed	*1999*	*2017*	*1999*	*2017*	*1999*	*2017*
All anxiety diagnoses*	3.3%	4.4%	3%	3.4%	3.1%	3.9%
Separation anxiety disorder	1%	1%	1%	1.1%	1%	1%
Specific phobia	1.1%	0.6%	0.9%	0.9%	1%	0.8%
Social phobia	0.4%	0.2%	0.2%	0.2%	0.3%	0.2%
Panic disorder	-	0%	-	-	-	0%
Agoraphobia	-	0%	-	-	-	0%

Generalised anxiety disorder	0.3%	1.2%	0.4%	0.2%	0.4%	0.7%
Other anxiety**	1%	1.5%	0.5%	0.9%	0.8%	1.2%

**For the purpose of this paper, post-traumatic stress disorder and obsessive-compulsive disorder have not been included in the statistics, which were part of the original data, as these are not identified by the DSM-5 as anxieties.*

***It is not known which anxieties fall under the 'other anxiety' category. Therefore, it is assumed that this includes the remaining anxieties identified in the DSM-5.*

As can be seen from Table 1, data gathered between 1999 and 2017 shows an overall increase in the number of children aged between 5 and 10, who received a diagnosis of anxiety, from 3.1% to 3.9% (NHS Digital, 2018). When broken down by gender, the data shows a greater increase in the number of males with a diagnosis between these years than females, who none the less, show an increase in diagnosis also. Between 1999 and 2017, the number of males diagnosed with a anxiety increased from 3.3% to 4.4%, with a diagnosis in females increasing from 3% to 3.4% (NHS Digital, 2018). It should, however, be noted that the overall figures contained statistics for obsessive compulsive disorder and post-traumatic stress disorder, which are not identified within the DSM-5 (APA, 2013).

When looking at the specific categories of anxiety, the overall diagnosis of separation anxiety disorder remained at 1%, however both specific phobia and social phobia indicating a slight decrease in diagnosis made, falling from 1% to 0.8% and 0.3% to 0.2% respectively (NHS Digital, 2018). The statistics indicate that within

England, a diagnosis of panic disorder and agoraphobia was not made in 1999, only being recognised in 2017.

Finally, generalised anxiety disorder and other anxiety increased in diagnosis from 0.4% to 0.7% and 0.8% and 1.2% respectively (NHS Digital, 2018).

Table 2.

Data of the prevalence of anxiety in males and females aged 11-15 years, between 1999 and 2017 (NHS Digital, 2018).

	Males		***Females***		***All***	
Anxiety diagnosed	*1999*	*2017*	*1999*	*2017*	*1999*	*2017*
All anxiety disorders*	4.1%	6.1%	5%	8.3%	4.5%	7.1%
Separation anxiety disorder	0.6%	0.9%	0.3%	0.5%	0.5%	0.7%
Specific phobia	0.7%	0.9%	1%	1.1%	0.9%	1%
Social phobia	0.4%	0.7%	0.4%	0.8%	0.4%	0.8%
Panic disorder	0.4%	0.6%	0.3%	1.6%	0.3%	1.1%
Agoraphobia	0.1%	0.2%	0.2%	0.7%	0.1%	0.5%

Generalised anxiety disorder	0.8%	1%	0.9%	1.8%	0.8%	1.4%
Other anxiety**	1.4%	1.2%	2.1%	2.2%	1.8%	1.7%

**For the purpose of this paper, post-traumatic stress disorder and obsessive-compulsive disorder have not been included in the statistics, which were part of the original data, as these are not identified by the DSM-5 as anxieties.*

***It is not known which anxieties fall under the 'other anxiety' category. Therefore, it is assumed that this includes the remaining anxieties identified in the DSM-5.*

As with children aged between 5 and 10 years, Table 2 identifies that data gathered also shows an overall increase in children aged between 11 to 15 years with a diagnosis of anxiety from 4.5% to 7.1%. As with the statistics representing younger children, these overall figures also contain statistics for obsessive compulsive disorder and post-traumatic stress disorder, which are not identified within the DSM-5.

When analysed by gender, data indicates that whilst there was an increase in diagnosis made for males (4.1 % to 6.1%), there was a much larger increase in the number of females receiving a diagnosis of anxiety; from 5% to 8.3%. It would appear that this was due to a shift in the diagnosis from younger males with generalised anxiety, to older females. Additionally, the increase in anxiety amongst older females may have been attributed to the fact that panic disorders were recognised in older children, being more prevalent in older females than males. As mentioned, panic disorders can lead to agoraphobia, which appears to be reflective

in the statistics of older females with panic disorders and agoraphobia; 1.6% and 0.7% compared to 0% in those who are younger.

Whilst there was an increase in the number of young people who received a diagnosis of separation anxiety, specific phobia, social phobia, agoraphobia and post-traumatic stress disorder, the largest increase in diagnoses received were for panic disorder and generalised anxiety; (0.3% to 1.1% and 0.8% to 1.4% respectively). This increase in diagnoses reflects that anxiety is likely to be experienced by older pupils more greatly than younger peers.

A survey conducted by the Association of Colleges (AoC) appears to support this data (AoC, 2017). 105 FE colleges, in the UK, participated in the study which found that 85% of respondents perceived there to have been an increase, in the last three years, in the number of students with mental health needs. Of these, 99% reported having students who were diagnosed with severe anxiety, with only 40% of colleges feeling able to provide full-time counselling or mental health support for students. Thus, indicating that although anxiety continues to increase with age, colleges are likely to feel under skilled to support students.

2.4.2 Studies exploring the prevalence of anxiety in CYP

Studies have sought to explore the prevalence of different forms of anxiety in children and adolescents and explored common prevalence rates depending on age and gender.

When exploring the prevalence of anxiety amongst children and adolescents in Great Britain, according to the earlier DSM-4 criteria, Ford et al. (2003) conducted a large national population based survey of 10,438 children aged between 5 and 15 years. Children were assessed using the Development and Well-being scale (DABA)

following interviews with parents, teachers and children aged 11-15 years. Although this scale was developed for this study, diagnoses were assigned according to the DSM-4 criteria. The authors found that the prevalence of disorders increased with age with 3.19% of 5-7 year olds receiving a diagnosis compared to 5.04% of 13-15 year olds. However, this may have been due to the fact that older children are able to verbalise their anxiety over younger children and are more aware of their own thoughts and have an 'increased cognitive sophistication' (Griffiths & Fazel, 2016).

Ford et al (2003) also reported that males and older children were more likely to have a non-operationalised disorders and that what would typically have been expected in regard to behavioural traits of anxiety, were recorded. For example, disruptive disorders were prevalent amongst males, whereas disorders such as eating disorders, were prevalent amongst females.

The prevalence of anxiety amongst females was found to be higher (4%) compared to that amongst males (3.5%) (Ford et al., 2003). This was supported by further research which indicated that females were more likely to have difficulties with anxiety and difficulties regulating their emotions than males (Bender et al., 2012; Costello et al., 2003) and that anxiety peaked in adolescence and was more prevalent in females, even from an early age (Field et al., 2001; Zahn-Waxler et al., 2008). These findings were also supported by the data from the NHS in females aged 10-15 years of age. However, for younger children aged 5-9 years, the prevalence was reported to be higher in males, rather than females.

Additionally, a predictor of anxiety in females has been argued to be due to a lack of emotional regulation strategies and lack of emotional clarity compared to males, where a predictor of anxiety is likely to be due to a lack of acceptance to negative

emotions (Bender et al., 2012). Thus, females are likely to show as much turmoil as males, however they may be likely to demonstrate their feelings in a way that is believed to be more appropriate in their behaviour. For example, when feeling anxious rather than expressing their feelings through physical aggression (Emery, 1982; Zahn-Waxler et al., 2008). The presentation in different behaviours could be attributed to the CYP trying to establish their own self-concept as they see is appropriate to their gender (Krapp, 2000), thus engaging in different internal and external behaviours. This highlights the possible differences in the presentations of anxiety between both genders.

Whilst the study by Ford et al (2003) provided information regarding the prevalence of anxiety amongst children and adolescents, the study only looked at those up to the age of 15. Therefore, the study does not reflect the prevalence of anxiety of all school-aged children. It could be argued that exams (e.g., GCSE's and A-Levels) towards the end of primary school and into further education may increase symptoms for those that are predisposed to anxious thoughts and feelings.

Consideration should also be given to the impact of information provided by teachers. Ford et al (2003) reported that clinical diagnoses increased for children with disruptive disorders when teacher information was provided in addition to parent and child information. This may be due to the fact that young people and parents may not always recognise characteristics or the presentation of behaviours as anxiety or may be reluctant to do so (Griffiths & Fazel, 2016). With one fifth of teachers not providing information in the study, it could be argued that the prevalence rate may not have been truly reflective of the population. The study not only raises the difficulty in recognising anxiety, but also the importance of multi-informants when assigning a diagnosis to a CYP. A lack of information, as in this

study, can be the result in a child not receiving a diagnosis or being recognised as having a need, which can then be supported in an educational environment.

It should also be noted that the sample, at the time of the study by Ford et al, represented the population of ethnic minorities according to the 1991 census (8.7%) and therefore it would be beneficial to understand the prevalence of anxiety amongst school-aged children with a representative sample of the current ethnic minority population.

The Great Smoky Mountain Study (GSMS) (Costello et al., 2003), which was carried out in western North Carolina, United States of America (USA), challenged Ford et al's (2003) findings that anxiety increases with age. Costello et al's findings indicated that the prevalence of any form of anxiety was at its highest at the age of 9-10 (4.6%) with a decrease at 16 years of age (1.6%). Whilst the study offered an insight into the difference in prevalence in countries across the world, consideration should be given to the fact that the GSMS study was a longitudinal study of 9-16 years olds within western North Carolina, between 1993 and 2000, which was not representative of cultural differences in Great Britain.

An additional explanation for the increase in the prevalence of anxiety as children get older, could have been due to an upcoming transition between schools. Typically, in the United Kingdom, children move onto secondary school at 11 years of age. Lester et al., (2019) sought to identify if anxiety decreased following a transition to a new school. Collecting data from 109 mainstream primary children in year 6 from schools in Greater London, pupils were provided with various questionnaires to identify anxiety characteristics, secondary school concerns and views on school transition. Follow up questionnaires were issued at the end of the pupil's first term of secondary

school, where responses indicated that pre-transition scores for anxiety and school concerns were 0.5 standard deviations (SD) above reported norms, with 106 pupils with anxiety. This then fell to 0.25 SD below reported norms post-transition, with 76 pupils with anxiety, indicating that transitioning to a new school can be a trigger of anxiety for children, before reducing at a later stage when they are able to adapt (Rice et al., 2011). Whilst a reduction in anxiety was found after secondary school transition, the research suggests that anxiety can continue post-transition, indicating that anxiety symptoms can predict later symptoms (Lester et al., 2013; Zeedyk et al., 2003). It is therefore important that educational professionals, including EPs, support children with transitions into secondary schools and continue support for those pupils who may be vulnerable.

2.5 Associations between family factors and anxiety

2.5.1 The link between parenting and anxiety in CYP

Emery (1982) identified that children who witness hostile conflict resolutions, experience inconsistent disciplinary actions between parents and are exposed to a stressful environment thus developing their own 'problem' as a way to distract from the parental conflict (e.g., becoming anxious and withdrawn to move the focus onto themselves), are more likely to have a diagnosis of an anxiety.

These results are supported by a more recent study by Draisey et al. (2019) who recruited 210, 7-12 year olds and their primary caregivers, to identify if specific types of anxiety (e.g. social anxiety disorder, separation anxiety disorder and generalised anxiety disorder), were associated with particular forms of psycho-social risks; chronic childhood adversity, negative life events, and particular forms of parenting behaviours. A range of related questionnaires were administered to the mothers and children in the study, in addition to observing mothers' behaviours and rating how

they interacted with their children. Levels of childhood anxiety were also observed and coded. Although only three specific forms of anxiety were explored, the study identified that there were no significant differences between the sub-categories and maternal ratings of neighbourhood adversity (indicating crime and disorderly conduct) was not found to be associated with a child's likelihood of having anxiety.

However, the data did reveal that whilst there were no significant differences in family SES, children with separation anxiety were more likely to come from a single parent home compared to children without separation anxiety. Mothers of children with separation anxiety also reported significantly higher frequency of negative life events than those with children without separation anxiety, indicating that negative life events may have an effect on a child's likelihood to have anxiety. Furthermore, mothers of children with generalised anxiety disorder were more likely to report that their child had experienced a family bereavement than those with children without, leading to inference that a significant family event can be associated with or be a trigger for this type of anxiety. Additionally, children with separation anxiety are reported to experience more negative life events than peers without separation anxiety. Therefore, indicating that it is important to consider a CYP's family unit and background when exploring anxiety.

Further research by Hudson et al. (2019) explored the association of maternal anxiety, maternal overinvolvement and maternal protection with child anxiety. Pre-school children's baselines were assessed at 2 years old, 5 years old and 8 years old. Children were assessed as presenting with behavioural inhibition (BI) e.g., wariness, avoidance or shyness in familiar behaviour. Those who were not assessed as BI were assessed as behaviourally uninhibited (BUI). The results indicated that BI children had a higher anxiety score at the age of 4 compared to BUI children,

indicating that those presenting with inhibiting behaviours at a young age have a higher prevalence of anxiety.

When assessing maternal anxiety and maternal negativity, the results indicated that there was a significant impact on their child's likelihood to receive a diagnosis of anxiety. Additionally, a high level of maternal overinvolvement had a significant impact on anxiety over time, with children having a low baseline score at 2 years of age which increased with age; results which are supported by alternative studies (Bruggen et al., 2008; McLeod et al., 2007).

As the study by Hudson et al is longitudinal, it allows the data to represent the ongoing experience of children as opposed to a retrospective view. However, the study focuses only on maternal involvement and the impact on a child's diagnosis of anxiety. Research has shown that paternal relationships and parenting behaviour is likely to result in lower chance of their child having childhood anxiety, compared to maternal parenting behaviour (Lazarus et al., 2016). Therefore the exclusion of fathers in the study may have resulted in the higher prevalence of anxiety in children with BI compared to BUI children (Lazarus et al., 2016).

In research where parents are relied on to provide information, care should be given when interpreting the results. When a diagnosis is based on the report of a parent, this may contain a chance of misinterpretation of behaviour. For example, a parent may mistake SAD for a phobia, or anxiety may be misinterpreted as depression. It is also likely that the gender of the parent reporting behaviours may not identify or view them as significant, with fathers being less likely to report behaviours as significant compared to mothers (Foley et al., 2004).

Studies have also shown that children and adolescents with a diagnosis of an anxiety, are likely to have a comorbid diagnosis. For example, children with a diagnosis of depression are most likely to have an additional diagnosis (66%) compared to children with a disruptive diagnosis (21%). Additionally, 27% of children and adolescents diagnosed with a anxiety had comorbid depression or a disruptive disorder (Ford et al., 2003). This research highlights the importance of considering a CYP home environment and factors that may possibly be associated with the development of anxiety.

2.5.2 The link between siblings and anxiety

Studies exploring the link between siblings and anxiety are important, particularly for EPs, as it helps to understand external contributing factors of anxiety when working with CYP. Working with families, it is essential to understand how this may impact on the development of anxiety. However, studies are limited in exploring the link between siblings and anxiety, with focus on externalising and internalising behaviours. Continuities in a child's unfriendly behaviour towards their sibling and their own later externalising behaviours have been reported (Campbell & Ewing, 1990)**.** Amongst other factors, a longitudinal study by Dunn et al (1994) explored individual differences in internalising and externalising behaviour to children's sibling relationships. 80 children from 40 families aged 8-10 years, who had previously been involved in a study in 1987, took part in the follow up study. To explore the sibling relationship, one home visit was conducted in addition to assessments and interviews with mothers and children at three different times. Results indicated that at the age of 5 years, negative relationships with a younger sibling correlated with internalising behaviours seven years later (maternal interview). Relationships at the age of 10 however, indicated higher levels of externalising behaviours. More

specifically, it was found that younger siblings who had a negative relationship with their older sibling was linked to fearful, overanxious and controlling behaviour.

Whilst results suggest that negative relationships lead to anxiety in younger siblings and earlier negative relationships lead to later externalising behaviours in older siblings, the results should be considered with a level of caution before being generalised. Only families with two children were assessed in this study and therefore consideration was not given to children with two or more siblings and the impact of this on anxiety.

Although correlations were reported between siblings and behaviour, the study does not eliminate the possibility of the impact of additional variables such as SES or single parent families and therefore results cannot be generalised to all sibling relationships.

A more recent study by (Lindhout et al., 2003) sought to explore the perceived affection and hostility between peers of anxiety disordered children (8-13 years) compared to non-anxiety disordered children (7-13 years) in the Netherlands.

24 children took part in the study with varying diagnoses of anxiety: overanxious anxiety disorder, generalised anxiety disorder, separation anxiety disorder, social phobia or panic disorder without agoraphobia, according to the DSM-3-R criteria. Children and their parents completed the Anxiety Disorders Interview Schedule for DSM-IV, Child and Parent Versions (ADIS-C/P) and The Sibling Relationship Inventory (SRI). The results indicated no significant difference in the perception of hostility or affection between the anxious and non-anxious groups, suggesting that this relationship does not have an impact on anxiety levels within individuals.

Similarly, to Dunn et al. (1994) study, consideration should be given when interpreting these results. 24% of participants invited to (Lindhout et al., 2003) study did not respond and therefore resulted in a small sample size of just 24 participants. Therefore, a larger sample size may have provided additional data and provided a more generalisable result. The conflicting results from the studies identify, highlight the need for further exploration into the impact of sibling relationships on anxiety. As with parenting factors, this is of great importance to consider, when working with a CYP experiencing anxiety.

2.6 Anxiety and academic achievement

2.6.1 Implications of anxiety on educational attainment

Studies carried out in New Zealand, United States and Norway, have shown that anxiety is a significant predictor of an individual's likelihood to complete school and university and to enrol into higher education (Fergusson & Woodward, 2002; Kessler et al., 1995; Melkevik et al., 2016).

Kessler et al (1995) conducted a national survey in the United States, of 5,877 respondents, to assess the social consequences of psychiatric disorders, including anxiety. Respondents comprised of parents and children who were interviewed to gather data, comparing the age of onset of each disorder with information on educational attainment. The findings indicated that the percentage of the population with anxiety who did not complete secondary school was 4.1%, with a higher prevalence in females than males (5.4% and 2.9%). Results also indicated that individuals with anxiety were less likely to complete secondary school compared to other disorders, such as mood or conduct disorders. These findings are supported by a study conducted by Melkevik et al (2016) in Norway, who reported that lower educational attainment and delayed completion of school in individuals was due to

significantly higher symptoms of anxiety and depression indicating that anxiety can impact academic completion similarly across the globe.

Whilst the results are useful to show the impact of anxiety on the likelihood of completing school, both Kessler et al (1995) and Melkevik et al (2016) studies included participants in adulthood and required them to look retrospectively and recall the onset of their disorder, thus relying on memory. Therefore, more prospective research is required to understand the impact on academic completion, to remove any potential errors in memory.

Fergusson and Woodward (2002) conducted a longitudinal study in New Zealand, with participants aged 14-21 years, collecting data as the participants grew older, thus eliminating the need for retrospective data. Data gathered included participants educational attainment, the onset of their disorders and social, familial and personal factors. The findings indicated that those with anxiety were at significant risk of later educational underachievement such as school failure or reduced likelihood of enrolling in further education, which also support Kessler et al (1995) and Melkevik et al (2016). Whilst these findings help to support the indication that anxiety can result in a risk to an individual's academic achievement by removing retrospective memory, research is required in the United Kingdom as to the causation of anxiety and education attainment.

More recent studies have also explored the impact of anxiety on education, specifically mathematics. One study found high levels of maths anxiety to be inversely correlated with mathematical outcomes; computation skills ($r = –.30$, $p = .002$), counting skills ($r = –.28$, $p = .004$), and math concepts ($r = –.35$, $p < .001$) indicating that the lower the skill level, the higher the level of anxiety experienced. An

inverse correlation was also found between maths anxiety and attitude towards maths ($r = –.62$, $p < .001$), indicating that a lower attitude towards maths is likely to result in an increase in maths anxiety (Harari et al., 2013).

A regression model further supported these findings, identifying statistical significance in computation skills (p=.04); counting skills (p=.03); maths concepts (p= <.001) and attitude towards maths (p= <.001). In addition, Harari et al explored the relationship between maths anxiety and language status. The results of the independent t-test showed that language status had no impact on maths anxiety, indicating that a lower skill level and attitude towards maths results in higher anxiety alone.

These findings were supported by Jarett et al. (2015), who reported that younger children, who generally had lower levels of anxiety symptoms were happier ($t(39) = 2.54$, $p< .05$) and had significantly fewer problems with learning ($t(37.96) = 4.01$, $p<.05$). This supports Harari et al's findings and suggests that difficulties with learning lead to higher levels of anxiety.

However, the results should be viewed with some caution as they are not reflective of different socio-economic (SES) backgrounds with one study including participants from low SES where 93.2% receiving free or reduced lunch (Harari et al., 2013) and one representing higher SES (Jarrett et al., 2015a).

2.6.2 Association between working memory (WM) and anxiety

Studies have indicated that maths anxiety has an effect on maths performance by impeding working memory resources (Ashcraft & Kirk, 2001; Mattarella-Micke et al., 2011). A study by Passolunghi et al. (2016) explored the effect of low or high maths anxiety on WM levels, predicting that those with higher levels of anxiety would be

more impaired in WM and inhibitory control. 34 low maths anxiety (LMA) participants and 32 high maths anxiety (HMA), aged 11-13 years from Northern Italy, were assessed on two different occasions one of which assessed their word reading and writing abilities and WM. In addition to completing the Abbreviated Math Anxiety Scale (AMAS), The Revised Children's Manifest Anxiety Scale: Second Edition (RCMAS-2) and Verbal Meaning, Primary Mental Abilities (PMA), pupils engaged in a verbal short term memory (STM) task and listening span task (LST). The results indicated that pupils with HMA recalled significantly fewer words than LMA in the STM and LST, suggesting an impairment of their WM.

However, whilst the study offered an insight into the impact of anxiety on WM, the study has limitations. Firstly, only the verbal component of WM was explored, and therefore the results do not consider any other form of STM. Secondly, the sample size of the study was small, and participants were from one school in Northern Italy. Therefore, the results are ungeneralisable. Finally, it is not clear if there is a correlation between WM and anxiety and if one directly causes a change in the other.

An earlier study by Morsanyi et al. (2014) contradicted these findings. To explore the link between anxiety and WM, 89 university students from the UK completed the AMAS and Cognitive Reflection Task (CRT). The CRT was a short test measuring an individual's tendency seek further reflection to answer questions rather than using their intuition. Participants, who either had high or low maths anxiety, were assigned to the control group, low load or higher load group. Tasks included grids with more dots in the high load group and fewer in the low load group, which participants were asked to recall patterns from memory. The findings showed no difference in recall

between low and high anxious participants suggesting that there was no relationship between anxiety and WM.

The study however was conducted with university students and therefore results may not be representative of school aged pupils. The experiment also lacked external validity in that the questions were not explicitly presented as maths questions and the test was conducted anonymously. This, therefore, reduced pressure on the participant to perform and was not reflective of a real testing situation.

Educational professionals, including EPs must ensure that implications of learning are considered when supporting CYP with anxiety. Without the early identification of anxiety and appropriate level of support, it is likely that a CYP's attitude towards learning will diminish and result in them leaving school earlier than their peers.

2.7 School-based interventions for CYP with anxiety

Children with anxiety are often overlooked when recognising those in need of interventions, which can have long-term effects on social and emotional development if left untreated (Mennuti et al., 2012). A school-based study involving 12 African American adolescents aged 14-17 years, focused on the use of a manual based Cognitive Behavioural Therapy (CBT) intervention (Ginsburg & Drake, 2002). CBT is usually a short-term intervention that has different aspects, incorporating a range of cognitive and behavioural techniques (Mennuti et al., 2012). Participants were randomly assigned to one of two groups, with no more than 6 per group; CBT group and the Attention-Support Control (ASC) group. The latter group offered the participants attention and support in the form of group discussions and peer support regarding their fears and anxiety, however, did not offer any CBT strategies.

The results of the interventions indicated that 75% of participants receiving CBT intervention and 20% receiving ASC support, no longer met primary criteria for a primary anxiety disorder. Whilst both groups showed an improvement, the post-treatment scores indicated a greater improvement in those receiving CBT treatment indicating that CBT treatment offered a more successful form of treating and managing anxiety in adolescents.

Although the study offered data into the effectiveness of CBT interventions, it was only reflective of a very small group of African American adolescents in one school in America, thus requiring replication to provide reliable data. The participants in the study also belonged to a low-income group and therefore, data does not show the effectiveness of CBT across different SES children or adolescents.

When exploring alternative interventions to CBT, a study piloting an intervention for adolescents with social anxiety, indicated similar results to Ginsburg and Drake (2002), and highlighted the benefits of school-based interventions. Skills for Academic and Social Success (SASS) was a clinic-based intervention that was adapted for delivery in schools (Masia et al., 2001). The intervention consisted of 14 sessions including psychoeducation, realistic thinking sessions and social skills training. The intervention also differed from that conducted by Ginsburg and Drake (2002) and Miller et al. (2010), in that it included compulsory group meetings for parents and teachers to develop their awareness of psychoeducation and understanding of social anxiety and how to support this in young people.

The intervention, which lasted for 40 minutes and took place once per week, was delivered to 6 students in a high school. The results collected from an independent assessment and self-report, indicated that 3 students markedly improved and 3

students moderately improved, with 50% of students no longer meeting the criteria for a social phobia. The self-report measures also indicated that there was a significant decrease in anxiety scores as a result of the interventions proving that an ongoing intervention is successful in reducing symptoms of social anxiety.

However, as the group numbers were small and results could not be compared to a control group to truly evaluate the effectiveness, the study required replication. In a study in 2005, the intervention was conducted with a larger group of 42 adolescents, with 21 randomly assigned to the SASS group and 21 randomly assigned to a wait list control group (Masia-Warner et al., 2005). A 9 month follow up assessment was conducted for those in the SASS group to evaluate the ongoing impact of the intervention.

The results indicated that there was a significant reduction of social anxiety in the SASS group when compared with the control group, with 67% of participants in the SASS group no longer meeting the diagnostic criteria of social phobia, compared to 6% in the control group. The 9 months follow up also indicated that the group maintained the clinical gains of the intervention with one participant no longer having social anxiety.

These results show that interventions are successful in supporting adolescents with social anxiety, with ongoing success after the intervention with support and of parents and teachers. Although the study focuses specifically on social anxiety, when compared with the results of the study by Ginsburg and Drake (2002), it supports the results that interventions are effective, particularly when involving elements of psychoeducation.

It should be noted however, that the SASS study was created by the lead researcher and thus there is a possibility of bias to report positive outcomes for the intervention. The study also focuses on adolescents and does not explore the impact of interventions on younger children in earlier education.

Results from Ginsburg and Drake and Masia et al. are further supported by the use of a FRIENDS programme in Norway, with 82 children aged 8-16 years (Fjermestad et al., 2020), with anxiety, depression and conduct needs. The FRIENDS programme, which is a 10 session CBT intervention, aimed to help challenge cognitive processes that are not helpful. The results indicated that anxiety and depressive symptoms were significantly reduced from pre to post treatment.

Although the study was conducted in Norway which is not reflective of a British sample, the results supported additional findings that group interventions incorporating a CBT approach, are useful to support and help reduce symptoms of anxiety. Additional research however is required to explore any gender differences in response to school-based interventions.

Further supporting these results, an additional study investigating the effects of active recreational maths games (ARMG) on maths anxiety in year 1 males, was conducted with 28 participants and compared to a control group of 30 participants (Alanazi, 2020).

The ARMG consisted of 24 sessions which took place over two months with students receiving three sessions per week for 45 minutes each. The intervention focused on the objectives of the Saudi Arabian curriculum to include factors such as counting, subtraction, addition, shapes and number order. A significant difference was found in levels of math anxiety pre and post intervention compared to participants in the

control group (p=0.043), indicating that the intervention was successful in reducing levels of maths anxiety. These results support findings that interventions have a significant impact on reducing levels of anxiety.

However, as with the previous studies, the sample size was considered to be small and reflective of one small geographical location, thus reducing the findings to the participants in the study. Furthermore, the study did not provide any information about participants awareness of their assignment to the intervention group and therefore, it cannot be determined if there was a level of allocation bias.

In contrast to these findings, Miller et al (2010) investigated the impact of CBT on anxiety reported no significant impact of the intervention. 116 participants were randomised across three elementary schools into a CBT intervention group (n=73) or control group (n=43). The CBT intervention, which specifically explored the programme 'Taming Worried Dragons' (TWD), was conducted over 8 weeks and provided participants with tools to cope with anxiety (e.g., thought-stopping, distraction, physical exercise, changing self-talk and exposure). Whilst there was a main effect of time on the reduction of anxiety scores in participants exposed to TWD (MASC: $\eta 2 = .07$; BASC-PRS: $\eta 2 = .10$), there was no significant effect of the intervention of anxiety scores.

These results, however, are reflective of a small sample of pupils in Canada within a small region, and therefore the effects of the intervention cannot be generalised to all pupils with anxiety. As with the study by Ginsburg and Drake (2002), the study was not reflective of pupils from varying cultural or SES backgrounds, therefore making the results specific to only the participants within the study.

Whilst the results generally indicate that interventions are successful in reducing anxiety in CYP, they highlight the need for research to be conducted on a larger scale in the UK to understand the impact of both CBT and non-CBT interventions in a school setting. This is essential to ensure that recommendations and implementation of school-based interventions are evidence based.

2.8 Clinic-based CBT interventions for CYP with anxiety

Clinic-based CBT interventions have been evaluated for both their efficacy and effectiveness. To evaluate the efficacy of an intervention or clinical trial, is to establish whether the expected outcome is produced under ideal circumstances and often includes short-term measurements. Contrastingly, effectiveness trials aim to evaluate the impact of interventions among more typical patients under real-world conditions, and usually includes a longer follow-up period. (Gartlehner et al., 2006; Selker et al., 2019). It is the effectiveness which is often regarded as being reflected in an RCT, however due to the often longer term intervention and failure for participants to fully adhere or remain in the study, it is not always possible to truly ascertain this (Wald, 2021).

To explore the efficacy of clinical CBT trials on childhood and adolescent anxiety, a systematic review was conducted by Cartwright-Hatton et al, (2004). In the systematic review, studies which were RCT in design and included participants aged 18 years or younger and who had a diagnosis of anxiety. were included. Less typical disorders, such as OCD, post-traumatic stress disorder (PTSD) or simple phobia were excluded from the studies, as it was felt that the outcomes for these may differ significantly from those more typical. Due to the varied range of self-assessment tools available and the difficulty in comparing them, trials which required self-

assessment, were also excluded. Trials were required to assign participants to an intervention group or an inactive control group, whereby no intervention was received, and the outcome measure used to determine the efficacy, was a diagnosis of anxiety upon completion.

Of the 10 eligible studies included in the review, all but one reported no anxiety diagnosis at the end of the intervention, with odds ratios greater than one. An odds ratio is a statistic that measures the association between the outcome measured and the exposure to the intervention. An odds ratio which is greater than one suggests that exposure to the intervention leads to higher odds of no diagnosis of anxiety. Therefore, the systematic review results exposed that CBT interventions applied in a clinical setting, are successful in reducing anxiety in CYP.

Whilst these results support that CBT can reduce anxiety in CYP under 18 years old, it should be noted that participants in the studies were not younger than 6, and therefore findings cannot be generalised to all ages. Additionally, the systematic review did not provide information regarding who delivered the interventions in the studies, nor their qualifications or training. Therefore, it cannot be ascertained as to whether CBT is generally successful, or success requires delivery from a qualified professional. Furthermore, it should be borne in mind that the data analysed was for the end of the CBT intervention and did not go on to explore the possible long-term effects on anxiety.

These results are supported by a review of existing meta-analyses which explored the impact of CBT clinical trials on various forms of anxiety (Butler et al, 2006). The review reported on the magnitude of the effect of the intervention in comparison to control groups or alternative forms of the intervention. This is known as the effect

size (ES): the greater the effect size, the greater the impact of the intervention on the reduction of anxiety. Existing meta-analyses were selected based on the rigour of their execution, which included the use of RCTs, sample-size weighting of the effect size, the inclusion of an analysis of the heterogeneity of the effect size and outliers and the inclusion of moderator variables in the results. The results from 16 meta-analyses, comprising of 332 studies in total, indicated that CBT was effective in reducing generalised anxiety disorder, panic disorder and social phobia. With generalised anxiety in particular, CBT was found to be more effective than alternate forms of anxiety interventions. Furthermore, when exploring the effects of the components of CBT on panic disorder, interventions that combined cognitive restructuring with exposure, showed the strongest effect (ES=0.68).

However, as with the results from Cartwright-Hatton et al, (2004), these results should be viewed with caution. Firstly, the meta-analysis did not identify who had delivered the clinical trials and whether a possible lack of training could have impacted the results. Furthermore, the inclusion criteria did not specify the need for a control group which did not receive the intervention. Therefore, within the meta-analyses being reviewed, the majority indicate that those in the comparison groups received the intervention, such as stress management therapy, behaviour therapy, supportive therapy or relaxation therapy. The inclusion of such studies does not allow for a true reflection of how effective the CBT trials were in reducing the anxiety levels of the participants.

To further investigate what components of clinic-based CBT interventions were considered to be most effective in reducing anxiety amongst pupils aged 3-18, Whiteside et al, (2020) conducted a meta-analysis. Studies were deemed eligible for inclusion if participants had an identified anxiety disorder. This included panic

disorder, social anxiety disorder, generalised anxiety disorder or separation anxiety. The CBT intervention was required to be delivered face-to-face and as part of a RCT. Furthermore, the studies regarded as suitable for the review were required to have a measure of anxiety and sufficient data that would allow for a calculation of the effect size. The systematic search resulted in 75 RCT studies, which were published between 1994 and 2016, being reviewed, with female and male participants being evenly represented (51.16% females). Of the 111 participants within the studies, 54.05% of the interventions were delivered at a group level, 39.64% delivered at an individual level and 6.31% delivered in a group and individual combined level. Interventions were delivered to participants by a therapist, however details of their qualifications or level of training were not provided. Participants who did not take part in the clinic-based CBT interventions were assigned to the no-treatment control group.

All but two studies, in the meta-analysis, used exposure to a feared stimulus, with most using stand-alone cognitive strategies and more than half adopting relaxation strategies. 6% of the studies did not include any anxiety management strategies (AMS) such as cognitive or relaxation strategies.

When analysing the pre- and post-intervention effect of the CBT and control group, child self-report suggested that the intervention which included in-session exposure to a feared stimulus, resulted in larger between-group effect sizes, when compared to no in-group exposure ($p=<.0.01$). Furthermore, interventions which included the use of either cognitive or relaxation strategies were not significantly related to pre- and post-treatment effect sizes ($p=0.84$ and $p=0.07$, respectively). Therefore, these results show that for a CBT intervention to be effective, gradual exposure to a feared stimulus, which is supported by a trained individual is required, in addition to

cognitive strategies which are taught within the delivered intervention. Contrastingly however, the findings clearly highlight that relaxation strategies were not assessed as being effective, rather they had detrimental effects, increasing the level of anxiety, and therefore should not be part of CBT delivery.

Whilst the results from the meta-analysis highlight the importance of considering key components of a CBT intervention to ensure effectiveness in reducing anxiety, the study is limited in that, as identified by Whiteside et al, (2020), the studies included in the review sought to explore the most common intervention components and did not explore those such as behaviour management. This does not allow a true reflection of additional components that may be considered effective in reducing anxiety in school-aged pupils and therefore further research is required to explore what additional elements of CBT may be effective is supporting CYP with anxiety.

2.9 Re-statement of the current aims

A number of theories and models, such as cognitive and conditioning models, propose differing accounts of the interplay between variables contributing toward the development of anxiety. It is, therefore, important to establish whether there is a more dominant theory that is relevant to the onset of anxiety in secondary-aged pupils. For teachers working within the classroom to support CYP and those undertaking the role of a Mental Health Support lead, who are required to identify anxiety in pupils and know how to support them, the need for this to be established is increasingly important so that pro-active measures can be taken.

Through the review of existing literature, it has yet to be understood whether the onset of anxiety symptoms is caused by varying mechanisms of these models. Within the cognitive model, further exploration is required to ascertain whether

anxiety is experienced due to involuntary thoughts such as NATs, or due to the level of control an individual feels they have over the outcome of an action. Furthermore, when exploring the conditioning model, it is yet to be established whether operant conditioning, whereby a voluntary response to a stimulus is experienced, or classical conditioning, where the response is involuntary, are more likely to exacerbate feelings of anxiety. It is important that causation of the onset of anxiety is established, to enable educational staff supporting CYP to make reasonable adjustments to the environment or to be aware of stimuli that may trigger a response in them, thus helping to alleviate levels of anxiety. Additionally, when considering the effectiveness of interventions in supporting CYP, evidence is required which identifies not only their efficacy; but also, whether, in real-world settings such as schools, these interventions are effective in supporting secondary-aged pupils.

Furthermore, as emphasised within Bronfenbrenner's Bio-ecological theory of human development (2005) (Chapter 1), the model highlights the importance of identifying salient environmental influences on student anxiety to enable those working with CYP, to adopt practice that is holistic and consider how systems surrounding a pupil may attenuate their experience of anxiety, and how these environmental influences can be harnessed to support anxiety reduction. However, it is yet to be ascertained whether the bio-ecological theory of human development is the most effective for teachers and educational staff to consider when supporting secondary-aged pupils with anxiety, or whether alternative theories and models should be considered, such as Erikson's Psychosocial Development Theory (Erikson, 1962), that better allow teaching staff to understand what systems around a pupil may cause anxiety to develop. For example, although offering a holistic understanding and approach to child development with an inclusive view of how a child does not develop in isolation,

but in relation to the systems around them, the model assumes that anyone who experiences a negative event in any of these systems, will not develop positively, thus implying that it is mostly environmental factors that play a significant part in a CYP's development. However, for teachers working with CYP, it is important to understand if additional models could be considered to explain the onset of anxiety, such as the combination of the gene-environment interaction (Falconer, 1960), which unlike Bronfenbrenner, proposes that different genotypes respond to different environments and therefore it is both factors that influence the development of a trait.

By ascertaining, what factors surrounding a secondary-aged pupil contribute to the onset of anxiety, this will allow educational staff to implement measures to support CYP, through their understanding of what factors may increase their experience of anxiety beyond the realms of the classroom environment.

Therefore, with an understanding of how anxiety may present differently in CYP and interventions that can be used to support them, a systematic review was conducted, to provide clear evidence-based responses as to how these are experienced in secondary-aged participants. A systematic review is a method of answering questions and making sense of research that has been conducted in a particular area. It is a method that uncovers any uncertainty in an area of research and identifies what still needs to be researched (Petticrew & Roberts, 2006).

2.10 Research questions

Following identification, review and analysis of existing literature, which met the pre-defined eligibility criteria, this review seeks to answer the following research questions:

- **Research question 1:** What factors contribute to a secondary-aged pupils' experience of significantly elevated anxiety?
    - Sub-question 1: How are significantly elevated levels of anxiety experienced between genders and what factors contribute to this?
    - Sub-question 2: What impact do significantly elevated levels of anxiety have on learning?
- **Research question 2:** How are school-based interventions effective in enabling secondary-aged pupils to manage significantly elevated levels of anxiety?

Chapter 3: Methodology

3.0 Chapter overview

This chapter presents the research methodology, before providing the purpose of a systematic review. A re-statement of the research questions is provided for the reader's reference, followed by justification of the methods used in this systematic review.

3.1 Purpose of the systematic review

The decision to undertake a systematic review was made following the outbreak of the global pandemic, COVID-19, which resulted in school closures and strict guidance to work from home. The researcher had initially aimed to seek the views of CYP regarding their experience of anxiety and how they felt they were supported within school. In addition, this would be triangulated with data collected from teaching staff to explore how they felt in supporting anxiety in pupils. However, as the discussion of one's experience of anxiety can be sensitive, it was judged that gathering views via new online video conferencing platforms would present ethical challenges, particularly as the researcher would be unable to debrief the participants appropriately or ensure that sensitive video platforms were safe and secure.

Therefore, with the wealth of literature and theories pertaining to anxiety, a need was identified for a systematic review. A systematic review aims to establish, evaluate and synthesise the best available research to answer pre-determined research questions, to provide informed and evidence based answers which, in turn, informs future practice and research (Boland et al., 2017).

In order to explore how anxiety was experienced and to evaluate the impact of school-based interventions in secondary-aged students, a systematic literature

review was undertaken, beginning with a systematic literature search. The literature search consisted of several steps, including the development of eligibility criteria and critiquing tools, which are all outlined in this chapter.

The review was conducted in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Guidelines (Moher et al., 2009), of which the checklist was followed to ensure relevant information was reported (Appendix I) . The review protocol was developed and registered with International Prospective Register of Systematic Reviews (PROSPERO) in December 2020 (CRD42020203941) (Appendix II).

The following research questions sought to be answered:

- **Research question 1:** What factors contribute to a secondary-aged pupils' experience of significantly elevated anxiety?
    - Sub-question 1: How are significantly elevated levels of anxiety experienced between genders and what factors contribute to this?
    - Sub-question 2: What impact do significantly elevated levels of anxiety have on learning?
- **Research question 2: How a**re school-based interventions effective in enabling secondary-aged pupils to manage significantly elevated levels of anxiety?

3.2 Eligibility Criteria

Following the finalisation of research questions, the eligibility criteria were developed in the form of inclusion and exclusion criteria. The inclusion and exclusion criteria defined the specific information that a study needed to contain to be included in the review. The inclusion criteria used for this review are described in Table 3.

Table 3.

Summary of inclusion criteria.

Criterion	Description
Participants	Participants were secondary-aged pupils, ranging from 11-16 years of age.
Diagnosis of anxiety	Participants in the study either had a medical diagnosis of anxiety or were believed to have anxiety by teachers or parent/caregivers, which was assessed using self-report or parent/caregiver report.
Definition of anxiety	A clear definition of anxiety was included. This definition did not need to be one identified in the DSM-5.
Assessment tool	The study identified a clear tool that had been used to measure or assess anxiety in participants. The outcome measures expected were standardised self-, parent- or teacher-report.
Description of methodology	A description of the method was included to allow interpretation of the study findings.
Publication date	Studies were published between 2010-2021, in peer-reviewed journals or doctoral theses. The decision for papers to be published between 2010-2021 was made as this was judged a broad time frame that would allow for the results to be sufficiently recent to ensure their relevance and applicability to secondar-aged pupils at the time the systematic review was completed.

English language	Papers were written in English.
Intervention	Interventions were school-based and delivered by the educational institution or in cooperation with the educational institution. This included those delivered offsite but in collaboration with the educational institution, such as school clubs. This ensured validity as the current systematic review is aimed to inform EP practice within education.
Study design	For intervention research, participants were randomly assigned to groups to remove bias or were experimental in design. Studies also included control groups so treatment effects could be measured against participants who did not receive an intervention. Studies also included the use of pre and post measures to assess the outcome of anxiety before and after the intervention. It was essential that studies exploring the impact of interventions, were experimental in nature, such as randomised controlled trial (RCT) or experimental, as these would provide methodology which was of sufficient quality and reduce the risk of bias (Hillman et al., 2020). Inclusion of an RCT, whereby the process is random, allowed one to draw a conclusion based on causality and ensures that factors that could influence participant's progression, are spread across groups (Connolly et al., 2018; Higgins & O'Sullivan, 2015).

Studies that did not meet one or more of the criteria were excluded. Table 4 illustrates the further exclusion criteria used.

Table 4.

Summary of exclusion criteria.

Criterion	**Description**
Primary age	Participants who were below 11 years old and above 16 years.
Secondary need	CYP who had anxiety as a secondary need.
No assessment	Studies that did not show how participants had been assessed to have anxiety.
Co-morbid diagnosis	Anxiety that was associated with additional diagnoses, such as Autism Spectrum Disorder (ASD).
Previous interventions	Participants who had been clearly identified as participating in additional interventions other than that being conducted in the research.
Not school-based	Interventions that were organised by external companies or individuals, such as Saturday school or took place in a clinical setting.

3.3 Development of Search Terms and Databases Used

An exploration of existing systematic reviews was conducted to better understand the use of search terms. Prior to exploring databases for literature, search terms were developed and refined to ensure results were relevant to the research questions and would produce relevant results.

An initial development of terms was suggested and discussed with the research team, although they were felt to be too broad. These were:

‘Anxiety’ AND [‘Children’ OR ‘pupils’ OR ‘students’ OR ‘young people’], Anxiety AND Intervention AND school and in the main body: Education.

Theses search terms were refined and identified by relating them to the eligibility criteria, which can be seen in Table 5**.**

Table 5.

Search terms identified in relation to eligibility criteria.

Eligibility criteria	**Search term(s)**
Diagnosis	Anxiety
Gender	boy* OR girl*
Age	‘Child* OR youth* OR pupil* OR ‘young people’ OR ‘young AND people’ OR ‘young AND persons’ OR student* OR adolescen* OR teen*
Setting	school OR after-school’ OR ‘after AND school'
Stage of education	'early AND childhood AND education*’ OR ‘secondary AND education’ OR ‘secondary AND school'
Intervention	‘intervention*

These search terms were used to explore five databases: Scopus, British Education Index (BEI), Education Resource Information Centre (ERIC), Web of Science and

PsychINFO. The use of these databases was directed by University College London (UCL) Institute of Education (IoE). Searches were limited to include papers written in English and published between 2010-2021.

3.4 Development of a Critiquing Framework

Before carrying out the literature search, ways to review the selected papers were carefully considered and guided by existing critical frameworks to ensure that each study would be critiqued fully and in line with the research requirements. Various assessment tools exist in the literature. Therefore, the first step was to review existing frameworks to determine their suitability. These are critiqued in the following section. It is important that frameworks or checklists are used to ensure the research process and results are critically appraised and reported on consistently and with coherence (Buccheri & Sharifi, 2017)

3.5 Existing Critiquing Tools

A range of tools were assessed to determine their appropriateness for critiquing the studies selected for inclusion in this systematic review. Details of the strengths and weaknesses of these tools is provided below (Table 6).

Table 6.

Strengths and weaknesses of available critiquing tools to review studies.

Critiquing tool	Strengths	Weaknesses
Critical Appraisal Tools (Joanna Briggs Institute, 2017)	• 13 tools which offered a range of suitable checklists for RCTs or experimental studies. • The checklists provided explanations for each question to make it clear to the reviewer what was being assessed • At the end of the checklist, there was an overall decision as to whether the study will be included or not	• The tools were lacking detail and specific information. For example, the quasi-experimental checklist questions the inclusion of a comparison group, however this was not present in the RCT checklist which would also have been appropriate. • Not suitable with comparative studies that were looking at group comparisons between variables, rather than intervention focused.

	and the reviewer was required to offer a justification based on the list.	• Did not pick up on inclusion of research questions, nor the sample of participants and how they were recruited.
Critical Appraisal Skills Programme (CASP) checklists (Critical Appraisal Skills Programme, 2018)	• 8 checklists designed for use with systematic reviews and RCT studies • The checklists assessed the validity, methodology, reporting of results and the application of the results in practice and thus offered a clear and concise method of critiquing studies. • The use of prompts under each question, provided a clear understanding of what was being checked within the papers.	• Aimed at reviewing intervention studies only. • The checklist did not help to critique studies which were comparative in nature, which had been reviewed to answer the research question exploring the difference in prevalence of anxiety between genders. • The CASP checklists also failed to assess the sample of participants and how they were recruited. • They did not identify how the results were analysed, whether any statistical analysis carried out was appropriate to the study or that the data analysed was in response to the research questions identified in the study.

Specialist Unit for Review Evidence (SURE), (2018)	• The SURE checklist was designed to work with RCT and other experimental studies. • The framework offered clear questioning and prompting for the researcher to consider and was broken down into sections corresponding with studies (e.g., outcomes, methods and results). • The checklist also contained additional questions which were not included in those mentioned previously, such as checking that results were linked to the outcomes and that limitations had been recognised by the authors.	• The checklist would not be appropriate for use with comparative studies. • There are also limited questions which relate to the eligibility criteria.

Framework for critiquing quantitative studies (Coughlan et al., 2007)	• Provided a step-by-step framework for critiquing quantitative studies and was clearly sectioned, to provide prompts for critiquing each section within a study. For example, the research purpose, methodology, ethical consideration, results and analysis and discussion. • The framework provided a clear and structured method for critiquing all quantitative studies, with clear prompts for the researcher to consider.	• Some questions included would not be relevant and would need to be adapted to suit the review being undertaken. • The framework was not set out in a checklist format and therefore not easy to use.

Of the frameworks reviewed, Coughlan et al's was determined to be the most appropriate and was used as the basis for developing a critiquing tool that was suitable to this systematic review, due to its clear structure and detailed content.

Cochrane Risk of Bias Tool 2 (RoB 2) (Higgins, Savović, et al., 2019)

In addition to the use of frameworks to critique quantitative studies, the Cochrane RoB 2 was explored to assess possible areas of bias within individual studies, which is mandatory in a systematic review (PRISMA, 2009). It is important to assess the risk of bias within a study as it gives assurance of its credibility and trustworthiness of outcomes made (Waddington et al., 2017).

The RoB 2 sought to minimise the risk due to methodological flaw, where bias can lead to an over or under-estimation of the true effect of an intervention. As outlined in the Revised Cochrane RoB tool for randomized trials (Higgins, Savovic, et al., 2019), terms used in version 1 of the tool such as selection, attrition, performance and detection bias, had been avoided as they were not specific enough and were felt to cause confusion.

The revised tool contained five domains to assess bias:

1. Arising from the randomisation process.
2. Due to deviations from intended interventions.
3. Due to missing outcome data.
4. In measurement of the outcome.
5. In selection of the reported result.

Each domain contained signalling questions to elicit relevant information. At the end of each domain, an overall risk rating was computed based upon researcher analysis. Finally, an overall risk rating was determined based upon the five domains.

3.5.1 Devising a Conceptual Critiquing Framework

The checklists reviewed had been designed for the critique of specific study designs, such as RCT studies. In this systematic review a range of studies were analysed to assess the internal validity, (RCTs, experimental and comparative studies), and therefore it was determined that a new tool would be devised which could be used with all study types.

As a result, a conceptual framework was developed specifically for this review based on elements of the checklists in Table 6. Drafts and amendments of the intended framework were discussed with the supervisory team before being finalised (see Appendix III).

This followed the structure of a typical research paper with 4 sections:

1. Introduction: A review of the aims/research questions, hypothesis and definition of anxiety provided.
2. Methodology: A review of the sample included in the study, including the inclusion/exclusion criteria used, the setting, and determining the level of anxiety present in participants. For intervention studies, the assignment of participants to intervention and control groups, use of pre and post measures and tools used to measure anxiety were reviewed.
3. Results/data analysis: A review to determine if all participants were accounted for at analysis stage, if data analysed answered the research questions and the appropriateness of statistics reported.
4. Discussion: A review of the explanation of the significance of findings, strengths/limitations, and conclusion.

Questions were identified underneath each section to direct the researcher to what should be considered. The response format was Yes, No, or Not Applicable; and a notes column was included for further clarification. Additional questions were added to the checklist as these were specific to the inclusion and exclusion criteria within the review. For example, ‘is there a clear definition of anxiety?’

The framework was piloted using a study by Aydin (2019) which sought to explore gender differences in test-related anxiety. It was important to pilot the framework using a study using an exploratory study as the existing frameworks from which questions were taken, were predominantly designed to critique intervention studies and therefore the applicability could be tested for other research designs.

Following the pilot, further changes and additions were made. For example, initially the framework sought to explore if the purpose of the study had been clearly identified and if research questions had been identified. However, upon piloting the framework it was felt that both questions were checking for the same thing and therefore the former was removed. Questions were removed as it was discovered that duplicates had been asked in different sections. For example, ensuring that the intervention has been described appropriately, which appeared in both the sample and method section of the framework.

3.5.2 Final Critiquing Tools

The piloting process highlighted that the critiquing framework only assessed the validity of the studies and that there was a need to record the narrative of the studies so that information could be captured that answered the research questions. For example, although the framework explored if a research design had been clearly identified within the study, it was equally important to record what this research

design was. As a result, an additional record form was created to record key information such as the sample size, location, and findings of each study, which could then be used when presenting the results to answer each research question (Appendix IV).

Due to the diverse range of methods, comparison groups, length of interventions and data analysis, a meta-analysis was not possible, and a narrative synthesis was deemed the most appropriate way to present and interpret data for this systematic review.

In addition to the use of the conceptual framework, the RoB 2 was used to determine the risk of bias in the studies that were included, which would determine the preciseness of the results that were reported.

In summary, the systematic review utilised three recording tools: a critiquing framework, a narrative record of the findings, and the Cochrane Risk of Bias (Figure 3).

Figure 3.

Final critiquing tools.

3.6 Literature Search

3.6.1 Initial Search

An initial search using the finalised search terms, resulted in the identification of 1,307 papers detailed in Table 7. The cut-off date for the inclusion of new studies was 27th February 2021.

Table 7.

Breakdown of initial search results from the key databases.

Database	Search results
SCOPUS	173
BEI	316
ERIC	158
Web of Science	617
PsychINFO	43
Total	**1,307**

Paper number, search terms, title, authors, publisher, date of publication, database and extraction date were all recorded in an Excel Spreadsheet. Next, duplicate papers were identified by using a conditioning format to highlight cells which contained the same text. In total, 76 duplicates were identified and then removed, resulting in 1,231 papers to be analysed. The PRISMA flow chart in Figure 2 (chapter 4) provides the detail of the results and screening process.

3.6.2 Screening Process

The screening process consisted of three stages:

1. The first stage involved screening the titles and abstracts against the inclusion and exclusion criteria.
2. The second stage involved analysing all remaining papers by a full paper review using the critiquing framework. Both stages are explained in the next section.
3. The final stage involved reviewing the references of the selected papers to check for eligibility.

3.6.2.1 Stage 1: Title and Abstract Review

A checklist process was conducted to assess the eligibility of each paper against the inclusion criteria. Studies that met the inclusion criteria as well as those that were coded as uncertain, were submitted in the next screening stage. Of the 1,231 papers, 1,093 were deemed as ineligible and were not included in the next stage. The majority of these studies either did not contain participants who were believed to have anxiety or that were not of secondary age (See Figure 2).

3.6.2.2 Stage 2: Full Paper Review

The remaining 138 papers were analysed against the critiquing and narrative framework.

Each paper was analysed and recorded individually using the paper number, with scores and reasons being entered on the main spreadsheet for transparency. If a paper met the eligibility criteria, a ‘2’ was coded. If partial information was provided a ‘1’ was coded and if no information was given or it did not meet the specification, a ‘0’ was recorded. If studies met the inclusion criteria and answered the research questions, they were included.

Of the 138 papers, 7 were included. 54 were determined as uncertain as it was believed that participants had not been clearly identified as having anxiety. For example, studies did not detail if participants were excluded from the study if the anxiety tool identified them as not suffering from anxiety. These papers were shared with the supervisory team, who analysed and assessed 2 as being eligible for the systematic review, resulting in a total of 9 suitable papers.

3.6.2.3 Stage 3: Reference Search

The references of the 19 papers entered into the systematic review, were checked to assess eligibility. A further 14 papers were assessed and after reviewing the full text, 1 was included in the final systematic literature review. Thus, resulting in a total of 10 eligible papers to be included in the systematic review.

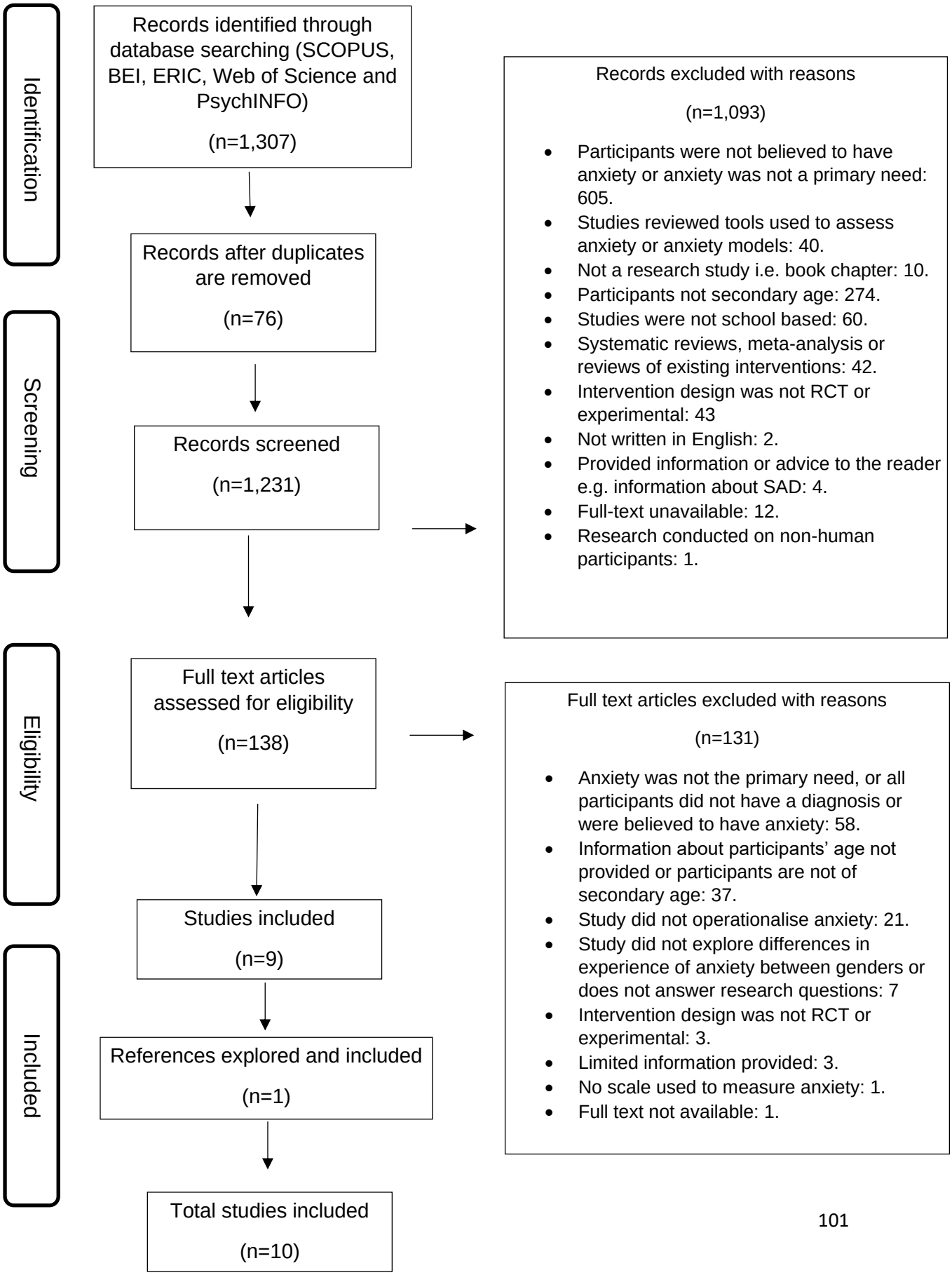
Chapter 4: Results

4.0 Chapter overview

This chapter presents the results of the systematic literature search and provides a summary of the characteristics of the studies deemed eligible for the review. In addition, results of the four intervention studies, which were assessed for the risk of bias, are presented before the studies are analysed and critiqued in line with the two research questions (see Chapter 3).

Figure 4.

PRISMA flowchart summarising findings of the search strategy.



4.1 Study characteristics

The following section provides an overview of the studies which are divided into two groups - exploratory and intervention.

Of the 10 studies which were published between 2010-2019, six explored the experience of anxiety amongst secondary-aged students, comparing male and female participants, as well as exploring contributing factors and the impact of anxiety. As can be seen from Table 8, which provides a summary of the exploratory studies by outlining the key characteristics, the studies were conducted in various countries including USA, Turkey, UK, New Zealand, Spain and India.

In line with the inclusion criteria (see Table 3), participants included in the studies ranged in age from 11-16 years. The studies focused on different forms of anxiety including mathematics anxiety, social anxiety, separation anxiety, test anxiety, science anxiety and GAD.

In addition to exploring the experience of anxiety in secondary-aged pupils, four studies reported results comparing differences between males and females, one on the impact of anxiety on learning and four reported on factors that contributed to anxiety levels, such as self-esteem and parenting styles.

Table 9 provides an overview of characteristics of the four intervention studies included in the systematic literature review, including the intervention and the length of time it was delivered. As can be seen, all four studies were Randomised Control Trials in design and explored the impact of CBT interventions on anxiety. The studies were published between 2017-2021 and were conducted in various countries including the Netherlands, UK and Pakistan. The age of participants across all

studies, ranged from 12 -16 years and included both male and female pupils. Studies focused on the impact of interventions on social anxiety and test anxiety.

Interventions were conducted over a six, to twelve week, period, with one study exploring the impact of an intervention after two years (de Hullu et al., 2017). Sample sizes varied across all studies and were generally small, ranging from 76 participants (Amin et al., 2020) to 240 (de Hullu et al., 2017).

In line with the inclusion criteria, all studies included the use of pre and post measures to determine the impact of interventions. These measures varied across the studies and were dependent on the type of anxiety being targeted.

The overall results indicated that one intervention led to a significant decrease in anxiety compared to control groups and whilst a decrease in anxiety was seen in participants in the remaining studies, there was no significant effect of the intervention.

Table 8

Characteristics of studies comparing anxiety differences between gender and age and an exploration of contributing factors.

Study (Author(s), Year, Country)	Study Design	Anxiety examined	Participants	Age/ year group (mean and/or range) and Sex	Outcome measured	Anxiety Measures
Bakhla et al. (2013), India	Cross-sectional	Separation anxiety, Social Phobia, Panic, Physical injury fear, GAD	146 participants	12 years/Class 8 (mean age 12.71 years) 55% male and 45% female.	Prevalence of anxiety in children and gender differences. Differences between parenting and anxiety.	SPENCE anxiety scale
Delgado et al (2018), Spain	Cross-sectional	Social anxiety	2,022 participants	12-16 years, 1053 male, 969 female	The difference in academic goals and learning strategies in students with and without anxiety. Prediction of high social anxiety on high academic learning goals.	Social Phobia and Anxiety Inventory (SPAI)
Grills-Taquechel et al (2010), USA	Cohort study	Social and Separation anxiety	77 participants	11-15 years (mean age T1= 11.69, T2=13.64) 40 female, 37 male	The roles of global self-worth, self-perceived social competence, and self-perceived	Multidimensional Anxiety Scale for Children (MASC)

					social support on changes in anxiety. Gender differences in anxiety.	Self-perception Profile for Children (SPPC) Social Support Scale for Children (SSSC)
Mann and Walshaw (2019), New Zealand	Cross-sectional	Maths Anxiety	Phase 1: 415 participants Phase 2: 16 participants	Phase 1: 12-13 years/Year 9, all female Phase 2: 12-13 years/Year 9, 11 female, 5 male	Maths anxiety and social structures that contribute to anxiety.	The Abbreviated Math Anxiety Scale (AMAS) Interviews with selected students
Putwain and Daly (2014), UK	Cross-sectional	Test anxiety	2435 participants	14-16 years (Yr 9 (n = 85) Yr 10 (n = 1218) Yr 11 (n = 1218)) 1215 male, 1220 female	Distribution of test anxiety amongst secondary pupils.	Revised Test Anxiety Questionnaire Friedben Test Anxiety Scale
Sagir (2012), Turkey	Cross-sectional	Science Anxiety	994 participants	12-15 years. 509 female, 485 male.	Relationship between anxiety levels and attitudes towards learning. Effect of gender, class and school-type on anxiety.	Science anxiety questionnaire (developed by researcher) Science attitude and perception questionnaire

Table 9

Characteristics of studies exploring the impact of interventions on anxiety.

Study (Author(s), Year, Country)	Study Design	Anxiety examined	Intervention (type and length)	Participants	Age (mean and/or range) and Sex	Outcome measured	Measures	Findings and Interpretations
Amin, Iqbal and Irfan (2020), Pakistan	RCT	Social Anxiety	CBT (culturally adapted cognitive behavioural therapy-based guided self-help (CACBT-GSH)) 8 weeks	76 participants. 38 allocated to intervention group; 38 allocated to control group. Randomisation occurred at participant level.	13-16 years (mean = 14.84) 45 male, 31 female.	The effect of intervention on social anxiety and self- esteem.	Adapted version of Liebowitz Social Anxiety Scale (LSAS-CA) Fear of Negative Evaluation Scale (FNES) Rosenberg Self-Esteem Scale (RSES)	The CBT intervention was found to be effective. A significant reduction in anxiety, fear of negative evaluation and improvement in self- esteem was found in the intervention group compared to the control group.
de Hullu et al (2017), Netherlands	RCT	Social Anxiety Disorder and Test Anxiety	CBT and CBM 10 weeks. 2 year follow up.	240 participants. 69 participants in the CBT group, 73	12-16 years (90% aged 13-14 years) 66 male, 174 female	Long term impact of CBT and CBM on social anxiety disorder, test anxiety, self-esteem, social skills, automatic	Social anxiety measure: Revised Child Anxiety and Depression Scale (RCAD)	After two years, a decrease in social anxiety and test anxiety was recorded; however, the interventions did

	participants in the CBM group and 58 participants in the control group, at the post-test stage. After 2 years, 46 participants were in the CBT group, 40 in the CBM group and 35 in the control group. Randomisation occurred at a school level.	threat associations, and fear of negative evaluation.	Test anxiety measure: Spielberger Test Anxiety Inventory Clinical interviews using the anxiety and mood sections of the ADIS-C	not have a direct significant impact on reducing these

Putwain and Pescod (2018), UK	RCT	Test Anxiety	CBT (The Strategies to Tackle Exam Pressure and Stress (STEPS)) 6 weeks.	56 participants initially randomised; 25 in the intervention group and 31 in the control group. Reduced to 46 participants at the end of the intervention: 20 in the intervention group and 26 in the control group.	Year 10 and 11(year 10= 30 pupils, Year 11= 26 pupils) 37 female, 19 male	Impact of intervention on test anxiety.	Revised Test Anxiety Scale Motivation and Engagement Scale.	No significant effect of the intervention was recorded on worry, tension or uncertain control. The intervention showed a decline in bodily symptoms and test-irrelevant thoughts.

Putwain and von der Embse (2021), UK	Test Anxiety	CBT (STEPS) 6 weeks.	146 participants. 80 allocated to intervention group; 81 allocated to control group 75 retained in the intervention group at analysis; 71 retained in the control group at analysis. Randomisation occurred at participant level.	14-16 years (mean age= 14.1) 101 female, 39 male, 6 not reported.	Evaluate impact of intervention on test anxiety.	Revised Test Anxiety Scale (RTA) School-Related Wellbeing scale (SWBS) Revised Children's Anxiety and Depression Scale (RCADS)	A significant decrease in test-irrelevant thoughts was found as a result of the intervention. However, there was no main effect of the intervention on worry, tension, bodily-symptoms or uncertain control

4.1.1 Risk of bias

Studies that were RCT in design were assessed individually using the Cochrane's RoB 2 (Sterne et al., 2019). A pre-existing spreadsheet, containing algorithms to compute results based on analysis, was used. Each study was assessed individually using the assignment to the intervention (the 'intention-to-treat' effect) and the effect of interest. In line with the Cochrane Guidelines (Higgins, Savovic, et al., 2019), this was deemed to be the most appropriate effect, as it helped to inform whether the intervention should be recommended. Table 10 provides a breakdown of the overall Cochrane Risk of Bias ratings, of which further detail is provided in the sections that follow.

4.1.1.1 Bias due to the randomisation process

In all studies, participants were randomly allocated to either the intervention or control group. The three studies evaluated as being low risk of randomisation bias included de Hullu et al. (2017), Putwain and Pescod (2018), and Putwain and von der Embse (2021), who concealed the randomisation process from participants and showed no issue with the randomisation process at baseline level.

The study by Amin et al. (2020) was evaluated as having some concern due to risk of randomisation. This level of risk was applied to this study as, although participants were randomly allocated to intervention groups, no information was provided regarding concealment of the process and/or about any issues that arose. Without this information, it could not be determined if the allocation process contributed to any potential bias.

4.1.1.2 Bias due to deviations from intended interventions

No studies were assessed as having problems that arose due to changes from the assigned intervention in relation to the trial protocol. All studies described the intervention and the purpose and followed this protocol throughout.

Additionally, all studies included an appropriate analysis of participants who were randomised, to estimate the effect of the assignment to the intervention. Participants in two of the studies were aware of their assignment to the intervention group, with researchers meeting with them beforehand.

De Hullu et al. (2017) revealed the assignment to either the intervention or control group following the pre-test, therefore reducing the risk of bias as participants were likely to answer questions truthfully, without pre-conceived expectations.

Although studies conducted by Putwain and Pescod (2018) and Putwain and von der Embse (2021) did not explicitly inform participants of their assignment to the intervention group, they were either allocated to the intervention group or wait-list control group, where no treatment was received. Therefore, participants would have been aware of their assignment.

Carers and individuals delivering the intervention were aware of the participants' assigned groups in all four studies and Amin et al. (2020) did not provided any information about participants awareness of their assignment to the intervention group. Therefore, it cannot be determined if there was a level of allocation bias.

Combining these assessments, three of the studies were deemed low risk of bias due to deviations from intended intervention and one as having some concern. The latter was due to no information being provided about deviations arising from the trial context.

4.1.1.3 Bias due to missing data outcomes

All four studies were assessed as being low risk, as studies either retained all participants at the end of the study or any number of participants with missing outcome data were considered small enough that it would have no impact on the estimated effect of intervention.

4.1.1.4 Bias in measuring the outcome

The method of measuring the outcome was determined to be appropriate, by assessing the validity of the measuring instrument, which did not differ between intervention and control groups in all studies. As can be seen from Table 10**,** one of the studies (de Hullu et al., 2017) was assessed as having high risk of bias as outcome assessors were aware of the intervention received by participants and therefore this could have influenced the results.

The remaining three studies specified that the assessors were blind to the intervention and therefore the outcome was less likely to have been influence by this knowledge, thus resulting in a low level of risk of bias.

4.1.1.5 Bias in selection of the reported result

In all studies, the data was analysed in accordance with a pre-specified analysis plan that was finalised before the unblinded outcome data was available.

Where outcomes were measured in multiple ways or at multiple time points, these were all analysed and reported, therefore indicating a low level of bias across all studies.

Table 10.

Summary of overall Cochrane Risk of Bias rating.

Author	**Date**	**Randomisation process**	**Deviations from the intended interventions**	**Missing outcome data**	**Measurement of the outcome**	**Selection of the reported results**	***Overall bias****
Amin, Iqbal and Irfan	2020	Some concerns	Low	Low	Low	Low	*Some concerns*
de Hullu et al	2017	Low	Some concerns	Low	High	Low	*High*
Putwain and Pescod	2018	Low	Low	Low	Low	Low	*Low*
Putwain and von der Embse	2021	Low	Low	Low	Low	Low	*Low*

**Italicised column indicates the overall rating of the papers.*

As can be seen from the Table 10, which provides a summary of the overall bias ratings, it suggests that one study had a high risk of bias, one with some concerns and the remaining two as having low levels of risk of bias. Overall high ratings were given to papers where participants or researchers delivering the intervention were aware of its nature, and therefore could possibly influence the outcome.

4.2 Narrative analysis of results

The following section will report a narrative analysis of results aligned with the two research questions, as identified in the methodology section.

4.2.1 ***Research question 1.*** *What factors contribute to a secondary-aged pupils' experience of significantly elevated anxiety?*

All of the studies included sought to investigate the prevalence of anxiety amongst secondary-aged pupils, apart from one (Delgado et al., 2018), who explored the impact of anxiety on learning. In addition, studies also reported on the contributing factors of anxiety (Bakhla et al., 2013; Grills-Taquechel et al., 2010; Mann & Walshaw, 2019; Sağır, 2012) and gender differences (Bakhla et al., 2013; Grills-Taquechel et al., 2010; Mann & Walshaw, 2019; Putwain and Daly, 2014).

As each study explored varying factors and their impact on the experience of anxiety in secondary-aged participants, the results will be reported using two subordinate research questions that have been identified by the researcher, before presenting the overall findings of the studies which answer research question 1. As identified in Chapter 1, anxiety is referred to as that which has been either clinically diagnosed or is experienced at so significant a level that it hinders an individual's ability to function on a daily basis

1) How are significantly elevated levels of anxiety experienced between genders and what factors contribute to this?
2) What impact do significantly elevated levels of anxiety have on learning?

4.2.1.1 How are significantly elevated levels of anxiety experienced between genders and what factors contribute to this?

The only English study in the review, sought to explore the prevalence of test anxiety in secondary pupils and to determine if gender differences existed (Putwain and Daly, 2014). Similar to one other study in the review (Delgado et al, 2018), Putwain and Daly recruited 2435 participants of which males and females were equally represented (1215 males and 1220 females). Participants were drawn from 11 comprehensive, coeducational secondary schools in Northwest England, who were already participating in a larger project related to test anxiety. Within the English school system, a comprehensive school is identified as a public school that does not select its intake of pupils based on their academic achievement or aptitude. These schools represented pupils from a broad socio-economic demographic, as indicated by the proportion of students eligible for free school meals (FMS) and not having English as a first language (EFL).

The results, following the completion of the Revised Test Anxiety Questionnaire, suggested that a statistically significant effect was found for gender ($F(3, 2431) = 95.07$, $p < .001$) thus also revealing that females experienced higher levels of anxiety compared to males. When exploring the levels of anxiety (low, moderate, or high), females were reported to be more likely to experience higher levels than moderate ($b = .62$, Wald $\chi2(1) = 25.59$, $p < .001$) or low anxiety ($b = 1.50$, Wald $\chi2(1) = 127.05$, $p < .001$) than a male peer.

Furthermore, females were reported to experience significantly higher levels of worry ($F(1, 2433) = 154.44$, $p < .001$, $d = .50$), tension, $F(1, 2433) = 277.98$, $p < .001$, $d = .68$); and social derogation, ($F(1, 2433) = 71.91$, $p < .001$, $d = .33$). Social derogation is defined as the fear of judgment from those within one's society, particularly in how they will be viewed. Gender differences of the effect sizes were moderate in worry and tension and small in social derogation, suggesting that females were more likely to experience anxiety in the first two forms.

Within these sub-categories, females were reported to be more likely to score higher in worry ($b = .62$, Wald $\chi2(1) = 34.35$, $p < .001$) (OR= 1.85 and OR= 3.92), tension ($b = .86$, Wald $\chi2(1) = 84.71$, $p < .001$) (OR= 2.35 and OR= 5.68) and social derogation ($\chi2(2)= 59.98$, $p < .001$, $R2 = .024$) (OR= 1.38 and OR= 2.28) than moderate or low, compared to male peers.

The overall findings of this study revealed that females experienced greater levels of anxiety compared to their male peers and this was specifically experienced in the form or worry or tension. However, as with the studies included in this review, the data was reliant on self-reporting and thus assumed participants awareness of their own needs.

The study does not provide detail as to how the data was collected from participants to ensure the elimination of researcher bias. In addition, although Putwain and Daly provide detail of the Free School Meals (FSM), EFL and GCSE characteristics of the schools in the study, this information was not provided at an individual level and therefore it was not clear whether the participants represented the socio-demography of the population of pupils in the country. Within England, FSM are

provided to families who receive other qualifying income-based benefit support from the government, due to low levels of income.

Only one study in the review conducted a longitudinal approach to explore the experience of social and separation anxiety (Grills-Taquechel et al., 2010). Specifically, the study sought to investigate how anxiety was experienced during a transitional stage between year 6 (T1) and two years later in year 8 (T2), when participants were 11-13 years old (T1) and 11-15 years (T2). In addition to exploring the impact of transitions on anxiety at two different stages, the study also investigated the experiential differences between males and females. Drawing on previously identified research, Grills-Taquechel et al. (2010) hypothesised that anxiety would be greater in T1 than T2 and that this would be greater for females at both times.

The study reported large effect sizes, which indicated that school transitions had a great impact in the development of social and separation anxiety (η^2=129)[1]. In addition, anxiety was reported to be significantly higher during T1 (η^2=.205) than T2 for all participants and that a main effect of gender was found (η^2=.163), particularly with separation anxiety (η^2=.151), suggesting that females were more likely to experience a specific anxiety type during a transitional stage in their education. Furthermore, unlike males, female participant's anxiety levels did not decrease between T1 and T2, particularly with social anxiety (female: η^2=.039; male: η^2=.217).

Specifically exploring the predictors of anxiety at T2, it was found that global self-worth, social acceptance and support scales (step 2) nor gender (step 3),

[1] η^2 - (Partial) Eta Squared should be interpreted as; 0.01 (small), 0.06 (medium) and 0.14 (large).

significantly improved the prediction of the symptoms of anxiety (Step 2: p=.07; Step 3: p=.98) or separation anxiety (Step 2: p=.55; Step 3: p=.97). On the other hand, variables at step 2 did improve the prediction of social anxiety (p<.01) with significant impact from global self-worth (p=<.01) and social acceptance (p=.02), indicating that higher scores on these areas led to a decrease in anxiety between transition points. However, these results were not presented as effect sizes and therefore the strength of the relationship between the two variables could not be determined. Within this study, global self-worth is identified as the extent to which one identifies their own self-worth and how happy they are within themselves, whilst social acceptance is the view one holds about how they are perceived and accepted by those around them (Grills-Taquechel et al., 2010).

These results suggest that not only was anxiety experienced at a greater level during transitional years, but that females experienced higher levels of anxiety which, unlike male peers, did not decrease with age. Additionally, contributing factors such as global self-worth and social acceptance predicted the onset of separation anxiety later in participants. The researcher provided an explanation for this by explaining that the older a pupil becomes, the more autonomy they have away from their parents and therefore are less likely to fear being away from them. However, at a younger age where this is experienced less, it is more likely that a child experiences this type of anxiety.

These results should be viewed with caution however, as they were representative of one school within a small town in USA and overrepresented the Caucasian population (88%), thus results could not be generalised to a larger population. SES data was not collected from participants and thus it was unclear if the results were reflective of pupils from varying SES backgrounds. In addition, the results were

reliant on self-reported assessment and therefore dependent on the pupil being able to identify signs and symptoms of anxiety, in line with statements presented on the MASC. The completion of the MASC was conducted in small groups, and it is unknown how this was administered or if participants were grouped by gender or class, which may have caused pupils to answer based on how their peers would likely respond. The researcher did not disclose detail of how the school and participants were selected to take part in the study, thus raising possible concerns of researcher bias. It also could not be determined what the level of anxiety experienced were of participants at recruitment and if this impacted the results at the end of the study. Finally, although a larger sample of participants were recruited during T1 (280), only data for 77 could be included in the results at T2 due to poor attrition.

One study conducted in Turkey however, contradicted these findings when exploring the relationship between science anxiety and their attitudes towards learning (Sağır, 2012), amongst pupils in year 6, 7 and 8 (12-15 years old). Schools were selected based on school placement test (PT) results and placed into one of three groups: schools with the city average score, above average or below average. The school placement test was used to determine which secondary school pupils would continue their education in. Adopting a survey model, participants were sampled using a cluster method and equal numbers allocated to each group: 313 students (31.5%) from two schools above PT average, 343 of them (34.5%) from three schools with average PT and 338 of them (34%) from three above average PT. In addition, year groups and gender were equally represented by participants.

Data was gathered in three sections, including the completion of a science anxiety questionnaire developed by the researchers, which had been piloted with 250 pupils

from a different school. A Cronbach alpha coefficient was determined to be 0.94, indicating excellent internal consistency.

Unlike Grills-Taquechel et al. (2010), who reported greater levels of anxiety in earlier years, the results from Sağır (2012) identified that there was a significant difference between levels of science anxiety according to the participant's age ($p<0.01$) with pupils in year 6 experiencing lower levels but having higher anxiety in year 8. However, the effect size was small (0.025) indicating that just 25% of the variance in science anxiety was due to the participants' age. The researcher proposed that this may have been due to testing in year 8, which could have contributed to the development of anxiety.

It is useful to consider the study by Grills-Taquechel et al. (2010) when interpreting these results, who established that younger participants experienced higher levels of anxiety as this was a point of transition. Similarly, year 8 pupils (aged 12-15 years),in the study conducted by Sağır (2012) were identified as those who were in transitional stages between schools, and therefore this may have been a possible cause of higher levels of anxiety in older participants.

Furthermore, when exploring the impact of out of class support on science anxiety, Sağır reported a significant difference between those receiving support and those without ($t=2.48$, $p=.005$). Participants were reported to have lower levels of anxiety when receiving additional support compared to their peers, thus indicating that a lack of support during learning can contribute to pupils experiencing greater anxiety.

It was also reported that participants attending high PT schools, where pupils required higher scores in their primary tests to be admitted into a particular secondary school, had a higher level of anxiety than their peers in schools with lower

success. This can be interpreted as the expectation of achieving higher scores, led to greater levels of anxiety. When participants receiving support were analysed, a significant difference was also found amongst school type ($F=6.497$; $p<0.01$); specifically, those from schools of high and medium levels of success. However, the effect size is small (0.013) indicating that only 13% of the variance in science anxiety can be accounted for due to school type.

The main findings in the study appear to report that support for pupils within schools is likely to reduce the levels of anxiety amongst participants. However, although benefiting from a larger sample size in comparison to the study conducted by Grills-Taquechel et al. (2010), the results should be viewed with caution.

Although reporting significant differences in anxiety levels, the effect sizes appear to suggest that the variables analysed contribute to a small percentage and therefore additional factors may be in effect. In addition, the tool used to collect pupil views may have contributed to skewed results. To gather participant data regarding their science attitudes and perceptions, a questionnaire was administered. However, the Cronbach alpha determined the science attitude and perception questionnaire as 0.67 which implies questionable internal consistency and therefore questions may not have been similar enough to reflect the results reported.

Unlike Grills-Taquechel et al (2010), no transparency was provided regarding informed consent from parents or carers for their child to participate in the study, which raises the issue of possible ethical concerns.

The measure of anxiety relied on self-reporting from participants and therefore assumed that they were aware or able to identify feelings or signs of anxiety. The results were also representative of pupils in Turkey and therefore cultural

consideration should be given to results reported and further possible impacts on anxiety. Furthermore, no SES data was provided by the researcher to determine if the data was representative of all pupils in Turkey or a subset.

Finally, the study failed to identify limitations and thus eliminates the possibility of interpreting the validity of the work or offering a level of credibility to the conclusions made. This also does not allow researchers to identify future gaps to be explored within the field.

Mann and Walshaw (2019), the only study included in the review to adopt a mixed methods methodology, conducted a study involving 15-year-old females, from New Zealand, to explore the prevalence and contributing factors of mathematics anxiety. The study adopted two phases; phase 1 consisted of a survey to collect data, followed by phase 2 which consisted of focus group interviews. Male participants were used as a comparison group during phase 1, and only females scoring as highly anxious on the maths anxiety scale, participated in phase 2.

The results indicated that gender differences were statistically significant for Mathematics Test Anxiety (MTA), Maths Learning Anxiety (MLA) and Total Maths Anxiety (TMA) ($p<0.001$, $p=0.028$, $p<0.001$ respectively), thus identifying that females experienced higher levels compared to males. When analysing gender with school variables such as school decile and school gender type, females from higher decile schools were reported to have the highest mean levels of TMA ($M =20.56$, $SD =7.45$). Furthermore, a significant gender difference was reported for females in higher decile schools for MTA ($p=0.015$) and TMA ($p=0.017$).

School decile reflects the extent to which students are drawn from varying SES backgrounds; the lower a school's decile, the more government funding they receive

to support pupils. When assessing school decile, females from medium decile schools also had statistically significant higher means compared to males from medium decile schools for MTA, MLA and TMA ($p<0.001$, $p=0.009$, $p<0.001$ respectively), with no significant gender differences within lower decile schools. This indicates that pupils from an average SES community, experienced greater levels of anxiety compared to peers from low or high SES backgrounds.

When analysing anxiety by school type, a significantly higher mean was reported for females from single sex schools for MTA, MLA and TMA compared to male peers from a single sex school ($p=0.010$, $p=0.022$, respectively), and a statistical significance of gender for co-educational participants for MTA and TMA ($p=0.001$ and $p=0.007$ respectively). When comparing integrated and state schools, females reported higher levels of MTA, MLA and TMA from integrated ($p=0.001$; $p=0.050$; $p=0.002$ respectively), indicating that the level of anxiety not only varied between genders, but was determined by school type.

In addition, out of 434, 92.5% of participants reported negative feelings associated with maths. More specifically, this anxiety was related to tests, with a range score of $M=10.48$, $SD=4.19$. The vast majority of participants experienced no anxiety although, 39 participants (9.4%) scored 8 out of 20, the most common total, indicating a lower level of anxiety. Six participants (1.5%) reported the highest score indicating the highest level of anxiety. These overall results suggest that if maths anxiety is experienced in secondary-aged participants, it is more likely to be in the form of a low level related to maths testing.

Focus group interviews were conducted to gain further understanding into the views of participants. Focus group interviews are often held with between 6-12 participants

for 60 to 150 minutes and provide a rapid insight into how a subject or issue is perceived by the participants. The focus group is facilitated by a moderator who puts forward questions or scenarios for the participants to consider and provide responses to. Focus groups provide rich, qualitative data for the researcher to analyse, as responses can be explored in greater depth, rather than quantitative data which more often utilise questionnaires to explore participant views. (Robinson et al., 2020; Stewart & Shamdasani, 2015).

The focus groups provided qualitative data where participants compared experiencing maths anxiety to weather, such as feeling ‘cloudy’ or ‘stormy’. Descriptions were also provided highlighting that participants experienced anxiety as feeling panicked, having mind blanks and/or feeling overwhelmed in a test situation.

The study also explored maths anxiety in relation to learning and found participants self-reported scores ranged between 4 and 20 (M =6.89, SD=3.16); one hundred and thirty-eight (33.3%) scored 4, indicating no feelings of anxiety towards learning and two participants (0.5%) reported the highest score of 20.

Furthermore, Mann and Walshaw (2019) reported that whilst learning was able to contribute to anxiety (M=6.89, SD= 3.16), it was more commonly a result of testing (M=10.48, SD=4.19), with 85.3% of participants who identified with test anxiety-inducing statements, experiencing maths anxiety (M =2.87, SD=1.23). This was confirmed during focus group interviews where participants with high maths anxiety identified becoming highly anxious towards upcoming tests and whilst sitting them (92.5%). A participant reported that test anxiety emerged during secondary school as they had not been exposed to tests in primary school, indicating that this lack of early exposure and experience contributed to a high level of test anxiety. The results

showed that the participants were more likely to experience maths in the form of test anxiety rather than learning anxiety.

The results from this study suggested that females experienced higher levels of anxiety to males and that this was impacted by the school rating and school type, with higher decile and integrated school pupils experiencing more anxiety. Furthermore, anxiety was likely to be present due to testing rather than learning as pupils had not previously been exposed to this situation.

This study attempted to offer a richer set of data through the use of focus interviews, however concerns are raised by the quality of the study in comparison to others included in this review, and thus could be regarded as poor and likely to impact the validity and reliability of the results. This should be considered when interpreting the results from the study.

The results reported by Mann and Walshaw appeared to represent a small percentage of participants who experienced anxiety, with just 1.4% assessed as having higher levels. Statistical data was not provided regarding the number of participants who did not experience any anxiety; however, this can be clearly seen in a chart which is presented in the paper. Therefore, with most participants experiencing no anxiety symptoms, clarification was not provided as to whether data for these participants were used in the study to compare anxiety levels, when they did not experience any.

Although appearing to dispute that anxiety is due to learning, the study by Mann and Walshaw (2019) was not rich in quantitative data and therefore the significance of the results could not be identified. Only percentages were offered which did not allow

any interpretation to be made regarding the causation or effect of variables on maths anxiety.

Mann and Walshaw reported that the validity of the maths anxiety scale had previously been established, however did not offer statistics or details of this outcome. It is, therefore, unclear what level of reliability it held and thus the impact of the scale had on the results. The study did not identify under what conditions the MASC was completed by participants and therefore it could not be determined if there was any element of researcher bias or peer influence in responses that were given.

The study also briefly identified that schools were selected based on their eligibility; however, the Mann and Walshaw do not provide details about the criteria. In addition, no information was provided to determine how the schools were selected or asked to participate. Furthermore, whilst male participants were included in the sample to allow for comparisons with female students, no information was provided as to how they were recruited or what criteria was used. No data has been provided for ethnicity of any participants which does not allow for variables to be taken into consideration when interpreting the results.

It has clearly been identified by the researcher that the study was representative of New Zealand, with participants from one region within the country and being predominantly female. Therefore, these results could not be generalised to all participants who suffer from maths anxiety. As with the study conducted by Sağır (2012), no ethical consideration was given when recruiting participants and it is unclear as to whether consent was obtained prior to the data being gathered.

During focus interviews, participants were asked to provide metaphors related to the weather when describing anxiety. This method of data collection may not have provided a clear representation and true reflection of what participants had wanted to identify when discussing their experience of anxiety and is up to the reader to make their own interpretations. In addition, no script was provided to determine the types of questions that were asked by the researchers, thus being unable to identify if leading questions were used to elicit responses that benefited Mann and Walshaw. It should also be considered that no interview data was provided for male participants to offer a comparison, putting forward the question as to why male participants took part in the interviews at all.

Finally, Mann and Walshaw identified the use of themes from the focus group interview data, however it was not clear how these were determined. A clear methodology and rationale were not provided to allow for the study to be replicated.

In a cross-sectional observation study which supported prevalence findings of the studies in this review, Bakhla et al. (2013) explored the importance of gender and parenting in the development of anxiety, in India. The purpose of a cross-sectional design is to establish whether there is a relationship between two or more variables. A cross-sectional design is deemed to be a simpler correlational design as it requires all measurements to be taken at the same time and does not require any manipulation of subjects or environments (Spector, 2011) The most common approach used when adopting a cross-sectional design, is to take the views and opinions of a specific, pre-identified group and use this data to compare relevant variables (Edmonds & Kennedy, 2017).

One hundred and forty six pupils, within one school, completed the Spence anxiety scale and provided socio-demographic data. The results from the anxiety scale indicated that 11% (n=16) participants were classified as having high anxiety. However, when reporting these by gender, one was male and 14 were female. This clearly showed that one participant had not been accounted for, however the researcher did not provide an explanation for this omitted data entry. When analysing the gender differences in sub-types of anxiety, above cut off means were higher for females in separation anxiety, social phobia, panic, and GAD. Furthermore, a significant difference in sub-scale mean ranks between males and females was found in all sub-types.

Finally, when data was analysed to determine pupil's perception of parenting and the impact on anxiety levels, mean anxiety scores were higher for those who viewed it as authoritarian (34.76 ± 13.84) compared to democratic (21.21 ± 9.45) and permissive (20.82 ± 11.49). This suggested that parenting that was perceived as authoritarian in style, led to an increase in anxiety amongst adolescents, compared to a more relaxed style. An authoritarian style of parenting is characterised by a level of high demand and expectations for conformity and is often associated with the use of physical punishment (Valentino et al., 2012).

Overall, the results from Bakhla et al's study suggested that a small percentage of pupil's experienced a high level of anxiety and this was impacted by an authoritarian style approach to parenting. In addition, females experienced greater levels of anxiety compared to male peers in all sub-scales of anxiety.

The results, however, should be viewed with caution. Firstly, although it was reported that parenting style was a contributing factor to anxiety, a correlational analysis had

not been reported to establish if one variable directly impacts the other. This is a broad generalisation to make without the appropriate statistical analyses having been conducted and thus did not consider additional influences such as personality type or past experiences, which could also impact anxiety. The study also relied on self-reported measures of anxiety for which the results were dependent on participants ability to identify their own needs or experiences.

Furthermore, the study was representative of a narrow age group in one school in India, and therefore results cannot be generalised. It was also not made clear how the school was recruited and what sampling method was used, making it unclear if any bias was present at the recruitment stage. As identified by the researchers, the study was conducted in an affluent part of India and therefore the results could not be generalised to pupils from varying SES backgrounds.

The methodology was also limited in detailing how the data was collected from participants and under what conditions. Similarly, without this information it cannot be determined if researcher bias was present.

Finally, although females were reported to have greater levels of anxiety compared to their male peers, males in the study had been overrepresented and thus more data was available for them. Had females been equally represented in the study, this may have impacted the results.

4.2.1.2 What impact do significantly elevated levels of anxiety have on learning?

Unlike studies included in the review, Delgado et al. (2018) identified what impact anxiety had on learning for pupils in secondary school, by comparing pupils with and without anxiety. The study sought to analyse the relationship between social anxiety, academic goals and learning strategies, amongst 2,022 pupils aged 12-16, in Spain.

Identifying gaps in existing literature three objectives were formed, including the comparison of pupils with and without high levels of social anxiety, and relevant hypotheses formed.

Participants were sampled using a random sampling by clusters method, from schools in geographical zones of Alicante and Murcia. 20 schools were randomly selected from rural and urban areas to ensure equal representation resulting in 14 public schools and six which were private. After the selection of schools, four classrooms, in each, were randomly selected.

Following the completion of the Social Phobia and Anxiety Inventory (SPAI), a moderate effect size was found between pupils with no social anxiety and those with high levels (d=0.55)[2] with12.06% of 2,002 participants assessed as experiencing high social anxiety. Of these pupils a significant difference was found with time management (p=.03), concentration (p=.00), attitude towards learning (p=.00), being able to select main ideas (p=.00) or engage in evaluative strategies (p=.00). Thus, indicating that students with high social anxiety concentrated less, had a poorer attitude towards school and presented with a higher level of school anxiety to those without social anxiety. However, the reported effect size for this experience of social anxiety in relation to learning was small, ranging between 0.15 and 0.45, indicating that the relationship between variables was low.

In addition, pupils with high levels of social anxiety presented with higher levels of school anxiety than those with no social anxiety (d=0.55). A large effect size indicated that the presence of school anxiety was due to the presence of social anxiety.

[2] Cohens d effect size should be interpreted as; > 0.2 (small), > 0.5 (medium) and > 0.8 (large).

The prediction of learning strategies confirmed these results, which were reported as odds ratio (OR), indicating that those who experienced high levels of social anxiety had a lower probability of presenting with an adequate attitude towards school learning (OR=0.52)[3]; of being motivated to learn (OR=0.68); of presenting with time management skills (OR=0.67); of maintaining concentration (OR=0.39); of being able to select main ideas (OR=0.50) or engaging in evaluative strategies (OR=0.39). They also had a higher probability of having anxiety and school related worries (OR=0.29). Therefore, there was a larger effect of attitude, motivation and time management on social anxiety experienced by secondary-aged participants.

The overall results of the study suggested that pupils with social anxiety were more likely to have poorer academic goals and less likely to engage in learning techniques. Furthermore, pupils with social anxiety were more likely to experience school anxiety compared to their peers who experienced no anxiety.

Unlike Mann and Walshaw, the study conducted by Delgado et al (2018) had a large sample size, however it was more representative of males than females (52.1% male and 47.9% female). In addition, the first year was overrepresented with 576 pupils and fourth year underrepresented with only 439, and thus it cannot be determined if there was a difference in age and anxiety experienced.

Finally, given the nature of where the study was conducted, there was an over-representation of Spanish students (88.9%) compared to 6.34% Latin-American, 3.37% European, 0.75% Asian and 0.64% Arabian. The study did not provide detail

[3] Odds Ratio should be interpreted as; OR=1 (exposure does not affect odds of outcome), OR>1 (Exposure associated with higher odds of outcome, OR<1 (Exposure associated with lower odds of outcome).

of whether this represented the ethnic population within the area of Spain and if the results were generalisable.

4.2.1.3 Overall findings of the studies included in research question 1.

In sum, the studies indicate that there are significant differences in the experience of anxiety between genders, with 100% of studies identifying females as reporting higher levels compared to males. Furthermore, females are more likely to experience anxiety in the form of worry and tension. These results are consistent across varying age groups and include transitional stages such as year 6 and year 8 pupils (Grills-Taquechel et al., 2010) and year 10 and year 11 (Putwain and Daly, 2014).

Furthermore, the results suggest that various factors can impact anxiety, with some emerging themes identified. For example, school type and SES appear to impact anxiety levels such as single sex schools and high achieving schools (Delgado et al., 2018; Mann & Walshaw, 2019), as well as key testing periods for pupils (Mann & Walshaw, 2019), where greater expectations are placed on them. Therefore, higher levels of anxiety results in a lower attitude towards learning, motivation, concentration, selecting ideas or ability to engage in evaluative learning strategies, as well as global self-worth and social acceptance (Delgado et al., 2018; Grills-Taquechel et al., 2010).

Generally, however, the quality of the studies included in the review could be considered as poor, with flaws in methodologies and reporting of results. Overall, the studies did not represent a broad range of socio economic statuses (SES), with three not reporting the SES of participants (Mann & Walshaw, 2019; Putwain and Daly, 2014; Sağır, 2012) and two representing lower-middle and upper class participants

(Bakhla et al., 2013; Grills-Taquechel et al., 2010), which do not allow for SES to be taken into consideration when interpreting results.

Both Grills-Taquechel et al. (2010) and Mann and Walshaw (2019) provided minimal information regarding recruitment, which contributed to bias within their studies. Furthermore, ethical consideration is not provided in two studies (Mann & Walshaw, 2019; Sağır, 2012).

The results within studies are viewed with caution, particularly when quantitative data is not provided and results reflect a small percentage of participants with anxiety (Mann & Walshaw, 2019). Furthermore, missing data (Bakhla et al., 2013), poor attrition (Grills-Taquechel et al., 2010) and questionable validity of questionnaires used within studies (Sağır, 2012) all reduce the reliability of the reported results.

The only study included in this review with a higher reliability and quality was that conducted by Putwain and Daly (2014), who provided a clear methodology and reporting of results. The study provided clarity in regard to the methodology and appropriate statistics to allow the findings to be interpreted by the reader.

Finally, whilst the results are clear in identifying gender differences in the experience of anxiety, they conflict when determining whether anxiety is greater during earlier or later points of a young person's education, which remains unanswered (Grills-Taquechel et al., 2010; Sağır, 2012).

4.2.2 ***Research question 2.*** *How are school-based interventions effective in enabling secondary-aged pupils to manage significantly elevated levels of anxiety?*

Three studies explored the impact of CBT interventions on anxiety (Amin et al., 2020; Putwain and Pescod, 2018; Putwain and von der Embse, 2021), with one study comparing both CBT and CBM interventions (de Hullu et al., 2017).

Only one study found CBT to have a significant impact on the reduction of social anxiety in the intervention group, when comparing to the control group (Amin et al., 2020). The study consisted of a culturally adapted CBT-based self-help intervention with participants aged 13-16 years, over a period of eight weeks. 76 participants, who were reported to meet the inclusion criteria, were equally divided between the intervention or control group. The control group received treatment as usual (TAU), which was supported by the teacher, however details of this treatment was not provided by the researcher.

This programme encouraged participants to become their own therapists, with sessions providing information about social anxiety, its link to anxiety and techniques to control their symptoms. In addition, participants were provided with knowledge of how emotions, physical symptoms and behaviours were linked and understanding of cognitive errors and how to recognise these.

The reported results suggested that a significant reduction, in addition to large effect sizes, were found in anxiety ($p < .001$, $\eta^2=.477$), fear of negative evaluation ($p < .001$, $\eta^2=.605$) and improvement in self-esteem ($p < .001$, $\eta^2=.422$), when comparing baseline scores of the intervention group to that of the control group. Scores reported post-test showed that a higher percentage of participants in the intervention group achieved below the cut-off point (65.8%) compared to the control group (26.3%). This suggests that the intervention had a positive effect of reducing the level of anxiety in participants who received the treatment.

These results should be viewed with caution however, as the methodology provides several limitations which are likely to impact the findings. Although participants were randomly assigned to their groups and assessments were carried out by individuals

who were blind to the allocation, it is not known if the participants were informed of the allocation sequence before assignment or if they were aware of their group whilst they were treated. Therefore, this increases the possibility of bias within the study and could impact the results.

In addition, the control group were reported to receive their usual treatment, which suggests that they still received a level of intervention or support. As the researcher did not provide detail about the length or level of this support, it cannot be determined if the groups were treated equally and if the ongoing support had impacted the small reduction in anxiety which was found in the control group. Furthermore, the study did not account for any external variables that may have influenced the reduction of anxiety found in participants. If an intervention had been deemed to be effective, one would expect the reduction in anxiety in the control group to be smaller, thus suggesting an additional variable may have influenced this result.

As the intervention was culturally adapted to support the pupils in schools in Pakistan, this means that the intervention itself is likely to only be effective in supporting participants from the same cultural background and therefore cannot be applied globally. Additionally, the participants were selected from a small number of private schools, further reducing the ability to generalise the findings to pupils who attend school in the public sector. As found in the study by Mann and Walshaw (2019), the school type is likely to impact the level of anxiety experienced by a secondary-aged pupil and therefore these results do not determine if the intervention would be effective for pupils in single-sex, co-education or public schools. Furthermore, the small sample size should be borne in mind when reviewing the

results. With only 76 participants, it is not possible to generalise the effects of the intervention on a larger population.

Finally, whilst Amin et al identified criteria for which participants had been excluded from the study, elaboration was not provided as to the eligibility criteria and how participants were selected or why only private schools were chosen.

Three further studies however, found CBT interventions to have no main effect in the reduction of anxiety. The STEPS CBT intervention was evaluated to determine if mediation of the role of uncertain control reduced the level of test anxiety in secondary-aged participants (Putwain and Pescod, 2018) and to determine the impact on test anxiety, well-being and clinical anxiety (Putwain and von der Embse, 2021). The STEPS intervention was delivered once per week to a group of no more than 6 participants by computer and comprised of six sessions. Sessions included self-reflection and the practise of anxiety management strategies.

In the study conducted in 2018, two secondary schools were identified and 56 participants, in their final two years of compulsory study, participated. However, ten participants chose to withdraw from the study, resulting in data from 46 participants being analysed. Participants were randomly allocated to the intervention or the wait-list control group. The intervention group were identified as the early intervention group (T1). The wait-list control group also received the STEPS intervention after the early intervention group had completed the six-week programme (T2), for which data was collected.

A significant difference (p .004) and large effect size (η^2=.18) was reported of the intervention on test-irrelevant thoughts, with a decline from baseline for both T1 and T2. However, there was no main effect of the intervention on worry, tension, bodily-

symptoms or uncertain control. These results indicated that the STEPs intervention was significant in reducing the effects of worry however not for other areas of anxiety.

In addition, a mediation analysis determined a decline in worry and tension scores from baseline to T1, with a large effect size (R^2=.079/ R^2=.064 [4]respectively) and between T1 and T2 (R^2=.204/ R^2=.178 for worry and tension respectively), which were partly mediated by uncertain control. This indicated that worry and tension could have been impacted by uncertain control and that by reducing the latter, the former symptoms partly decreased.

Overall, the results suggested that whilst the intervention was successful in reducing a component of anxiety such as test-irrelevant thoughts, it was ineffective in reducing anxiety in general. Furthermore, the mediation of uncertain control was found to partially mediate a decline in worry and tension scores for all participants following the intervention.

However, consideration should be given to several factors when interpreting these results. The sample size within the study was small, with only 46 participants completing both pre and post-test measures. Furthermore, the participants were representative of only two schools in an urban area of the UK. Therefore, it is not possible for these results to be generalised.

The recruitment process suggests the possibility of researcher bias; the two schools were selected as they were known to the lead researcher, who was conducting an additional study with them. Therefore, being familiar with the needs of the pupils and school. In addition, all participants were told the nature of the experiment prior to

[4] Model R^2 - R Squared effect size is interpreted as > 0.02 (small), >0.13 (medium) or >0.26 (large).

engaging, which could lead to bias as they may have wanted to report the desired results as expected by the researcher.

Participants in the study were predominantly white (n=21) and only 12 participants were eligible for FSM, thus indicating that the results did not reflect pupils from varying SES or ethnic backgrounds.

Finally, it is not clear what the eligibility criteria was, and the level of anxiety experienced by the participants at baseline. This means it cannot be determined if the intervention was not successful in supporting all levels of anxiety or for those with higher or lower levels.

Extending the evaluation of the STEPS intervention to include school-related well-being and clinical anxiety, Putwain and von der Embse (2021) conducted their study with 146 participants, from eight schools, in their final two years of compulsory education. The methodology was similar to the earlier study conducted by Putwain and Pescod (2018) however, participants were only deemed eligible if they scored in the 66th percentile on the RTA which indicated a high level of test anxiety, or if a referral was made by the teacher. In addition, participants who were allocated to the wait-list control group, were offered to receive the STEPS programme after post-intervention data was collected, however unlike the earlier study, no data was taken from them.

The results reported a main effect of time (.30)[5] and intervention (.07), which were supported by a time x intervention interaction (.07). Furthermore, participants in the intervention group were reported to show a statistically significant decrease in test anxiety ($t(64) = 6.75$, $p < .001$) from pre to post-intervention compared to the wait-list

[5] Omega squared should be interpreted as, ω2 >.01 (small), ω2>.04 (medium) and ω2> .14 (large).

control group (t(65) = 4.99, p < .001). However, the Cohen d effect sizes that were reported for both groups were both large for the intervention group(d=.86) and for the control group (d=.62), suggesting that there was a significant decrease in both the intervention and control groups. In addition, a main effect of the intervention was reported in decreasing panic (ω2 = .06), with a moderate statistically significant decrease from pre to post intervention (p < .001, d = .54) compared to the control group (p = .14, d = .19) who showed no statistically significant change.

Participants in both groups showed a small statistically significant increase in school well-being (t(64) = −2.80, p = .007, d = .36 and t(65) = −2.64, p = .01, d = .33, for the intervention and control group respectively), in addition to a small statistically significant decrease in generalised anxiety (t(64) = 3.74, p < .001, d = .43 and t(65) = 0.94, p = .35, d = .11 for the intervention and control group respectively), from pre to post intervention. Thus, showing that there was no significant effect of the intervention on either well-being or anxiety (ω2 = .03 for both).

These results suggested, that although reported to be successful in reducing both test anxiety and panic, the intervention appeared to be effective with the latter. The intervention was not effective in increasing school well-being or decreasing generalised anxiety or panic.

Similar to the study in 2018, limitations should be considered when analysing these results. The STEPS intervention was created by the lead researcher in this study and therefore the reporting of the results that it was effective in reducing test anxiety, appears to exhibit researcher bias. Therefore, the researcher may have been likely to report results that were beneficial to themselves, particularly when reported their own work.

Furthermore, the results were representative of participants who were largely white (n= 105), with only 6 eligible for FSM. Therefore, these results do not represent all pupils in the UK and cannot be generalised. In addition, as with the earlier study, participants were made aware of the study and the content of the intervention.

The study also represented 101 females compared to just 39 males. As research within this review has shown, females at secondary age are more likely to experience anxiety which offers a reason for this difference. It does however suggest that results cannot be applied to males with test anxiety as they are underrepresented in the study.

Finally, whilst the researcher identified that there was a clear cut off score for those eligible for the study, participants were also considered if they were referred by a teacher. Whilst this would have been beneficial, as it would possibly have reduced the reliance of self-reporting of pupils regarding their anxiety needs, there was no clarity as to whether the needs of these participants were assessed using a teacher version of the anxiety scale.

A final study, which also supported findings by Putwain and Daly (2014) and Putwain and von der Embse (2021), was the only study to follow up and report on the impact of an intervention after two years (de Hullu et al., 2017).

In addition to assessing the impact of the interventions on anxiety, the study explored the impact on secondary outcome measures such as self-esteem, pro-social behaviour, implicit social-threat associations, fear of negative evaluations and interpretation bias. Pro-social behaviours are those which are intended to help others, such as empathy, whilst implicit social-threat associations are automatic threats that an individual perceives within a situation that are not clear or may not be

present. Fear of negative evaluation reflects the fear that is felt by an individual as being negatively viewed by those around them. Finally, interpretation bias involves an individual negatively interpreting events that would ordinarily be considered ambiguous, and catastrophising those which are deemed mildly negative. Thus a biased interpretation of social events can lead to heightened levels of anxiety, further strengthening their belief that they are incompetent within their social situation (Chen et al., 2019; Wells, 1995).

The Cognitive Bias Modification (CBM) intervention consisted of 20, 40-minute sessions, which were delivered twice a week via the internet. Tasks within the intervention were intended to modify interpretation and attention bias, strengthen the association between social-evaluative situations and positive outcomes and to enhance self-esteem.

In comparison, the CBT intervention consisted of ten weekly, 1.5-hour sessions delivered by a licensed psychologist at school. The intervention consisted of psych-education, task concentration training, cognitive restructuring, and exposure. Social anxiety symptoms were assessed using the social anxiety subscale of the RCADS and test anxiety was assessed using the Spielberger Test Anxiety Inventory.

240 participants aged 12-16, with moderate levels of anxiety, were randomised by school into one of three conditions (CBT: n=84; CBM: n=86; Control: n=70). Although at the end of the two years 121 participants remained, all data from 240 participants were assessed.

Although a significant decrease in the social anxiety and test scores of participants from pre-test to post test ($F(1,104.0) = 58.50$, $p < 0.001$ and $F(1,110.7) = 52.1$, $p < 0.001$ respectively), no significant interaction effect was found between the active

treatment conditions (F(2,166.2) = 0.45, p = 0.64 and F(2,179.6) =1.14, p= 0.32 respectively), indicating that there was no significant impact of the interventions in reducing test of social anxiety.

However, when exploring the effect of each active condition compared to the control group on interpretation bias, the results were significant for CBM (t(69) = -3.41, p = 0.001) but not for CBT (t(76) = 0.63, p = 0.53). Therefore, participants in the CBM condition reported larger changes in interpretation bias compared to the control group.

The results also indicated that although there was an increase in self-esteem and prosocial behaviour, a stable association to implicit social-threats and a decrease in fear of negative evaluation, these were not due to the interaction of either condition.

A large effect size was found at two years follow up in the control group (d=0.63), the (d= 0.86) and the CBM group (d=079) in regard to social phobia. A medium effect size was also found in the control group (d=0.46) and CBM group (d=0.65) compared to a large effect size in the CBT group (d=0.82) in regard to test anxiety.

The results from de Hullu et al, indicated that whilst a reduction in scores for test and social anxiety were seen from pre to post test, the interventions did not have a direct significant impact on reducing these. However, these findings may be due to participants not completing the full length of the intervention; on average 6.7 out of 10 CBT sessions and 8.5 out of 20 CBM sessions were completed. Therefore, without full length of the intervention, the impact may not be reflected.

Furthermore, the study also adopted cluster sampling as a method for randomisation which may provide less statistical certainty than simple randomisation and therefore the population of pupils may not have been equally represented within the clusters.

As in Putwain and von der Embse's (2021) study, the study overrepresented females with only 66 males participating. Therefore, it cannot be determined if the intervention was effective in reducing anxiety in males. In addition, 90% of participants were aged 13-14 and therefore the results can only be generalised for this age group within the Netherlands.

Due to the study reporting follow up findings, detail was not provided regarding the recruitment process of schools, the location that the participants represented or the SES background or ethnicity of participants, adding further limitations to the results.

As identified, only 50% of participants completed the two year follow up and therefore this was not reflective of the ongoing impact of the intervention on social anxiety, due to the high level of missing data. Furthermore, the outcome assessors were aware of the intervention which could result in possibly researcher bias and skewed results.

Overall, the results of the studies would suggest that interventions, in particular CBT, are ineffective in reducing anxiety in secondary-aged pupils with 75% reporting no effect. The studies in general are inclusive of varying cultural and SES backgrounds which means that the findings cannot be generalised to all pupils who experience anxiety, particularly to those in the UK. In addition, with 50% of the studies representing a higher number of females, the results cannot be used to interpret the effects of the interventions of both males and females.

The quality of the intervention studies are generally low, with one being particularly weak (Amin et al., 2020) in the methodology and reporting of results and a further study being identified as having a high risk of bias, particularly within the methodology (de Hullu et al., 2017). Although Putwain and von der Embse (2021)

offer a greater level of clarity and transparency in their study, the study cannot be fully replicated nor does it close the gaps within the research regarding the impact of interventions on anxiety. Specifically, the studies do not identify the effectiveness of interventions with male secondary participants as they were underrepresented within studies. Therefore, considering the quality of the studies and the results reported, it would indicate that concrete conclusions cannot be drawn as to whether these interventions are truly effective in reducing the levels of anxiety in secondary-aged participants.

Chapter 5: Discussion

5.0 Chapter overview

A systematic review methodology was undertaken to explore how anxiety was experienced by secondary-aged pupils and to evaluate the impact of school-based interventions (Cherry, 1998; Liberati et al., 2009). The 10 studies included in the review reported on a broad range of approaches to explore the different experiences and causes of anxiety and to evaluate school-based interventions. A summary of the overall findings of the studies included in the systematic review are presented in Table 11 and 12 (see appendix VI) which provide findings from exploratory and intervention studies respectively.

5.1 Summary of evidence

5.1.1 ***Research question 1.*** *What factors contribute to a secondary-aged pupils' experience of significantly elevated anxiety?*

1) How are significantly elevated levels of anxiety experienced between genders and what factors contribute to this?
2) What impact do significantly elevated levels of anxiety have on learning?

5.1.1.1 Gender differences

Overall, all studies exploring gender differences in the experience of anxiety were conclusive in identifying female levels of anxiety as being consistently higher than males. The results suggested that in particular, females experienced a greater level of separation anxiety, social anxiety, panic and GAD (Bakhla et al., 2013). Specifically, the results identified that females were more likely to experience separation anxiety following transitional stages than their male peers, and that this experience was likely to predict additional anxiety onset, such as social anxiety. Anxiety in males, however, was more likely to reduce over time (Grills-Taquechel et al., 2010). Furthermore, when exploring contributory components of anxiety, the findings suggested that females experienced higher levels of worry and tension. This gender difference was found to be in the same in varying school types such as single sex, integrated and state schools, indicating that anxiety levels are greater in females generally, regardless of school type (Mann & Walshaw, 2019).

Comparing these findings with existing literature, they are in line with previous data which identified that females experienced higher levels of anxiety at secondary age (NHS Digital, 2018). The findings are also in line with previous research which identified that, not only was anxiety found to be higher in females than males (Ford

et al., 2003), but that this anxiety can peak in adolescence (Field et al., 2001; Zahn-Waxler et al., 2008).

Although not explicitly identified, the findings can be interpreted as supporting previous research which argues that females present with internalised behaviours of anxiety compared to males who experience externalised manifestations (Emery, 1982; Zahn-Waxler et al., 2008). This may be due to the fact that many scales that are used to assess anxiety, such as the SPENCE anxiety scale, consist of statements about feelings rather than any behaviours that are exhibited. Therefore, if male participants are less likely to experience anxiety, it may be because the latter is not likely to be assessed. However, as no studies explored the difference in presentation of anxiety and only internalised factors were explored, this debate cannot yet be concluded.

Whilst the outcome showed that females were more likely to experience anxiety than males, very few studies sought to distinguish the *level* of anxiety experienced amongst secondary-aged pupils and between genders. It is surprising that only two studies reported the anxiety levels of female participants; reporting conflicting results with a very small number of females experienced any anxiety, which was low (Mann & Walshaw, 2019) to females more likely to experience moderate levels (Putwain & Daly, 2014). Therefore, whilst we are able to ascertain gender differences, it is unclear whether males or females are more likely to experience low, moderate or higher levels of anxiety. Whilst there are only two studies which identified varying levels of anxiety, they support the previous literature which has established that anxiety is not simply present or absent, but that there are varying degrees of anxiety which can fall along a calmness-anxiety scale (Joseph & Wood, 2010) and across a threshold (Burstein et al, 2014), thus affecting secondary-aged pupils in different

ways. As identified by recent research, there is a need for teachers to develop their knowledge regarding the experience of student anxiety within the classroom (Ginsburg et al., 2021). Therefore, the results from the review, helps teachers to understand that anxiety may be present in students, but that this may not be easily identifiable if it is experienced at a low level. Through this awareness that anxiety is present at varying levels, it will help teachers to reflect on their own practice and how they respond to a pupil's needs. Furthermore, it will allow EPs to work with teachers, to support them to adapt the classroom environment, as well as strategies that can be implemented within the setting, that may help to support all pupils experiencing anxiety.

In addition to establishing that anxiety is experienced across a continuum, the results from the systematic review highlight the importance of educational anxiety being recognised by all systems supporting secondary-aged pupils and challenges the DSM-5's clinical descriptions. 60% of the studies included in the review identified anxiety specifically related to learning, such as maths, science and test anxiety. This allows all systems to recognise that anxiety may be experienced by secondary-aged pupils that are not yet clinically diagnosable, and how these may impact on a CYP academic attainment. Therefore, one could argue that there is a need for the DSM to extend its classifications of anxiety to those which are prevalent within a learning environment and not just those which impact an individual's ability to cope in their social environment.

Although the characteristics of learning based anxieties could be argued to meet the criteria for 'specific phobia', the DSM only briefly comments on the educational context as being related to school avoidance. By extending the classification to subject based anxieties, it could provide teachers with a better understanding of the

needs of pupils within their class and how to target specific support for them. For example, if a class teacher is aware that, under the DSM classification, a pupil has a diagnosis of a specific phobia, but is not aware of *what* that phobia or anxiety is directly linked to, they will be less able to review their practice and the support that can be provided. By understanding what subject, the anxiety is linked to, the triggers can be identified, and school cultures and environments adapted to help reduce the CYP's experience.

5.1.1.2 Contributing factors of anxiety

Only one study reported on the impact of SES on anxiety and found that pupils reflective of middle-class backgrounds experienced greater anxiety (Mann & Walshaw, 2019). Whilst these results conflict with existing research, which has found no significance between SES and anxiety, (Draisey et al.,2019), it is not yet possible to conclude whether anxiety levels can be determined by SES alone. Unlike Draisey et al. (2019), the study by Mann and Walshaw (2019) did not explore whether pupils came from a single or nuclear family, which has been argued to determine the likelihood of a CYP experiencing anxiety, thus rendering this debate unanswered.

Furthermore, existing research has established that maternal anxiety and over-involvement impacts on their child's development of anxiety, however this was not explored within the studies included in the review. Whilst family factors were explored, with no exploration of parental needs it cannot be established whether existing anxiety needs in mothers could have caused the onset of anxiety in secondary-aged participants.

Previous research has also identified that a stressful home environment, such as hostile conflict resolutions and inconsistent disciplinary actions between parents, are

more likely to result in a diagnosis of anxiety (Emery, 1982). Whilst these appear to support the findings by Bakhla et al. (2013), who found that the experience of a dysfunctional family and more authoritative parenting styles contributed to higher levels of anxiety, the level of significance or effect cannot be determined and therefore a conclusion cannot be drawn regarding the effect of parenting and anxiety.

The results of two studies regarding the transitional stages within education, indicate this to be a predictor of anxiety. One study reported that during a transitional stage in year 6, pupils were more likely to experience greater levels of anxiety than two years later, where overall, anxiety levels decreased (Grills-Taquechel et al., 2010). Although not directly explored, Sağır (2012) suggested that participants who experienced anxiety at an older age, did so because this was also a transitional stage. The results from both studies also suggest that transitions predict the onset of additional forms of anxiety such as social and separation anxiety, which support existing research (Lester et al., 2013; Nowland & Qualter, 2020; Zeedyk et al., 2003). These findings are important in recognising that not only do transitions have an impact on the development of anxiety, but that this can affect a pupil at any age during their secondary education.

5.1.1.3 Constructs of anxiety

Two studies identified multi-dimensional constructs of anxiety, specifically with worry, tension, (Putwain & Daly, 2014) global self-worth and social acceptance (Grills-Taquechel et al., 2010). These findings are in line with previous research which identified that anxiety exists in the form of multi-dimensional constructs (Aydin, 2019; Harari et al., 2013; Pereira et al., 2012). As varying dimensions of anxiety were found across different studies, this highlights that anxiety can be experienced

differently by each individual and these constructs are important to explore, particularly for EPs, when working with a CYP.

Interestingly, a new dimension emerging from two studies proposing that school type had a significant effect on the development of anxiety (Mann & Walshaw, 2019; Sağır, 2012), specifically acknowledging that higher scoring (Sağır, 2012) and single sex and integrated schools (Mann & Walshaw, 2019), lead to an increase. With higher performing schools resulting in greater levels of anxiety in pupils, the interpretation of these results may be explained by the theory proposed by Wells (1995, 1997). When attending a higher performing school with higher achieving peers, it is possible that this triggers NATs and instigates a pupil's beliefs about how they will be perceived by others, their own self-beliefs and assumptions made about themselves, and placing unrealistic and higher standards and beliefs about their performance, thus elevating anxiety levels. Furthermore, if external values are placed on individuals regarding the importance of success, specifically when attending high achieving schools, this is also likely to increase the level of anxiety experienced (Pekrun, 2006).

However, the findings may also be explained by Beck's theory as participants in Mann & Walshaw's (2019) study, identified cloudy thoughts, suggesting a level of distortion with regard to their thinking. Although able to ascertain how and why school types may impact anxiety, these findings do not offer a conclusive overview as to which model or theory is more applicable to the development of anxiety in secondary-aged pupils. Therefore, supporting Well's view that there is no one theory or model that can be used to explain anxiety.

5.1.1.4 Impact of anxiety on learning

The most pertinent contribution of this review has been the link between learning and anxiety, of which there is a lack of research in the current field. Delgado et al. (2018) identified that compared to those without anxiety, pupils with anxiety had a poorer attitude towards learning and that anxiety impacted learning strategies, such as time management, concentration, selecting ideas and engaging in evaluative strategies. This appears to support previous findings by Harari et al. (2013) and Jarrett et al. (2015) who also identified that a lower attitude towards learning and lower skill level, resulted in higher levels of anxiety. Furthermore, the results of the review establish that pupils attending higher achieving school (Sağır, 2012) and integrated schools (Mann & Walshaw, 2019) are likely to experience greater anxiety than their peers. Existing literature identifies the need to support teachers to develop their emotional literacy, which not only refers to the awareness of pupils needs, but the need to be emotionally literate of the schools and their cultures, and how these impact anxiety (Perry et al., 2008). This requirement to develop emotional literacy within education is beneficial for pupil's academic performance as well as the prevention of health and well-being (Romasz et al., 2004). The results of the review stress the importance for staff within these settings to not only understand how anxiety can impact learning, but the impact the school culture can have on a pupil's experience with learning.

Mann and Walshaw, (2019) reported that testing was the cause of higher levels of anxiety as opposed to learning itself. Descriptions of these feelings provided by participants, supported previously identified cognitive models of anxiety, such as Beck et al. (1995), who proposed that there are four cognitive functions of anxiety which cause an individual to experience a clouded head or unclear thoughts.

This finding however contradicted alternative conditional theories such as (Watson & Rayner, 1920) who proposed that anxiety is a condition that is learnt from being

exposed to triggering stimuli. As identified by Mann and Walshaw's study participants identified that they had not been exposed to previous testing and therefore this had contributed to test anxiety. If the onset of test anxiety was understood by conditioning, one would expect that the lack of exposure to testing would not lead to a triggered response to the stimuli. Therefore, the conditional theory cannot be used in isolation, to explain the onset of anxiety amongst the participants in the study. A possible explanation for these findings may be supported by theories such as that proposed by Field et al. (2001), where individuals experience greater fear or anxiety when information is given to them by an adult or teacher compared to a peer. It is possible that in a classroom setting where teachers are likely to stress the importance of tests and the need to achieve, this may cause the onset of anxiety towards a stimulus that participants have not been previously exposed to.

The apparent contradiction of these findings, in regard to conditioning, suggests that consideration may be required for a combined theory of both conditioning and cognitive theories, when considering the onset of learning based anxiety. For example, anxiety may be triggered by the exposure to a given stimuli, such as school tests, however the intrusion of NATs maintains this level of anxiety and thus the two collaborate in its onset. As identified, participants in Mann and Walshaw's study (2019) were not exposed to tests, yet experienced anxiety towards them. They did, however, experience cognitive elements such as clouded thoughts and feelings when thinking about testing situations. Therefore, one could argue that the association of a testing scenario with the onset of automatic cognitive and psychosomatic symptoms, provides a situation in which the CYP is conditioned to experience anxiety in the future. By considering both conditioning and cognitive

theories, this will allow those supporting secondary aged pupils to not only reflect on how their own practice and responses may contribute to the onset of anxiety, but simultaneously, what cognitive elements may be further developing this experience and what support can be provided to alleviate this. Similarly to the study conducted by Mann & Walshaw, (2019), focus groups could be used to explore this further. Participants could be asked to identify if or what cognitive factors, such as NATs or catastrophising, are experienced during exposure to different situations, such as testing or school transitions, as well as being encouraged to retrospectively consider what experiences may have also contributed to the development of their anxiety. However, as previously identified with studies relying on retrospective accounts, the results would be dependent on the students remembering or being aware of events which lead to the development of their anxiety.

The findings from the systematic review also emphasises that the experience of anxiety in secondary-aged pupils is multifactorial and that this complexity must be considered when working with them. This supports elements of theories such as the Bio-ecological theory of human development (Bronfenbrenner, 2005), with research indicating that as well as the secondary-aged pupil's characteristics, such as a gender and age, external factors such as parenting, SES and school type (microsystem), student's attitude towards testing and achievement (macrosystem) and the time between transitions (chronosystem), also contribute to the experience of anxiety.

However, whilst some clarity has been provided regarding the systems within the Bio-ecological model and the effect on anxiety, it is clear that the results as a whole only somewhat support our understanding of how a secondary-aged pupil's microsystem and macrosystem can heavily influence the onset of anxiety. The bio-

ecological model theorises that human development is influenced by the surrounding systems within their environment (Bronfenbrenner, 2005). This analysis of the literature suggests that more emphasis needs to be placed on how these systems, outside of the classroom, contribute to the onset of anxiety associated with learning, as well as how they can be used to support anxiety. This would aid a teacher's understanding that although they cannot control what is occurring outside the classroom, the knowledge of these external elements can be used to influence their attitudes towards pupil experiences, as well as interventions. With only one study exploring SES (Mann & Walshaw, 2019), and one study reporting on parenting style (Bakhla et al., 2013), one cannot truly determine how these systems impact an individual's development of anxiety. Therefore, the analysis of the literature shows that further comparative studies are required to determine the extent to which these systems predict the onset of anxiety in secondary-aged pupils, in different contexts and countries. Furthermore, the results only offer an understanding through isolation of varying microsystems, and do not explore the interconnectedness of how these are likely to impact the individual. Upon development of the Bio-ecological model, Bronfenbrenner proposed that it is the complex relationship between the five systems that determine the CYP's development (Bronfenbrenner, 2005). This was well explored by Sağır, (2012) who found that not only were transitional stages (chronosystem) a key element in the experience of anxiety in secondary-aged pupils, but that the school type (microsystem) and the culture within it, namely the high achieving nature (macrosystem), resulted in greater levels of anxiety within students. It is therefore important that more research is conducted to explore the interconnectivity of the systems, so the development of anxiety within secondary-

aged pupils, can be ascertained and the knowledge used to support teachers within the learning environment.

Although the Bio-ecological model provides teachers with an understanding of socio-cultural stages of development, it may be more pertinent for teachers to consider the results by synthesising it with alternative models such as Erikson's Psychosocial Development Theory (Erikson, 1962). Erikson's' model explains how an individual changes and develops through their lifetime, with a focus on different ages. The results, which highlight how low self-esteem, self-worth and perceived social competence (Grills-Taquechel et al., 2010), as well as school type (Mann & Walshaw, 2019; Sağır, 2012) are likely to result in a greater level of anxiety experienced by secondary aged pupils, supports Erikson's view that between the ages of 5-12, pupils begin to develop their awareness of peers and seek to feel valued amongst society. If this does not occur, then a child begins to feel inferior and therefore reduces the belief of their own competence. Furthermore, when developing their sense of identity between 12-18, where students are intently exploring their goals and future, results from Mann and Walshaw (2019), provide teachers with knowledge that the pressures placed on them to be successful with examinations to enable them to progress towards career choices, are likely to increase their likelihood to experience anxiety. Therefore, whilst the results from the review provide some support for the Bio-ecological model in understanding that there are more systems around a secondary-aged pupil beyond the classroom, that must be considered when determining how anxiety can become significantly elevated, it is equally as important to recognise what psycho-social stages of a development a secondary aged pupil is experiencing that can also determine what contributing factors are likely to determine their experience of anxiety. Through this

understanding, professionals working with the CYP can consider the systems around them, and how these can be managed to alleviate anxiety levels. However, to fully attribute the Bio-ecological model to ensure holistic support is provided, further research into the exosystem, macrosystem, and chronosystem, must be explored and critiqued.

However, whilst the results of the review only allow for parts of the Bio-ecological to be considered when exploring the onset of anxiety, it does allow teachers to inform their own practice. For example, teachers are able to consider how lessons are planned to promote both academic achievement and maintain positive mental health in their pupils, by recognising and supporting anxiety in the classroom.

With a particular focus on the microsystem, the family is identified as being an important system supporting the development of a CYP. In line with previous literature highlighting that environmental factors, such as societal pressures and quality of social interactions can predict the onset of test anxiety (Foley et al., 2004), the results of the review show that not only is test anxiety present in secondary aged pupils, but that SES may also contribute to their experiences, with those from middle class backgrounds experiencing higher levels than their peers (Mann & Walshaw, 2019). When considering this alongside the macrosystem, namely the British education system which places high regard on academic achievement and qualifications, as well as the legal requirement for CYP to remain in education until 16 years of age, it is important that teachers acknowledge that not all pupils are surrounded by family networks that can support them academically. For example, pupils from differing SES backgrounds may not have access to the resources or the environment at home, required to prepare for an examination. Therefore, in a culture where high expectations regarding exam results are placed, when there is a lack of

support to prepare, increases the experience of anxiety. The results of the review, therefore, helps teachers to consider the need to ensure that lesson planning incorporates the teaching of strategies and revision techniques that can be used independently by secondary-aged pupils. For example the teaching of retrieval practice, where a pupil engages in mock-testing or answering spoken questions to retrieve information rather than to attempt to simply remember, which has been identified as an effective strategy to help reduce feelings of anxiety towards test situations (Agarwal et al., 2014).

When considering peers within the microsystem, the argument can also be made that the results promote the need for teachers to adopt different teaching techniques, such as group working, to include peer working to support secondary-aged pupil's experience of learning. This can help to reduce anxiety by removing pupil fear of judgement from teachers and peers, within a whole class setting, by providing a smaller, safer, and more contained space for pupils to learn. Research conducted by Baines et al, (2016) as part of the Social Pedagogic Research into Group-work (SPRinG) project, shows that implementing group work that is facilitated by teachers into the classroom, whereby pupils are required to work together to facilitate their own learning experience, positively contributes to their confidence as well as attitude to learning. By allowing pupils to support one another, it has been found to reduce the feeling of worry about asking the teacher for help, or fear of what other pupils would think of them if they answered a question during whole class learning (Galton, 2009). As identified by Delgado et al, (2016) pupils with anxiety had a lower attitude towards learning and that anxiety impacted learning strategies such as time management, concentration, selecting ideas and engaging in evaluative strategies. Therefore, by adapting teaching strategies to promote learning attitudes, whilst

promoting the use of systems within the microsystem to support secondary-aged pupils, this may reduce the anxiety experienced within the classroom.

Furthermore, the argument could be made for the results of the review to encourage Government policies to be explicit in their requirement for test anxiety to be considered within the learning environment. This could allow teaching strategies and classroom practice to be adapted to reduce the risk of a pupil's anxiety, resulting in the avoidance of school. Research by Roberts-Holmes and Bradbury, (2016; 2017), identifies the increased requirement for data to be submitted regarding pupil attainment, due to Government policies. These assessments, which begin as early as the Early Years stage of education in the form of Baseline Assessments, are described by Roberts-Holmes and Bradbury, as determining future education and employment possibilities, thus reducing education to a "commodity" that increases an individual's usefulness and ability to contribute to society. As identified by Mann & Walshaw, (2019), secondary-aged pupils experience test anxiety without having been exposed to a secondary-school level of examinations. One can therefore infer that this fear of testing has been conditioned following experiences from an early age. Consequently, secondary-aged pupils are constantly aware, throughout their educational experience, of the need to succeed and the importance that society places on academic success, through attainment. It is important, therefore, that Government policies review the expectations placed on academic attainment and success, and how pupils can be supported within the classroom. For example, an emphasis on teaching that supports secondary-aged pupils to achieve what they are capable of, rather than an emphasis on grades and scores, thus alleviating the anxiety experiences in relation to achievement and academic success.

Additionally, policies may seek to provide a focus on achievement beyond scores and grades, and to work with pupils to be aware of alternative options which equate to academic success, such as apprenticeships or training. This may help to reframe the narrative as to what academic success is considered to be and reduce the experience of anxiety in secondary-aged pupils.

Finally, the results are important in helping teachers to understand how school cultures and secondary-aged pupils experiences of anxiety can contribute towards learning anxiety and inform possible experiences, such as Emotionally Based School Avoidance (EBSA). EBSA refers to the challenging experience of a CYP, in attending school due to emotional and psychological distress and negative feelings, such as anxiety (Ogilvie et al., 2019). Whilst there is knowledge that anxiety is part of a pupil's experience of EBSA, the result of the review provides teachers with the knowledge of the precursors of anxiety linked to learning, and how this may contribute to an experience such as EBSA. As existing literature has identified, the experience of anxiety at school leads to a withdrawal from learning and can result in an incomplete education with no qualifications, thus limiting future prospects (Kessler et al., 1995). As previously identified, the DSM-5 briefly recognises that anxiety can be linked to school avoidance, however it does not identify why this may occur. The experience of EBSA can be explained by existing theories, such as Ekman's Theory of Basic Emotions (Ekman, 1999), which states that as humans, it is our innate response to avoid and reduce perceived 'negative' emotions, such as fear or anxiety, and seek to heighten 'positive' emotions, such as contentment, relief and satisfaction. Therefore, when presented with a situation that arouses 'negative' emotions, specifically linked to their learning environment, this can result in a pupil disengaging from learning and avoiding school. It is important for these theories to

be considered, when analysing the results from Delgado et al, (2016) and Mann & Walshaw, (2019), who found greater levels of anxiety associated with testing, in addition to lower attitudes towards learning, time management and concentration. Without the necessary support within the classroom to reduce the experience of learning related anxiety, secondary-aged pupils may be at greater risk of disengaging from school, in a bid to reduce these negative feelings. It is therefore important for teachers to not only understand the need to adapt their learning environment to meet the needs of secondary-aged pupils, but how learning based anxiety can contribute to the experience of school avoidance, such as EBSA.

5.1.2 ***Research question 2.*** *How are school-based interventions effective in enabling secondary-aged pupils to manage significantly elevated levels of anxiety?*

Of the four studies, one explored the impact of interventions on social anxiety (Amin et al., 2020), two on test anxiety (Putwain & Pescod, 2018; Putwain & von der Embse, 2021) and one on a combination of social and test anxiety (de Hullu et al., 2017). All studies evaluated the impact of the intervention on anxiety, with one study assessing the impact of the intervention on self-esteem and cognitive errors such as automatic threat associations and fear of negative evaluation (de Hullu et al., 2017).

Generally, the studies concluded that CBT interventions did not have a significant impact on the reduction of anxiety, with 75% reporting no effect (de Hullu et al., 2017; Putwain & Pescod, 2018; Putwain & von der Embse, 2021). This may be due to the fact that participants were identified as having varying levels of anxiety and therefore the intervention may not have been as significant for those with low or medium levels. The same three studies did report a decrease in levels of anxiety such as social and test (de Hullu et al., 2017; Putwain & von der Embse, 2021) and symptoms such as bodily symptoms and irrelevant thoughts (Putwain & Pescod,

2018), within the intervention groups, however these were not a direct impact of the intervention themselves. These findings support some of the existing research which also established that CBT interventions were successful in reducing anxiety scores, however had no impact on anxiety levels (Miller et al., 2010). However, the results do not support the majority of existing literature, which reported a decline in anxiety due to the intervention (Fjermestad et al., 2020; Ginsburg & Drake, 2002), including studies which sought to explore alternative programmes to CBT (Alanazi, 2020; Masia et al., 2001), compared to those in the control group. This may be due to the fact that the interventions, although CBT, were not all administered in the same way across studies. Therefore, to understand if CBT is effective, it would require the same programme to be conducted in the same way with pupils in different settings and locations.

Although the studies did not find a significant effect of the intervention on anxiety, they all reported a decrease in bodily symptoms, fear or negative evaluation and irrelevant thoughts, which shows that the interventions were effective in reducing contributing factors. In addition, the results suggest that one intervention was successful in reducing uncertain control (Putwain & Pescod, 2018) which, as proposed by the control-value theory (Pekrun, 2006), could help to alleviate anxiety levels. Therefore, by increasing one's perceived level of control, it is likely to decrease the level of anxiety experienced.

Therefore, the results are important for teachers and EPs to understand that although CBT may not be effective in reducing anxiety levels in secondary-aged pupils, it can be used to reduce elements specifically related to learning. For example, with regards to uncertain control (Putwain & Pescod, 2018), one could view this as a contributory factor of test anxiety, as pupils are not able to determine the

outcome of their revision or work during the exam and therefore, CBT can be used to support these anxious feelings prior to an examination. For example, a pupil may believe that unless they prepare and revise seven hours per day until the examination, they will fail, thus increasing their anxiety. The CBT intervention can help to explore this view and identify that although they cannot control the mark or grade achieved, they can control the effort they have put into preparing for the exam. When exploring the possibility of carrying out a CBT intervention with a pupil, it is pertinent that the underlying factors contributing to anxiety are explored by teachers or EPs, to ensure the intervention is effective.

Consideration should be given to the settings in which the interventions were delivered. Although existing research exploring the impact of interventions conducted in a school-based setting offers varied levels of effectiveness, interventions conducted in clinical settings have reported reduced levels of anxiety in participants (Butler et al., 2006). Therefore, a low level of effectiveness may be attributed to CBT interventions outside clinical settings. The studies included in the review adopted different methods of delivery of the intervention; one study delivered the intervention via the internet (de Hullu et al., 2017), one required participants to become their own therapist (Amin et al., 2020) and two delivered the intervention via assistant psychologists who were not specified as having had training in delivery of the intervention (Putwain & Pescod, 2018; Putwain & von der Embse, 2021). These methods of delivery differed from CBT in a clinical setting, suggesting, not unexpectedly, that the fidelity of the CBT intervention risked being compromised significantly when delivered within a school-based setting, by inadequately trained practitioners, with the impact of the intervention contingently attenuated.

Furthermore, the low level of effectiveness of a school-based CBT intervention appears consistent with other research which highlights the necessity for the inclusion of exposure to a feared stimuli, in order for the intervention to reduce anxiety levels (Whiteside et al., 2020). Only one study included exposure techniques to reduce social anxiety levels (Amin et al., 2020), which found the intervention significantly reduced anxiety in secondary-aged participants. Whilst a reduction in cognitive symptoms was experienced by participants (Putwain & Pescod, 2018; Putwain & von der Embse, 2021), the absence of exposure to feared stimuli provides a strong explanation as to why a significant overall intervention effect upon their experience of anxiety was not found.

Therefore, these findings indicate that, whilst it is possible to reduce *symptoms* of anxiety, in order for a CBT intervention in a school-based setting to be effective in contributing toward significant, sustained, overall reductions in the levels of anxiety experienced by secondary-aged students, requires exposure techniques, and cannot rely on cognitive or relaxation techniques alone.

None of the studies sought to explore any gender differences when evaluating the impact of interventions of secondary pupils. With existing literature identifying females as experiencing higher levels of anxiety to males, the level of impact that interventions have between genders cannot be determined. However, this may also be an explanation as to why this has not been explored. With more females identified as experiencing anxiety, it may not be possible to recruit an equal number of males and females to the study to determine gender effects.

Additionally, all studies explored the impact of CBT interventions on anxiety, however none sought to explore alternative programmes, such as SASS (Masia et

al., 2001), therefore remaining inconclusive as to how all forms of school-based interventions impact anxiety. From the number of studies excluded from this review, it seems that studies exploring alternative school-based interventions have been conducted with younger aged participants or those spanning across both primary and secondary school, but not yet with only secondary-aged participants.

Chapter 6: Conclusion

6.0 Chapter overview

This chapter will conclude the overall findings of the studies before identifying the limitations of the review process. In addition, limitations of the review itself will be reported, followed by the implications for educational professionals and possible areas of future research.

6.1 Conclusions identified from the studies included in the review

Overall, the findings from the systematic review, exploring the experience of anxiety and the impact of interventions with secondary, are generally conclusive. The studies report that females experience anxiety at a greater level than male peers and that CBT interventions have no direct effect on reducing anxiety levels, however, reduce symptoms which contribute to the onset. Studies also provide clear findings that anxiety is a multi-dimensional construct and can be linked to transitions, testing, parenting styles and the type of school attended. In addition, learning ability and attitude to learning are identified as contributing factors to anxiety.

However, it remains undetermined as to how contributing factors such as SES or parenting styles impact anxiety. Although gender differences have been identified, it is not yet clear if there are any differences in externalised or internalised behaviours nor the difference in the level of anxiety experienced. Furthermore, the results have not been conclusive in identifying the impact of all school-based interventions other than CBT.

6.2 Limitations of the review process

Various limitations should be taken into account when considering the results in this systematic review.

6.2.1 Scope

As a result of the systematic literature search, the studies included in the review were all quantitative in nature, except Mann and Walshaw (2019) which adopted a mixed method approach. The inclusion of qualitative data would have been beneficial as it provides evidence to understand how and why an intervention is effective, thus providing richer data. In addition, it provides clearer identification of gaps within the literature and helps to identify themes, theories and insights to be gained (Boland et al., 2017).

As studies were searched electronically, only those that were made available could be assessed for their suitability, thus eliminating any potential studies that were available if explored manually. In addition, studies can only be reported in a systematic review that have been made publicly available. As stated by Blok (1999), studies with more desirable results are more likely to be published and therefore it is not possible to ascertain how many potentially suitable studies may have been unavailable due to their unpublished status. It would, therefore, be beneficial in future research, for searches to be conducted manually as well as electronically.

Consideration should also be given to studies that may have been relevant to the review, however the full text could not be retrieved electronically for reasons unknown. These studies may have possibly altered the results in the review and to the conclusions that could be made.

The inclusion criteria presented possible limitations to the studies included. Firstly, studies that explored interventions were only included if they were school based. Therefore, eliminating any potentially relevant studies due to being clinically based.

Another limiting factor was that studies were only included if they were published in English. This resulted in two studies being excluded from the review and due to searches being carried out on English data bases, additional potential results may have been unavailable.

As studies were required to have comparison groups to yield more reliable data, those that contained an alternative method, such as interventions for individuals, were not entered into the review. For example, 43 studies were excluded from the review for this reason, which may have offered data which impacted on the results.

Furthermore, studies were excluded if participants were not aged 11-16 years, to ensure the search for studies was more refined. Thus, eliminating studies that may have altered results within the review. The number of studies included in the review suggests that the inclusion criteria may have been too narrow and did not allow for more relevant papers to be extracted.

Finally, studies were only accepted where there was an appropriate measure of anxiety made prior to participation, thus eliminating studies where alternate identification of anxiety were made.

6.2.2 Process

Due to the varying levels of data presented in the systematic review, a meta-analysis could not be undertaken. A meta-analysis would allow for the results of any study to be understood in the context of others. Therefore, a narrative analysis did not allow for any variance and possible implications to be considered (Borenstein & Hedges, 2009).

It had been intended for all members of the research team to engage in the screening process of studies included in the review, however this was not possible

due to time restraints as the research timeline was impacted by the outbreak of the global pandemic. Although 54 papers were shared with the team due to them being determined as uncertain, the remaining papers were screened independently which may have resulted in a greater level of error or bias than those screened by a research team. It would be useful for future research to ensure that more than one researcher screens the studies to ensure a robust selection are included.

6.3 Limitations of studies included in the systematic review

Generally, the sample sizes of the studies were small and therefore findings could not be generalised to a larger population, with only two studies included more than 1,000 participants. In addition, smaller sample sizes may have contributed to small effect size found in studies as impact or correlations could not be determined with the number of participants.

All of the studies relied upon participant self-assessment. As identified by Ford et al. (2003) clinical diagnosis increased for children when teacher information was provided in addition to child information. Therefore, the self-assessments may not have been representative of the number of participants with anxiety as the symptoms may not have been recognised (Griffiths & Fazel, 2016). It may have been more beneficial to ensure that studies included in the review included at least two forms of assessment to remove any possible bias or mis-identification of existing needs.

Due to the results of the literature search, only studies exploring CBT interventions were reviewed. Therefore, excluding the possibility of reviewing any interventions that engaged in an alternative programme. For example, previous research shows that, non CBT interventions such as ARMG helped to reduce the levels of anxiety experienced by pupils (Alanazi, 2020).

The studies included also compared and assessed a range of anxieties and this must be borne in mind when generalising results. Furthermore, as all studies did not report effect sizes and reported findings through a range of statistics, it would have been more beneficial to have included only studies that reported the effect size, so clear comparisons could be made across all results.

Finally, the studies included in this review were conducted in a range of countries, and therefore results could not be generalised to pupils attending secondary school in the UK. Future research may seek to include studies that are conducted in the UK, so these results can be applied to the population that will be worked with by EPs.

6.4 Strengths of the studies included in the systematic review

The studies included in the review have a range of strengths that have contributed to the results of the systematic review. Firstly, the studies included within the review are reflective of different cultures such as India (Bakhla et al., 2013), England (Putwain & Daly, 2014) and Pakistan (Amin et al., 2020). With 90% of England's ethnic groups being made up of White, Indian and Pakistani individuals (Office for National Statistics, 2011), the results from these studies are important in identifying that in spite of cultural influences or backgrounds, anxiety is more prevalent in females than males, which can then be applied to the general British population.

The study conducted by Bakhla et al (2013) explored multiple forms of anxiety such as, generalised, separation, social phobia, and agoraphobia, which provided results that were generalisable to a greater population of secondary-aged pupils who experienced anxiety. Furthermore, researchers administered the SPENCE scale to determine whether participants experienced anxiety. Although conducted in India, as a readily available assessment tool, this allows for the study to be easily replicated

within the UK to determine how multiple forms of anxiety are experienced by secondary-aged pupils and what may contribute to this. Similarly, Delgado et al (2016) provided clear rationale for their study, with specification of the inclusion criteria, comparing pupils with and without anxiety. With a clear aim and hypothesis, as well as robust methodology, this also allows for the study to be replicated within the UK. However, care should be taken for such studies as they include cultural differences, such as the obligatory secondary school age in Spain which begins at 12 years, unlike 11 years in Britain. Unlike Bakhla et al (2013) and Delgado et al (2016), Putwain & Daly (2014) is a UK based study, which explored anxiety within a UK population. Although only representative of 11 schools in North-West England, the study's robust methodology, clear inclusion criteria and the inclusion of varying levels of anxiety, means that it can be easily replicated within the UK, to allow for results to be generalised across the country.

A further strength of the intervention studies included in the systematic review, is that they are all RCT in design. Whilst this was a specified inclusion criteria, the inclusion of RCT studies meant that all participants had an equal chance of being included in the intervention and thus reducing the level of research bias and offering more reliable results (Gutman, 2009).

Additionally, as the results are reflective of secondary-aged pupils within a school setting, the studies have allowed for non-clinical factors such as school transitions and school type, to be explored. With the inclusion of such studies, it is possible to extend knowledge and understanding of how school transitions are likely to exacerbate the onset of anxiety in secondary-aged pupils (Grills-Taquechel et al., 2010) and how this may also affect a CYP's academic achievement, causing them to become unmotivated and lack interest in their learning (Delgado et al., 2018); factors

which could not be explored in a clinic-based study, thus providing far greater external validity to the studies included in this review.

Finally, the studies explore a range of anxiety types such as test anxiety (Putwain & Daly, 2014), maths anxiety (Mann & Walshaw, 2019) and science anxiety (Sağır, 2012), extending beyond the clinical definitions provided by the DSM-5(APA, 2013). Similarly, as mentioned previously, within clinic-based studies, such anxiety types may not have been adequately explored and therefore the inclusion of such studies extends the scope of what types of anxiety may be present in secondary-aged pupils, and the implications in respect of this in relation to learning. Furthermore, this allows for an exploration of the different contributory factors, to be associated with more than one anxiety type. For example, transitions and the onset of separation or social anxiety (Grills-Taquechel et al., 2010) or that CYP who do not receive the appropriate level of academic support, may be more likely to experience science anxiety compared to their peers (Sağır, 2012).

6.5 Implications of the systematic review

6.5.1 Implications for practitioners and educational psychologists

This review offers an insight into the onset of anxiety amongst secondary-aged participants and would be useful to consider for those working with pupils aged 11-16 years of age. The review enables educational professionals to have an awareness of how anxiety is experienced in secondary-aged participants, specifically between genders. Furthermore, it provides some clarity of likely contributing factors and how effective interventions are in alleviating anxiety levels.

EP work must reference Government legislation and agendas such as The Mental Health of Children and Young People in England (Public Health England, 2016) and

Future In Mind (Department of Health, 2012). These policies highlight the importance for the child, their family, school, and the community to be identified as both risk and protective factors in the development of anxiety. EPs must, therefore, work within their local community setting, inclusive of schools, to ensure that every child is supported in being safe, healthy, and developing life skills ready for adulthood. Consequently, EPs are often required to adapt to the changing mental health topics, to meet the needs of the educational setting in which they work in. With the results from the review establishing a link between anxiety and learning, it will be important for EPs to use the findings to support teachers' understanding that anxiety exists on a scale and how the school culture or learning environment may be impacting upon these levels. EPs can assist teaching staff to adapting their teaching practice and the school environment, to help reduce anxiety provoking stimuli. For example, exploring how lessons are delivered, so they utilise peer group learning that is supervised by the teacher (Baines et al., 2016) or ensuring that pupils experiencing difficulty with learning are adequately supported to reduce the level of anxiety experienced (Sağır, 2012).

This support can be provided via consultations or whole school training opportunities, which links underlying psychological models and theories, Ekman's Emotion Based theory (Ekman, 1999), to secondary-aged pupils approach and attitude towards learning (Delgado et al., 2016). In doing so, teachers will be aware of the need for pupil's basic needs to be met within their learning environment and how they are likely to disengage from learning in an attempt to reduce negative emotions. Within this training, it will be important for EPs to share how learning anxiety is related to experiences such as EBSA, and to work with teachers to identify

strategies that can be incorporated to support not only those with clear identified anxiety needs, but those who are experiencing anxiety at a lower level.

EPs are also in the best position to support schools with policy and planning development, particularly in understanding how anxiety can be reflected within a pupil's learning and how this should be supported. For example, understanding how transitions impact anxiety (Grills-Taquechel et al., 2010), EPs can work with schools to consider adapting their transition planning for pupils starting year 7, building on existing theories, such as 'Matching' theory (Galton, 2009), whereby the school environment is adapted to fit the pupil's psychological needs.

With EPs approaching casework in a variety of ways, such as consultation models (Wagner, 1995), direct work, or through supporting professionals working with CYP, they could be considered to be best placed to not only support teaching staff with their understanding of how learning anxiety occurs, but to deliver CBT in such an environment (Squires, 2010). Under these contexts, EPs are able to offer their knowledge of evidence based psychological theory. With a greater understanding of how CBT can be used to target learning based anxiety, EPs are able to use this knowledge when working with parents and professionals, to ensure interventions are tailored and specific to the needs of the pupil. Furthermore, as research has identified that CBT interventions are more effective in reducing anxiety when they include exposure to a feared stimulus, such speaking in front of groups, EPs are able to consider the possibility of this when planning a CBT intervention with CYP. This will enable EPs too work with schools to identify what exposure is ethical within the school-based context. Where this is not felt to be ethical, it will be important for EPs to assess the symptoms of anxiety experienced by each YP who requires access to an intervention, so that it is clear what is being supported during the intervention.

With this knowledge, it is also important that the outcome of the intervention is made clear to key stakeholders such as parents/carers or teachers, so expectations are managed as to the efficacy of the intervention.

When considering the delivery of CBT, EP's must ensure that no harm comes to those who they are supporting and that the possession of appropriate skills and care are acquired to serve stakeholders (The British Psychology Society, 2018). EPs must also be aware of their limitations of their professional competence and skills (DECP, 2002). As identified by the review, a possible lack of effectiveness within three studies (de Hullu et al., 2017; Putwain & Pescod, 2018) may have been due to the level of knowledge and expertise of the individual delivering CBT. Therefore, it is important that an EP does not engage in the delivery of an intervention if they are not skilled to do so, so that this does not hinder the success of the effects; considering the need to gain additional qualifications to ensure CBT is delivered effectively (Hammond & Palmer, 2021).

Furthermore, given that the cost of an EP can be considered a costly resource to schools, one could argue that with the implementation of MHST's within all schools, who are no additional cost, teachers may be best placed to provide this level of therapeutic intervention with the knowledge of how effective CBT is in supporting anxiety. Should EPs not be the ones to deliver the intervention, they will be best place to advise schools as to how to best implement this and what core elements are required to ensure effectiveness. For example, possible exposure to feared stimuli and targeting symptoms of anxiety rather than aiming to reduce anxiety levels themselves.

However, consideration will need to be given to how this information can be delivered within services that are not traded. A traded service carries out statutory work as outlined in the Special Educational Needs and Disability (SEND) Code of Practice (Department for Education & Department of Health, 2015) and work purchased by schools through the buyback service. Without the possibility of delivering training to schools through a traded model, it will be important for EP services to consider alternate methods of delivery, such as production of a published document available to schools or solitary training that is offered to the local authority. For those who offer a partially or fully traded service model of delivery, EPs are able to move away from school-based assessments and expand their reach to support the community within varying contexts such as, social care, private settings and multi-agency working, within the local authority and community (Fallon et al., 2010; Lee & Woods, 2017). This will allow EPs to deliver systemic training using the evidenced based results of the review, to a wider range of individuals, who are also in a position to support CYP.

Finally, by extending EP support within a multi-agency context, it will allow the varying systems around the CYP to be aware of what may be contributing to the development of anxiety and what steps can be taken to prevent or support them. For example, it would be beneficial for all EPs to explore and discuss family and social factors surrounding a child or young person when engaging in assessment and consultations with parents/carers or professionals such as social workers, particularly parenting style. This eliminates the view of a within child cause and helps to understand the impact of external factors on the development of anxiety. Appropriate support can then be identified and offered to parents/carers, providing systemic support for the CYP.

6.5.2 Implications for future research

The review has identified many potential paths for future research. In general, it would be useful for a systematic review to be conducted with a larger sample of studies to allow for results to be generalised.

As the review is aimed at educational professionals included EPs who work with individuals aged 0-25, it would be beneficial for a review to be carried out with this broader age range, to inform professionals about how they can be supported. This would also provide a comparison of the experience of anxiety across age ranges to conclude whether anxiety is more prevalent at secondary age. This knowledge may allow EPs to put in place preventative measures, if necessary, at earlier stages of a young person's education.

A qualitative review would be beneficial in exploring reasons for the experience of anxiety and how these might differ amongst age and gender. It would also be useful to explore and compare the impact of interventions that are aimed at an individual, group and whole class level, to assess the effectiveness of each and help to inform future EP recommendations.

As this review is aimed at the UK school system, it may be useful to explore differences in anxiety from studies conducted in this country so that results can be generalised to the population.

Furthermore, it would be beneficial for a meta-analysis to be conducted, as this could explore interventions in greater depth and provide a more comparable data set using similar results from varying studies. This is done by comparing effect sizes, which can be "statistically synthesised" to determine the overall effect as well as the effectiveness on different groups (Hattie, 1999). Within a meta-analysis, the effect

sizes are calculated using the differences between the means of the intervention and control group, or the differences in means between the pre-test and post-test scores. These are then divided by the total standard deviation (Hattie et al., 1996). This allows for a large amount of data to be analysed and in turn may detect small, yet significant, differences in the findings of individual RCTs (Boland et al., 2017). As meta-analyses include studies with effect sizes which are directly comparable, this reduces the possibility of error in interpretation from the researcher, and thus makes the data more reliable and applicable to education professionals, including EPs. The use of a meta-analysis removes the possibility of studies being selected at the researcher's discretion, as a clear inclusion and exclusion criteria must be adhered to (Wolf, 1986) To conduct this successfully, studies eligible for review would require the same method of statistically analysing data; for example, reporting the same effect sizes. This would allow for clear comparisons to be made between the studies and offer greater clarity when reporting the results. Secondly, the studies included in the meta-analysis must compare the same intervention to ensure that the exposure is compared like for like. Furthermore, it would be useful for studies to be exploring the same outcome such as the effectiveness of CBT interventions or whether transitions impact anxiety within secondary-aged pupils to ensure that it is possible to report on one outcome and offer a robust, evidence based answer to the research question (Boland et al., 2017). By conducting a meta-analysis, it would allow for a more accurate method of analysis, which sheds light on specific confounding factors, such as the characteristics of the study or failure to moderate variables between the intervention and anxiety, which may cause a variation in the effectiveness of an intervention (Wolf, 1986)

Future research may seek to consider the use of blind-trails or double-blind trials to explore how effective interventions are in supporting secondary-aged pupils. A single blind-trial is one in which the participant is not aware of the group they have been assigned to and therefore do not know if they are receiving the intervention or are part of the control. A double blind-trial, involves neither the participant nor researcher knowing which group the participant was part of (NICE, 2021). By including blind-trials, results are likely to be more reliable as they remove the risk of either participant or researcher bias.

An exploration into the effectiveness of non-CBT, school-based interventions would provide a true reflection of the impact on anxiety and allow EPs to make better informed recommendations to schools. In addition, it would be useful to understand the effect of school-based interventions between genders.

Further research is required to provide a clearer understanding of how contributing factors such as maternal anxiety and SES are likely to impact anxiety levels. It is also important that future research explores whether and how world events such as COVID-19, have influenced secondary-aged pupils' experience of anxiety and whether interventions are successful in supporting them. Understanding the long-term impact of such events, will allow educational professionals not only to consider additional factors influencing anxiety, but explore how interventions can be used to support students effectively in responding to such events and mitigating their potentially harmful effects.

Finally, although gender differences in anxiety have been found, additional research could explore to what level the anxiety is experienced amongst secondary-aged participants and if these are presented through internalised or externalised

behaviours. This would allow EPs and educational professionals to identify anxiety more accurately.

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Zeidner, M. (1998). *Test Anxiety: The State of the Art*. Springer Science & Business Media.

Appendices

Appendix I: Completed PRISMA checklist.

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Title Page
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Abstract
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	14-18
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	22
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	69
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	83
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	73-74
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	68-85
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	68-85
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Appendix III
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Appendix IV
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	79
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Appendix II
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	69
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data	N/A

Section and Topic	Item #	Checklist item	Location where item is reported
		conversions.	
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	N/A
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	N/A
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	N/A
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	N/A
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	79
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	N/A
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	87
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	87
Study characteristics	17	Cite each included study and present its characteristics.	88-95
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	96-100
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	100-128
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	88-100
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	100-128
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	100-128
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	100-128
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Appendix V
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	100-128
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	133-137
	23b	Discuss any limitations of the evidence included in the review.	141-142

Section and Topic	Item #	Checklist item	Location where item is reported
	23c	Discuss any limitations of the review processes used.	138-141
	23d	Discuss implications of the results for practice, policy, and future research.	142-145
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Appendix II
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	68
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	N/A
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	N/A
Competing interests	26	Declare any competing interests of review authors.	N/A
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	N/A

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

For more information, visit: http://www.prisma-statement.org/

Appendix II: PROSPERO registration form.

PROSPERO
International prospective register of systematic reviews

NHS
National Institute for Health Research

UNIVERSITY of York
Centre for Reviews and Dissemination

Systematic review

1. * Review title.

Give the title of the review in English

How do secondary aged pupils experience anxiety and how effective are school-based interventions in supporting them? A systematic review.

2. Original language title.

For reviews in languages other than English, give the title in the original language. This will be displayed with the English language title.

3. * Anticipated or actual start date.

Give the date the systematic review started or is expected to start.

01/10/2020

4. * Anticipated completion date.

Give the date by which the review is expected to be completed.

01/06/2021

5. * Stage of review at time of this submission.

Tick the boxes to show which review tasks have been started and which have been completed. Update this field each time any amendments are made to a published record.

Reviews that have started data extraction (at the time of initial submission) are not eligible for inclusion in PROSPERO. If there is later evidence that incorrect status and/or completion date has been supplied, the published PROSPERO record will be marked as retracted.

This field uses answers to initial screening questions. It cannot be edited until after registration.

The review has not yet started: No

Review stage	Started	Completed
Preliminary searches	Yes	Yes
Piloting of the study selection process	Yes	Yes
Formal screening of search results against eligibility criteria	Yes	Yes
Data extraction	Yes	Yes
Risk of bias (quality) assessment	Yes	Yes
Data analysis	Yes	Yes

Provide any other relevant information about the stage of the review here.
Protocol has been completed and ethics has been approved.

Protocol has been completed and ethics has been approved.

6. * Named contact.

The named contact is the guarantor for the accuracy of the information in the register record. This may be any member of the review team.

Taj Braich

Email salutation (e.g. "Dr Smith" or "Joanne") for correspondence:

Mrs Braich

7. * Named contact email.

Give the electronic email address of the named contact.

t.athwal@ucl.ac.uk

8. Named contact address

Give the full institutional/organisational postal address for the named contact.

20 Bedford Way, London WC1H 0AL

9. Named contact phone number.

Give the telephone number for the named contact, including international dialling code.

[redacted]

10. * Organisational affiliation of the review.

Full title of the organisational affiliations for this review and website address if available. This field may be completed as 'None' if the review is not affiliated to any organisation.

UCL Institute of Education

Organisation web address:

11. * Review team members and their organisational affiliations.

Give the personal details and the organisational affiliations of each member of the review team. Affiliation refers to groups or organisations to which review team members belong. **NOTE: email and country now MUST be entered for each person, unless you are amending a published record.**

Mrs Taj Braich. UCL Institute of Education
Dr Emma Sumner. UCL
Dr Jermey Monsen. UCL Institute of Education/Royal Borough of Kensington and Chelsea
Dr Amelia Roberts. IoE

12. * Funding sources/sponsors.

Details of the individuals, organizations, groups, companies or other legal entities who have funded or sponsored the review.

IoE

Grant number(s)

State the funder, grant or award number and the date of award

13. * Conflicts of interest.

List actual or perceived conflicts of interest (financial or academic).

None

14. Collaborators.

Give the name and affiliation of any individuals or organisations who are working on the review but who are not listed as review team members. **NOTE: email and country must be completed for each person, unless you are amending a published record.**

Dr Emma Sumner. UCL Institute of Education
Dr Jeremy Monsen. UCL Institute of Education/Royal Borough of Kensington and Chelsea
Dr Amelia Roberts. UCL, Institute of Education

15. * Review question.

State the review question(s) clearly and precisely. It may be appropriate to break very broad questions down into a series of related more specific questions. Questions may be framed or refined using PI(E)COS or similar where relevant.

How do secondary age pupils experience anxiety?

16. * Searches.

State the sources that will be searched (e.g. Medline). Give the search dates, and any restrictions (e.g. language or publication date). Do NOT enter the full search strategy (it may be provided as a link or attachment below.)

The following will be searched:

• British Education Index (BEI);

• Education Resource Information Centre (ERIC);

• Web of Science;

• PsycINFO.

Studies must have been carried out and published between 2010 and 2021, and must be written in English.

Additional search strategy information can be found in the attached PDF document (link provided below).

17. URL to search strategy.

Upload a file with your search strategy, or an example of a search strategy for a specific database, (including the keywords) in pdf or word format. In doing so you are consenting to the file being made publicly accessible. Or provide a URL or link to the strategy. Do NOT provide links to your search **results**.

https://www.crd.york.ac.uk/PROSPEROFILES/203941_STRATEGY_20201201.pdf

Alternatively, upload your search strategy to CRD in pdf format. Please note that by doing so you are consenting to the file being made publicly accessible.

Do not make this file publicly available until the review is complete

18. * Condition or domain being studied.

Give a short description of the disease, condition or healthcare domain being studied in your systematic review.

The presentation of anxiety will be explored and compared in girls and boys, as well as between secondary and primary aged pupils. The effects of school based interventions on anxiety will also be explored. anxiety can be described as an emotional process that helps individuals deal with threat or danger and is a response to abstract or inexplicit stimuli, when it is presented as low level. However, when an individual experiences high level anxiety, this can cause impairment and disturbance to their everyday life (Baldwin & Leonard, 2013; Noyes & Hoehn-Saric, 1998). The anxiety needs that will be explored in the systematic review, will be in line with those identified in the DSM-5, which identifies 11 anxiety needs.

19. * Participants/population.

Specify the participants or populations being studied in the review. The preferred format includes details of both inclusion and exclusion criteria.

Inclusion criteria:

• Children with a diagnosis of, or who are believed to have, anxiety;

• Secondary school-aged participants;

• Participants who speak English.

Exclusion criteria:

• Children/young people who have anxiety as a secondary need;

• Participants with anxiety that is associated with additional diagnosis such as ASD;

• Participants who have participated in additional interventions other than that being conducted in the research.

20. * Intervention(s), exposure(s).

Give full and clear descriptions or definitions of the interventions or the exposures to be reviewed. The

preferred format includes details of both inclusion and exclusion criteria.

School-based interventions which target the anxiety need of the pupil to be included.

Intervention-based studies must be school-based, and must be delivered by the educational institution or in cooperation with the educational institution.

Any research including interventions must have a randomised assignment of participants to remove bias, or experimental intervention studies.

21. * Comparator(s)/control.

Where relevant, give details of the alternatives against which the intervention/exposure will be compared (e.g. another intervention or a non-exposed control group). The preferred format includes details of both inclusion and exclusion criteria.

There must also be a comparison of the impact of an intervention that includes a control group as well as the target group.

22. * Types of study to be included.

Give details of the study designs (e.g. RCT) that are eligible for inclusion in the review. The preferred format includes both inclusion and exclusion criteria. If there are no restrictions on the types of study, this should be stated.

Studies must have been carried out and published between 2010 and 2021, and must be written in English

post measures to evaluate their impact.

Participants must be secondary-aged, and the interventions must be school-based.

The anxiety need must be a primary need of the pupil, and must not be as a result of an alternative diagnosis such as ASD.

Intervention-based studies must be school-based, and must be delivered by the educational institution or in cooperation with the educational institution.

Any research including interventions must have a randomised assignment of participants to remove bias, or experimental intervention studies.

Studies that are qualitative will be included.

23. Context.

Give summary details of the setting or other relevant characteristics, which help define the inclusion or exclusion criteria.

Studies will only be included where school-aged, participants are diagnosed with anxiety or are believed to

These studies must also report a pre and post measures the individuals anxiety.

Studies will only be included that involve school-based interventions.

Participants must be secondary-aged.

Children must have a diagnosis of, or be believed to have an anxiety need which is a primary need.

All studies must be school-based.

24. * Main outcome(s).

Give the pre-specified main (most important) outcomes of the review, including details of how the outcome is defined and measured and when these measurement are made, if these are part of the review inclusion criteria.

To determine how anxiety is experienced in secondary aged participants and the effectiveness of interventions on anxiety.

Measures of effect

Please specify the effect measure(s) for you main outcome(s) e.g. relative risks, odds ratios, risk difference, and/or 'number needed to treat.

The self-reported effects of anxiety on individuals, reported behaviours of anxiety from teaching staff and parents and use of self-report scales to explore anxiety.

To measure the impact of the interventions, and to assess that there has been an improvement in levels of anxiety, data from pre and post measurement tools will be assessed.

The pre and post measures will measure the level of anxiety felt or displayed before and after participation in the intervention.

Odds ratio and statistical significance for each intervention will also be analysed to assess if there is any improvement in levels of anxiety.

Where the study is looking at comparison between groups, the effect size will be analysed.

25. * Additional outcome(s).

List the pre-specified additional outcomes of the review, with a similar level of detail to that required for main outcomes. Where there are no additional outcomes please state 'None' or 'Not applicable' as appropriate to the review

None.

Measures of effect

Please specify the effect measure(s) for you additional outcome(s) e.g. relative risks, odds ratios, risk difference, and/or 'number needed to treat.

Not applicable.

26. * Data extraction (selection and coding).

Describe how studies will be selected for inclusion. State what data will be extracted or obtained. State how this will be done and recorded.

Study selection will be carried out by the researcher and will use the inclusion and exclusion criteria to select studies from those retrieved during the searches, which will then be checked="checked" value="1" by an additional individual to ensure they meet the criteria.

Any disagreements from the additional individual will be checked="checked" value="1" by the researcher and final decision will be justified. If a clear justification can not be given, the study will be omitted.

The PRISMA guidelines will be followed and reported in the review to show how papers have been selected and removed.

Any papers over which there is uncertainty regarding suitability for inclusion will be sent to fellow researchers to review and discuss.

Data extraction: study design, participant demographics, methodology and results data will be extracted. I will also extract the intervention type, length of intervention and impact.

The researcher will extract the data, which will be checked="checked" value="1" by a second individual.

Extraction criteria will be provided so it is clear what has been used and how data has been extracted.

If there are any disagreements as to what data has been extracted and its relevance, the researcher will check against the criteria. If it is felt that the data is relevant, it will be kept. If it is unclear, the data will be removed.

Any missing data will be reported in the analysis and all data will be recorded on an Excel spreadsheet.

Both study selection and data extraction will be discussed as a team.

27. * Risk of bias (quality) assessment.

State which characteristics of the studies will be assessed and/or any formal risk of bias/quality assessment tools that will be used.

Each study will be assessed for how participants were selected, and any research containing interventions

The assessment will be carried out at the study level to determine bias, or the study validity and how

this may impact the results.

Studies focusing on interventions must have a comparison or control group so the outcomes can be compared.

The Cochrane risk of bias tool will also be used to assess the level of bias in the papers selected.

28. * Strategy for data synthesis.

Describe the methods you plan to use to synthesise data. This **must not be generic text** but should be **specific to your review** and describe how the proposed approach will be applied to your data. If meta-analysis is planned, describe the models to be used, methods to explore statistical heterogeneity, and software package to be used.

A minimum of five papers will be needed for review to ensure a reliable critique can be carried out. These will be a mixture of intervention and experimental studies.

A conceptual framework, which has been created specifically for the review, will be used as a checklist to critique the presence of research questions, methodology, sample, results and discussion.

A separate document will record the details of the papers such as the sample sizes, and the specific

research questions identified in the papers.

Within the results, effect size will be analysed and reported.

Statistical measures will be reviewed to report on their appropriateness.

The results reported will focus on critiquing the quality of the studies before critiquing the papers to answer the research questions outlined in the review.

29. * Analysis of subgroups or subsets.

State any planned investigation of 'subgroups'. Be clear and specific about which type of study or participant will be included in each group or covariate investigated. State the planned analytic approach.

Studies exploring the impact of interventions of anxiety will be analysed by comparing participants with anxiety and control groups containing participants with no anxiety.

Subgroups of anxiety will also be investigated where the study specifies a difference in presentation or response to intervention.

30. * Type and method of review.

Select the type of review, review method and health area from the lists below.

Type of review

Cost effectiveness
No

Diagnostic
No

Epidemiologic
Yes

Individual patient data (IPD) meta-analysis
No

Intervention
Yes

Living systematic review
No

Meta-analysis
No

Methodology
No

Narrative synthesis
No

Network meta-analysis
No

Pre-clinical
No

Prevention

No

Prognostic
No

Prospective meta-analysis (PMA)
No

Review of reviews
No

Service delivery
No

Synthesis of qualitative studies
No

Systematic review
Yes

Other
No

Health area of the review

Alcohol/substance misuse/abuse
No

Blood and immune system
No

Cancer
No

Cardiovascular
No

Care of the elderly
No

Child health
Yes

Complementary therapies
No

COVID-19
No

Crime and justice
No

Dental
No

Digestive system
No

Ear, nose and throat
No

Education
Yes

Endocrine and metabolic disorders
No

Eye disorders
No

General interest
No

Genetics
No

Health inequalities/health equity
No

Infections and infestations
No

International development
No

Mental health and behavioural conditions
Yes

Musculoskeletal
No

Neurological
No

Nursing
No

Obstetrics and gynaecology
No

Oral health
No

Palliative care
No

Perioperative care
No

Physiotherapy
No

Pregnancy and childbirth
No

Public health (including social determinants of health)
No

Rehabilitation
No

Respiratory disorders
No

Service delivery
No

Skin disorders

No

Social care
No

Surgery
No

Tropical Medicine
No

Urological
No

Wounds, injuries and accidents
No

Violence and abuse
No

31. Language.

Select each language individually to add it to the list below, use the bin icon to remove any added in error.
English

There is not an English language summary

32. * Country.

Select the country in which the review is being carried out. For multi-national collaborations select all the countries involved.

England

33. Other registration details.

Name any other organisation where the systematic review title or protocol is registered (e.g. Campbell, or The Joanna Briggs Institute) together with any unique identification number assigned by them. If extracted data will be stored and made available through a repository such as the Systematic Review Data Repository (SRDR), details and a link should be included here. If none, leave blank.

34. Reference and/or URL for published protocol.

If the protocol for this review is published provide details (authors, title and journal details, preferably in Vancouver format)

Add web link to the published protocol.

Or, upload your published protocol here in pdf format. Note that the upload will be publicly accessible.

No I do not make this file publicly available until the review is complete

Please note that the information required in the PROSPERO registration form must be completed in full even if access to a protocol is given.

35. Dissemination plans.

Do you intend to publish the review on completion?

Yes

Give brief details of plans for communicating review findings.?

The findings will be disseminated to Educational Psychologists (EP) so they are able to review any differences in presentation between genders and apply this to their practice when exploring a child's needs.

It will also make EPs aware of the impact of different interventions when making recommendations.

36. Keywords.

Give words or phrases that best describe the review. Separate keywords with a semicolon or new line. Keywords help PROSPERO users find your review (keywords do not appear in the public record but are included in searches). Be as specific and precise as possible. Avoid acronyms and abbreviations unless these are in wide use.

Anxiety; Education; Intervention; Secondary;

37. Details of any existing review of the same topic by the same authors.

If you are registering an update of an existing review give details of the earlier versions and include a full bibliographic reference, if available.

38. * Current review status.

Update review status when the review is completed and when it is published.New registrations must be ongoing so this field is not editable for initial submission.
Please provide anticipated publication date

Review_Ongoing

39. Any additional information.

Provide any other information relevant to the registration of this review.

40. Details of final report/publication(s) or preprints if available.

Leave empty until publication details are available OR you have a link to a preprint (NOTE: this field is not editable for initial submission). List authors, title and journal details preferably in Vancouver format.

Give the link to the published review or preprint.

Appendix III: Critiquing framework

Introduction	**0=No**	**1=Partially Covered**	**2=Yes**	**N/A**	**Notes**
• Is there a clearly stated research question? ***CASP RCT Checklist***					
• Are terms/theories clearly defined? ***Adapted from Coughlan et al.***					
• Has the hypothesis been clearly identified? ***SURE Checklist***					
• Is there a rationale for the hypothesis, drawing on previous literature? ***Researcher's addition***					
• Was anxiety clearly operationalised? ***Researcher's addition***					
Methodology					
• Was the target population clearly identified using inclusion/exclusion criteria? ***Adapted from Coughlan et al.***					
• Were the participants and settings sufficiently identified? ***Researcher's addition***					
• Is anxiety identified as a primary need in participants? ***Reseacher's addition***					
• Was this the first intervention for anxiety participants have taken part in? ***Researcher's addition***					
• Was there a control group used? ***JBI Quasi-experimental Appraisal Tool***					
• Was the assignment of participants to interventions randomised? (intervention studies) ***CASP RCT Checklist***					
○ Was the method appropriate? ***CASP RCT Checklist***					
○ Was randomisation sufficient to eliminate systematic bias? ***CASP RCT Checklist***					
○ Was the allocation sequence concealed from investigators and participants? ***CASP RCT Checklist***					

• Is the research design identified? ***Coughlan et al.***					
• Were tools used to measure pre and post effects of interventions? ***Researcher's addition***					
• Were tools used to measure participant anxiety? ***Researcher's addition***					
• Has the data gathering instrument been clearly described? How was it developed? ***Coughlan et al.***					
• Could the study be replicated? ***Researcher's addition***					
• Were ethical considerations clearly covered? ***Adapted from Coughlan et al.***					
• Were interventions well described and appropriate? ***SURE checklist***					
○ Were groups treated equally? ***SURE checklist***					
○ Was exposure to the intervention and control group adequate? ***SURE checklist***					
Results/ Data Analysis					
• Were all participants who entered the study accounted for? ***CASP RCT Checklist***					
○ Were losses to follow-up and exclusions after randomisation accounted for? ***CASP RCT Checklist***					
• Were participants analysed in the study groups to which they were randomised (intention-to-treat analysis)? Was it appropriate? ***JBI RCT Checklist***					
• Was data analysed based on each research question? ***Adapted from SURE checklist***					
• Are appropriate statistics reported (effect sizes, confidence intervals/standard deviations)? ***SURE checklist***					

Appendix IV: Narrative record of findings

Paper number	Title	Author(s)	Publication Date	Research Q's	Definition of anxiety used	Research design	Participants (total recruited, groups, demographic)	Setting for study (location, primary/secondary school)	Measures	Intervention type (if applicable)	Results	Strengths	Limitations	Other thoughts

Appendix V: Summary of Risk of Bias assessments

Unique ID	38	**Study ID**		**Assessor**	Taj Braich
Ref or Label		**Aim**	assignment to intervention (the 'intention-to-treat' effect)		
Experimental		**Comparator**		**Source**	Journal article(s)
Outcome		**Results**		**Weight**	1

Domain	Signalling question	Response	Comments
Bias arising from the randomization process	1.1 Was the allocation sequence random?	Y	
	1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Y	
	1.3 Did baseline differences between intervention groups suggest a problem with the randomization process?	N	Power analysis showed that for a medium effect, with a power of 0.80, within three groups, with an alpha of 0.05 (one-sided),
	Risk of bias judgement	**Low**	
Bias due to deviations from intended interventions	2.1.Were participants aware of their assigned intervention during the trial?	PN	Aware only after the pre-test
	2.2.Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	Y	

	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	NI	
	2.4 If Y/PY to 2.3: Were these deviations likely to have affected the outcome?	NA	
	2.5. If Y/PY/NI to 2.4: Were these deviations from intended intervention balanced between groups?	NA	
	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Y	
	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	NA	
	Risk of bias judgement	**Low**	
Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomized?	Y	
	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	NA	
	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	NA	
	3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	NA	
	Risk of bias judgement	**Low**	
Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	N	
	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups?	N	
	4.3 Were outcome assessors aware of the intervention received by study participants?	Y	

	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	PY	Interviews used at pre-test and after 1 year but the rest were questionnaires or assessment tools.
	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	PY	
	Risk of bias judgement	**High**	Interviews used at pre-test and after 1 year but the rest were questionnaires or assessment tools.
Bias in selection of the reported result	5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis?	Y	
	5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	N	
	5.3 ... multiple eligible analyses of the data?	N	
	Risk of bias judgement	**Low**	
Overall bias	**Risk of bias judgement**	**Some concerns**	

Unique ID	612	**Study ID**		**Assessor**	Taj Braich
Ref or Label		**Aim**	assignment to intervention (the 'intention-to-treat' effect)		
Experimental		**Comparator**		**Source**	Journal article(s)
Outcome		**Results**		**Weight**	1

Domain	Signalling question	Response	Comments
Bias arising from the randomization process	1.1 Was the allocation sequence random?	Y	
	1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Y	
	1.3 Did baseline differences between intervention groups suggest a problem with the randomization process?	N	
	Risk of bias judgement	**Low**	
Bias due to deviations from intended interventions	2.1.Were participants aware of their assigned intervention during the trial?	Y	Participants were invited to a meeting where they were told the nature of the study. Only the first researcher was blind from the assigned intervention
	2.2.Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	PY	

			as they were analysing the data.
	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	N	
	2.4 If Y/PY to 2.3: Were these deviations likely to have affected the outcome?	NA	
	2.5. If Y/PY/NI to 2.4: Were these deviations from intended intervention balanced between groups?	NA	
	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Y	
	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	NA	
	Risk of bias judgement	**Low**	
Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomized?	Y	
	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	NA	
	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	NA	
	3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	NA	
	Risk of bias judgement	**Low**	
	4.1 Was the method of measuring the outcome inappropriate?	N	

Bias in measurement of the outcome	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups?	N	
	4.3 Were outcome assessors aware of the intervention received by study participants?	N	
	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	NA	
	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	NA	
	Risk of bias judgement	**Low**	
Bias in selection of the reported result	5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis?	PY	
	5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	N	
	5.3 ... multiple eligible analyses of the data?	N	
	Risk of bias judgement	**Low**	
Overall bias	**Risk of bias judgement**	**Low**	

Unique ID	1152	**Study ID**		**Assessor**	Taj Braich
Ref or Label		**Aim**	assignment to intervention (the 'intention-to-treat' effect)		
Experimental		**Comparator**		**Source**	Journal article(s)
Outcome		**Results**		**Weight**	1

Domain	Signalling question	Response	Comments
Bias arising from the randomization process	1.1 Was the allocation sequence random?	Y	
	1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Y	
	1.3 Did baseline differences between intervention groups suggest a problem with the randomization process?	N	
	Risk of bias judgement	**Low**	
Bias due to deviations from intended interventions	2.1.Were participants aware of their assigned intervention during the trial?	Y	It was either the intervention or wait list
	2.2.Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	Y	
	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	N	
	2.4 If Y/PY to 2.3: Were these deviations likely to have affected the outcome?	NA	

	2.5. If Y/PY/NI to 2.4: Were these deviations from intended intervention balanced between groups?	NA	
	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Y	
	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	NA	
	Risk of bias judgement	**Low**	
Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomized?	Y	
	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	NA	
	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	NA	
	3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	NA	
	Risk of bias judgement	**Low**	
Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	N	
	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups?	N	
	4.3 Were outcome assessors aware of the intervention received by study participants?	N	
	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	NA	
	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	NA	

	Risk of bias judgement	**Low**	
Bias in selection of the reported result	5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis?	Y	
	5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	N	
	5.3 ... multiple eligible analyses of the data?	N	
	Risk of bias judgement	**Low**	
Overall bias	**Risk of bias judgement**	**Low**	

Unique ID	1143	**Study ID**		**Assessor**	Taj Braich
Ref or Label		**Aim**	assignment to intervention (the 'intention-to-treat' effect)		
Experimental		**Comparator**		**Source**	Journal article(s)
Outcome		**Results**		**Weight**	1

Domain	Signalling question	Response	Comments
Bias arising from the randomization process	1.1 Was the allocation sequence random?	Y	
	1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	NI	
	1.3 Did baseline differences between intervention groups suggest a problem with the randomization process?	NI	
	Risk of bias judgement	**Some concerns**	
Bias due to deviations from intended interventions	2.1.Were participants aware of their assigned intervention during the trial?	NI	No information provided about carers. Psychologist delivering the experiment was aware
	2.2.Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	PY	
	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	N	
	2.4 If Y/PY to 2.3: Were these deviations likely to have affected the outcome?	NA	

	2.5. If Y/PY/NI to 2.4: Were these deviations from intended intervention balanced between groups?	NA	
	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Y	
	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	NA	
	Risk of bias judgement	**Low**	
Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomized?	Y	
	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	NA	
	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	NA	
	3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	NA	
	Risk of bias judgement	**Low**	
Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	N	
	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups?	N	
	4.3 Were outcome assessors aware of the intervention received by study participants?	N	
	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	NA	
	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	NA	

	Risk of bias judgement	**Low**	
Bias in selection of the reported result	5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis?	Y	
	5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	N	
	5.3 ... multiple eligible analyses of the data?	N	
	Risk of bias judgement	**Low**	
Overall bias	**Risk of bias judgement**	**Low**	

Appendix VI: Summary of findings and interpretations

Table 11

Findings and interpretations of studies comparing anxiety differences between gender and age and an exploration of contributing factors.

Study (Author(s), Year, Country)	**Anxiety examined**	**Findings and Interpretations**
Bakhla et al. (2013), India	Anxiety disorders	Female students scored higher in total and in all sub-type measures of anxiety than males. Authoritative parenting style caused a higher level of anxiety in pupils compared to more dismissive styles.
Delgado et al (2018), Spain	Social anxiety	Students with high levels of social anxiety were: 1) Less likely to present with adequate attitudes towards schools and learning (48%) 2) More likely to present with lower probability of motivation (32%) and managing their study time (33%); 3) More likely to have higher level of anxiety and worry about school (71%); 4) Less likely to concentrate (61%)
Grills-Taquechel et al (2010), USA	Social and Separation anxiety	Females reported higher levels of separation anxiety than males, in both grades. Significant decrease in social anxiety for males with age, but not for females. Anxiety was higher when transitioning at a younger age. No impact of global self-worth, social acceptance, support scales, and gender on predicting anxiety in later age.

Mann and Walshaw (2019), New Zealand	Maths Anxiety	111 participants reported no anxiety, 123 reported some anxiety, 88 reported 'bad anxiety', 50 reported 'very bad anxiety' and 43 reported 'worse anxiety'. Higher maths anxiety was reported in relation to testing rather than learning, which was likely to be due to no previous exposure to tests. 16.6% of participants reported high levels of anxiety; 59.4% female and 40.6% male. Statistically significant difference between males and females reported anxiety. Gender difference for TMA increased with school decile. Females from single-sex schools reported higher levels of anxiety compared to males from single-sex schools. Differences between single-sex and co-ed schools for females was significant for MTA and TMA and significant for males for just MTA.
Putwain and Daly (2014), UK	Test anxiety	Females reported significantly higher scores of worry, tension, and social derogation. Largest gender difference was tension, followed by worry and social derogation.
Sagir (2012), Turkey	Science Anxiety	Students who received support for science, had a lower level of anxiety and/or positive attitudes and perceptions, than those who did not. There were no significant differences in anxiety between genders. Students in schools with higher science success, had higher levels of anxiety than those in schools with lower success levels. Anxiety in students decreased with age.

Table 12

Findings and interpretations of studies exploring the impact of interventions on anxiety.

Study (Author(s), Year, Country)	**Anxiety examined**	**Intervention type**	**Findings and Interpretations**
Amin, Iqbal and Irfan (2020), Pakistan	Social Anxiety	CBT	A significant reduction in anxiety, fear of negative evaluation and improvement in self- esteem in the intervention group than those in the control group.
de Hullu et al (2017), Netherlands	Social Anxiety Disorder and Test Anxiety	CBT and CBM	After two years, a significant overall decrease in social anxiety and test anxiety was recorded, however there was no significant intervention effect on either group.
Putwain and Pescod (2018), UK	Test Anxiety	CBT (STEPs)	No significant effect of the intervention was recorded on worry, tension or uncertain control. The intervention showed a decline in bodily symptoms and test-irrelevant thoughts.
Putwain and von der Embse (2021), UK	Test Anxiety	CBT (STEPs)	Participants in the intervention group showed a significantly larger decrease in anxiety than the control group, however there was no main effect of the intervention in reducing anxiety.