



Anxiety disorders in children and young people: assessment and treatment

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Practitioner review**Anxiety disorders in children and young people: assessment and treatment**

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Abstract

Despite significant advancements in our knowledge of anxiety disorders in children and adolescents, they continue to be under-recognised and under-treated. It is critical that these disorders are taken seriously in children and young people as they are highly prevalent, have a negative impact on educational, social and health functioning, create a risk of ongoing anxiety and other mental health disorders across the lifespan and are associated with substantial economic burden. Yet very few children with anxiety disorders access evidence-based treatments and there is an urgent need for widespread implementation of effective interventions. This review aims to provide an overview of recent research developments that will be relevant to clinicians and policymakers, particularly focusing on the development and maintenance of child anxiety disorders and considerations for assessment and treatment. Given the critical need to increase access to effective support we hope this review will contribute to driving forward a step change in treatment delivery for children and young people with anxiety disorders and their families.

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Introduction

Anxiety disorders are the most prevalent mental health disorders in children and young people (see Table 1 for DSM classification and prevalence estimates). In their worldwide review of the prevalence of mental disorders in children and young people, Polanczyk, Salum, Sugaya, Caye, and Rohde (2015) reported a mean prevalence of 6.5% based on studies conducted between 1985 and 2012, however this is highly likely to be an underestimate of the current situation given recent findings from consecutive national surveys in England in which there was a 51% increase in the reported prevalence of anxiety disorders between 2004 and 2017 (NHS Digital, 2018). Given the significant negative impact of childhood anxiety disorders on educational, social and health functioning, the risk of ongoing anxiety and other mental health disorders in adulthood (Copeland, Angold, Shanahan, & Costello, 2014) and the substantial economic burden (Fineberg et al., 2013), this recent increase in reported prevalence is extremely concerning and reflects an urgent need for effective, early intervention.

Aims of this review

The last three decades have seen a burgeoning of research in to the treatment of anxiety disorders in children and adolescents, with a number of meta-analyses published over the last decade. Here we have focused on recent developments in the field that will be of most relevant to clinical practitioners, specifically, recent literature on the development and maintenance of anxiety disorders, assessment and intervention. In line with the bulk of the literature in this field we have focused primarily on school-aged children and young people (4-18 years).

Development of anxiety disorders in children and young people

The two most robust predictors of the development of anxiety disorders in children are inhibited temperament (the tendency to withdraw, avoid or respond fearfully to new situations), which increases the risk of later anxiety disorders more than seven-fold (Clauss & Blackford, 2012) and having a parent with an anxiety disorder, which raises the risk almost two-fold (Lawrence, Murayama, & Creswell, 2019). These findings are in keeping with evidence from twin, family and adoption studies that suggest heritability rates of between 25-50% for child anxiety symptoms (Cheesman, Rayner, & Eley, 2019), but also highlight the substantial role of the environment. Because of the inter-familial risks of anxiety disorders, research on environmental risk factors has predominantly focused on parenting behaviours, where there is some longitudinal and experimental research evidence for a causal role of parental overinvolvement/ control (de Wilde & Rapee, 2008; Hudson & Dodd, 2012; Rubin, Burgess, & Hastings, 2002; Thirlwall & Creswell, 2010). However, a growing body of work highlights the reciprocal relationship between child inhibition/anxiety and parental involvement/control, in which parental involvement/control is both elicited by child inhibition/anxiety and influences its development (Eley, Napolitano, Lau, & Gregory, 2010; J. L. Hudson, Doyle, & Gar, 2009). Experimental and longitudinal evidence also supports a causal role of parental modelling and transference of fear information (e.g., Field & Lawson, 2003), although to date these studies have focused on the development of fear or avoidance, rather than anxiety disorders per se. Despite quite extensive research attention, evidence for a role of parental negativity in the development of child anxiety disorders is generally lacking (Lawrence, Waite, & Creswell, 2019).

Notably, where particular parental behaviours appear to have an effect on child anxiety disorders, this is likely to vary according to child characteristics, including the child or young

person's age or stage of development (e.g., Waite & Creswell, 2015), and the young person's temperament. For example, children with higher levels of behavioural inhibition or trait anxiety have been found to respond to maternal expressed anxiety or control with a more fearful response, compared to those with lower levels (De Rosnay, Cooper, Tsigaras, & Murray, 2006; Thirlwall & Creswell, 2010). Furthermore, in a recent longitudinal study behaviourally inhibited pre-schoolers only had higher anxiety symptoms at 12 years of age when there had been high maternal overinvolvement at age 4 years, and effects were mitigated when mothers demonstrated low overinvolvement (Hudson, Murayama, Meteyard, Morris, & Dodd, 2019)

In terms of broader environmental factors, the role of life events and peer relationships have also been examined, though to a lesser extent, bringing further evidence of reciprocal relationships between 'risk' factors and childhood anxiety disorders (Broeren, Newall, Dodd, Locker, & Hudson, 2014; Kim, Conger, Elder Jr, & Lorenz, 2003). Here too, it is likely that these relationships are influenced by age, temperament and other moderating factors (Broeren et al., 2014; Turner, Beidel, & Wolff, 1996). Research in other areas of the environment, such as economic adversity, sibling relationships, social media and school environment has received limited attention to date but it is likely that in some instances they may create risks for the development and maintenance of anxiety (Keles, McCrae, & Grealish, 2019), as well as potential opportunities for support and intervention (Keeton, Teetsel, Dull, & Ginsburg, 2015).

Maintenance of anxiety disorders in children and young people

In contrast to models of anxiety disorders in adults which have tended to focus on maintenance factors (i.e. factors that prevent new learning in feared situations; e.g., Clark, 1986; Clark & Wells, 1995; Rapee & Heimberg, 1997), models of anxiety disorders in children and adolescents (e.g., Spence & Rapee, 2016) have tended to focus more on developmental risk

factors - meaning we have quite limited understanding on which to base the content of treatments (Halldorsson & Creswell, 2017). However there is emerging evidence that similar cognitive processes may occur in children and young people to those described in adult cognitive models, for example, associations between self-focused attention and social anxiety (Hodson, McManus, Clark, & Doll, 2008) and intolerance of uncertainty and worry (Fialko, Bolton, & Perrin, 2012) in young people. To date these studies have largely been carried out using cross-sectional designs in non-clinical populations in varying, and often wide, age groups. Going forward, experimental studies to test causal and maintaining processes in children and young people are needed, that can take account of children and young people's cognitive maturity and social context, in order to develop specific developmentally tailored interventions (e.g., Leigh & Clark, 2018).

Assessment

There is a high degree of comorbidity among anxiety disorders in children and young people, particularly with other anxiety disorders across the age range (Leyfer, Gallo, Cooper-Vince, & Pincus, 2013), and mood disorders in adolescence (Essau, 2003). However, separate anxiety disorders can be adequately and reliably diagnosed (Spence, 2017). To assess DSM-5 anxiety disorders, a multi-method and multi-informant approach is recommended (Hudson, Newall, Schneider, & Morris, 2014; Kazdin, 2003; Silverman & Ollendick, 2005) using i) interview schedules, ii) questionnaire measures and where applicable, iii) observational approaches.

Interview Schedules: Of these three methods, structured diagnostic interviews such as the Anxiety Disorders Interview Schedule for children and parents (Silverman & Albano, 1996) are considered to be the “gold standard”. While they are commonly used in research trials, standardised assessments such as the ADIS-C/P, are rarely used systematically in clinical

settings, bringing risks that specific anxiety disorders may be missed or misdiagnosed, and that children and young people may not respond to the non-specific interventions that they often receive (Craddock et al., 2008). These risks have led to recommendations that standardised assessments should be used as an adjunct to clinical assessment (Martin, Fishman, Baxter, & Ford, 2010).

Structured diagnostic interviews provide a comprehensive assessment of anxiety (including symptoms, severity and interference) using independent information from both the parent or carer and the child or adolescent. Given the high degree of comorbidity among disorders, a comprehensive assessment considers all anxiety and related disorders (e.g., mood and behaviour disorders) in order to obtain accurate differential diagnoses at the start of treatment, and also to determine the success of the treatment approach in reducing the presence and severity of, not only the most interfering (i.e., primary) diagnosis, but all anxiety diagnoses. As anxiety disorders are associated with increased risk of suicidal ideation (O'Neil Rodriguez & Kendall, 2014) and other factors that increase the risk of suicidal ideation and behaviour (e.g. being bullied by peers, alcohol and drug problems, and poor academic and vocational achievement; (Reijntjes, Kamphuis, Prinzie, & Telch, 2010; Robinson, Sareen, Cox, & Bolton, 2011), a comprehensive interview assessment should also include an appropriate assessment of risk of suicide and self-injury.

One of the significant methodological issues that arises when using an interview schedule is that clinicians need to manage differing perspectives provided by parents and children regarding anxiety symptom presence, severity and impairment (Choudhury, Pimentel & Kendall, 2003; Grills & Ollendick, 2003) in order to make appropriate clinical decisions. Although clinicians are more likely to be influenced by the parent than the child's perspective

(Grills & Ollendick, 2003), particularly among pre-adolescents, it is often difficult to determine which report is more valid. To ensure equivalent value is placed on both the child or adolescent's report and that of the parent, clinicians are encouraged to use the 'OR rule' (Comer & Kendall, 2004) in which the diagnostic profile includes clinically interfering symptoms when they are reported by *either* the young person *or* the parent, unless doing so would lead to double counting of the same symptoms.

Questionnaire measures: Diagnostic interviews are typically supplemented with psychometrically reliable and valid questionnaire measures from multiple sources (e.g., parent, young person, teacher) to assess anxiety symptoms and/or impairment. Although questionnaire measures should be used in conjunction with interviews, they bring advantages of ease of administration and resulting reductions in time and cost. Further, combining questionnaire data from parents and the young person leads to a richer and sometimes more accurate perspective of the child's symptoms (Reardon, Creswell, et al., 2019). Most youth-report questionnaires are designed for children 7 years and up, however children's reading and cognitive ability at this age varies dramatically and research has highlighted that a portion of children do not understand the questionnaires presented to them (White & Hudson, 2016). It is, therefore, important to consider whether the measure is appropriate for the child's developmental stage when deciding which reporters to include and which questionnaire measures to choose. Teacher report can also help add to clinician's understanding of the child's presenting problems, particularly for school-specific or classroom-specific symptoms, however this may not always be practical to obtain (e.g. as children move classes/schools) and there is limited evidence of reliability and validity (although see Lyneham, Street, Abbott & Rapee, 2008; Reardon et al., 2018 for initial promising findings).

A host of measures have been developed to assess multi-dimensional anxiety symptoms in children and adolescents that are available in both parent and youth report, such as the Spence Children's Anxiety Scale (SCAS; (Nauta et al., 2004; Susan H. Spence, Barrett, & Turner, 2003), Screen for Child Anxiety and Related Emotional Disorders (SCARED); (Birmaher, Khetarpal, Cully, Brent, & McKenzie, 2003), and the Multidimensional Anxiety Scale for Children (MASC; March, Parker, Sullivan, Stallings, & et al., 1997). These measures have typically been informed by earlier editions of the Diagnostic and Statistical Manual of Mental Disorders (e.g. DSM-IV; American Psychiatric Association, 1994), with the exception of the Youth Anxiety Measure – 5 (Muris et al., 2017)) which adds selective mutism items bringing it in line with DSM-5 (American Psychiatric Association, 2013) and ICD-11 (Reed et al., 2019). To detect elevated symptoms, the measure needs to have available established normative data - ideally culturally relevant - to indicate the degree to which the symptoms compare to other children of the same age and gender and the extent to which they can accurately identify children and adolescents with/out anxiety disorders. Multidimensional measures provide an overall score for anxiety as well as a subscale score for symptoms of specific anxiety disorders. Recent data from a large collaborative study of 10 international child anxiety clinics suggest that the SCAS can be useful in differentiating some (e.g. social anxiety disorder and separation anxiety disorder) but not all of the anxiety disorders (e.g. generalized anxiety disorders and specific phobias) in children (Reardon, Creswell, et al., 2019).

Depending on the child's specific presentation and the focus of treatment, clinicians may also choose to include additional disorder-specific measures. For example, if social anxiety disorder is the focus of treatment, there are a number of measures specifically designed to assess social anxiety symptoms (e.g., Social Phobia and Anxiety Inventory – Children; Beidel, 1996). Given the common co-occurrence of depression, particularly in adolescence, and its likely impact on

treatment outcomes (Hudson et al., 2015), it is also important to include measures of depressive symptoms such as the Short Mood and Feelings Questionnaire (SMFQ; Angold, 1985) or using a combined measure such as the Revised Child Anxiety and Depression Scale (RCADS; Chorpita et al, 2000).

The assessment of anxiety symptoms in children with Autism Spectrum Disorders (ASD) has received increasing attention over the last few years with evidence questioning the appropriateness of existing anxiety measures (Glod et al., 2017). Specifically parents of ASD children respond differently to particular items of the SCAS-P compared to parents of typically developing children (Toscano et al., under review) and the factor structure differs (e.g. Jitlina et al., 2017; Magiati et al., 2017). These results highlight that questionnaire measures designed and evaluated with typically developing children should be used with caution in children with ASD and, although there may some utility in determining a total anxiety score, clinicians should not rely on the subscales from multi-dimensional measures such as the SCAS-P, particularly those that measure physical injury fears and obsessive-compulsive disorder symptoms, when working with children with ASD (Magiati et al., 2017; Toscano et al., under review).

In addition to symptom severity, a number of questionnaires have been developed to assess general functioning and impairment, such as the Barkley Functional Impairment Scale for Children and Adolescents (Barkley, 2012), or the Child and Adolescent Social and Adaptive Functioning Scale (Price, Spence, Sheffield, & Donovan, 2002). We have found the Child Anxiety Life Interference Scale (Lyneham et al., 2013) and the Child Anxiety Impact Scale (Langley, Bergman, McCracken, & Piacentini, 2004) particularly useful as they were

developed to assess the specific impact of anxiety symptoms on the child's life at home, outside the home as well as the impact on the parent's life. Recent evidence indicates that parent reported life interference is a good indicator of child anxiety diagnostic status (Evans, Thirlwall, Cooper, & Creswell, 2017).

Observational Assessment: Observational assessments are infrequently used outside of research settings but can be used to determine the level of fear or anxiety experienced when the child is exposed to threatening stimuli. For example, behavioural approach tasks (BAT) involve the child taking steps of increasing difficulty towards a feared object or situation in a controlled environment. BATs can provide critical information about fear levels (Ollendick, Lewis, Cowart, & Davis, 2012) and can be particularly informative in situations where there has been inconsistent or unreliable reporting on diagnostic and questionnaire measures.

Treatment: psychological interventions

The most frequently evaluated psychological treatment for anxiety disorders in children and young people is Cognitive Behaviour Therapy (CBT), which typically involves the application of exposure to enable children and young people to confront feared situations, typically in a graded fashion, in order to develop new learning about what really happens when they enter anxiety-provoking situations. In CBT programmes, exposure is typically accompanied by cognitive restructuring procedures, to help children identify and challenge negative automatic thoughts. Some programmes also include other forms of skills training, such as relaxation, social skills and problem solving training. It has consistently been concluded, across a number of meta-analyses, that CBT show clear benefits over wait-list controls, with, for example, an overall response rate of 59.4% for CBT versus 17.5% for controls (e.g. James et al., 2013). While there are some positive indications of sustained benefits of CBT over the long-term (e.g.

Gibby, Casline, & Ginsburg, 2017), others have found high relapse rates (Ginsburg et al., 2016). Overall, very few studies have been able to maintain a control condition over the long-term (e.g. James et al, 2013) limiting conclusions that can be made.

Does the format of delivery matter? A recent systematic review of psychotherapies for childhood anxiety disorders (Zhou et al., 2018) identified 101 randomised controlled trials (RCTs) including 11 categories of psychotherapy, which all involved CBT (or Behavioural Therapy) but in a range of formats (individual, group, bibliotherapy, internet assisted- with/out parent involvement or child/parent only). On the basis of a network meta-analysis (which compares more than two interventions to each other in a single meta-analysis) there was some evidence that groups may be a particularly effective format. However, these findings need to be interpreted with caution, given that group treatments have not been found to be more effective than individual treatments when compared directly (e.g. Manassis et al., 2002) and trials which have taken a group approach may disproportionately reflect other important study characteristics, including particular aged participants and intervention settings (e.g. clinic versus community). Going forward we need sufficiently powered RCTs that allow us to make head-to-head comparisons between different treatment formats. The inclusion of health economic analyses to address these questions will be critical, as it is far from clear that group-based treatments are necessarily more cost-effective than individual approaches, as illustrated in the case of social anxiety disorder in adults (NICE, 2013). On the other hand, other treatment formats have promising evidence and may bring particular economic advantages (e.g., bibliotherapy (Yuan et al., 2018), computerised and internet based interventions (e.g. Ebert et al., 2015; and see below section: ‘Improving access to psychological treatments’). Youth and parent preferences should also be considered, for example, there is promising evidence for treatment of specific phobias delivered predominantly within a single (extended) treatment

session (e.g. Ollendick et al., 2009) and this intensive approach has been found to be highly motivating and acceptable in adult settings (e.g. Bevan et al., 2010).

What are the important treatment components? There has been very little examination of how what is actually done within the CBT programme relates to treatment outcome. This is a serious shortcoming, given recent evidence that certain procedures can either enhance or inhibit new, adaptive learning (e.g., Craske, Treanor, Conway, Zbozinek, & Vervliet, 2014). However, the few notable exceptions include an examination of the trajectory of symptom change in the large U.S. CAM trial (n= 488; 7-17 years) in which the introduction of both cognitive restructuring (which involved changing self-talk) and exposure tasks significantly accelerated the rate of progress on measures of symptom severity and global functioning moving forward in treatment; whereas the introduction of relaxation training had limited impact (Peris et al., 2015a). Notably, improvements in coping efficacy were a significant mediator of treatment gains, but improvements in anxious self-talk were not (Kendall et al., 2016). These findings suggest that treatments might be more efficiently delivered by promoting new learning (particularly about coping) through exposure. This conclusion was also supported by a recent meta-analysis that concluded that introducing anxiety management strategies before exposure does not increase the efficacy of treatment (Ale, McCarthy, Rothschild, & Whiteside, 2015). Recent dismantling studies also provide consistent preliminary findings; for example exposure therapy (in which parents are trained how to facilitate exposure outside sessions) achieved greater improvements than an intervention that only involved the anxiety management strategies that are typically administered pre-exposure, such as identifying feelings and anxious cognitions, relaxation and problem-solving (Whiteside et al., 2015). Notably, different treatment formats may promote different pathways to recovery as indicated by Silverman et al.'s recent (2019) findings that reductions in parental psychological control

mediated outcomes from ‘parent involvement CBT’ whereas positive peer-youth relationships mediated outcomes from group CBT with peers. Together these findings indicate that the opportunity to learn through exposure is key, and that this may be optimised in a number of different ways.

What should we deliver to whom? The majority of trials of CBT for child anxiety disorders have evaluated outcomes for mixed anxiety disorders (74% in Zhou et al., 2018), typically including children presenting with social anxiety disorder, generalized anxiety disorder, separation anxiety disorder, obsessive compulsive disorder and specific phobias. However, a number of recent studies have identified that children with social anxiety disorder benefit less from generic CBT approaches than children with non-social forms of anxiety disorders (e.g., post treatment remission rates of 40.6% vs. 72.0%, Ginsburg et al., 2011; 22.3% vs. 42.1-52.7%, Hudson et al., 2015). The reasons for this remain unclear, with hypotheses including a lack of focus on relevant exposures (e.g. Ginsburg et al., 2011), potential disorder-specific maintenance factors that may not be addressed in current treatments (e.g., Halldorsson & Creswell, 2017) and/or social skills deficits (e.g., Beidel, Turner, & Morris, 2000). To date, RCTs of social anxiety disorder specific treatments have predominantly focused on addressing potential social skills deficits with consistent findings that they are effective in comparison to waitlist control conditions or active, non-specific control interventions (e.g., Beidel et al., 2000; Donovan & March, 2014; Öst, Cederlund, & Reuterskiöld, 2015; Spence, Donovan, & Brechman-Toussaint, 2000) and in meta-analyses these treatments have fared better than generic forms of CBT (e.g. Reynolds et al., 2012). However, in a head-to-head comparison of social anxiety disorder specific treatment (including social skills training and a focus on factors identified in cognitive models of social anxiety disorder) and traditional generic CBT (both delivered online to 125 8-17 year olds), Spence et al. (2017) found no significant difference in

outcomes between these two active treatments. In contrast, promising findings have come out of recent studies that have put a particular focus on putative cognitive maintenance mechanisms of social anxiety disorder, at least among adolescents (Ingul, Aune, & Nordahl, 2014; Leigh & Clark, 2015).

In addition to social anxiety disorder, other predictors that have been identified (albeit inconsistently), include depression, externalising disorders and parental psychopathology (Hudson et al., 2015). These factors appear to work in a cumulative linear way: the more pre-treatment risk factors, the poorer the child's outcomes following treatment (Hudson et al., 2013). This suggests we need to improve treatment for those children we can identify, at pre-treatment, who possess these risk factors. When it comes to comorbid conditions, there is some evidence, albeit preliminary, to suggest that modular treatments (i.e., treatments in which procedures from evidence-based treatments for commonly comorbid disorders are structured as free-standing modules, which can be used as appropriate depending on particular client characteristics e.g., Weisz, et al., 2012) may lead to enhanced outcomes. For example, in a study by Weisz et al. (2012) modular treatment showed enhanced outcomes on parent reported internalising symptoms (but not on disorder remission) compared to standard CBT. When it comes to parental anxiety, it remains unclear exactly how best to improve child outcomes (e.g. (J. L. Hudson et al., 2014), although recent studies indicate that good outcomes can be achieved when parents are supported as part of, or alongside, their child's treatment (Creswell et al., 2019; Hiller et al., 2016).

Does parental involvement improve treatment? A final way in which CBT protocols have differed across trials, is in how parents have been involved in treatment. Parental involvement ranges from briefly joining sessions to provide and hear updates, to being the primary recipient

of the intervention. Where meta-analyses have considered the moderating role of parental involvement on treatment outcome they have typically failed to find a significant benefit from including parents (Hiller et al., 2016; Thulin, Svirsky, Serlachius, Andersson, & Ost, 2014) Zhou et al., 2018). These findings are typically limited, however, by binary categorisations of whether or not parents are (substantially) involved in treatment rather than *how* parents are involved. It is understandable that parental involvement will not enhance treatment outcomes if parents are not being included in ways that, for example, are likely to enhance learning through exposure, and, equally, that parental involvement may have detrimental effects on outcomes if it is done in such a way that weakens the dose of critical ingredients of treatment (e.g., Taboas, McKay, Whiteside, & Storch, 2015). This emphasises the need for a more nuanced approach to parental involvement in CBT for child anxiety disorders going forwards and a recognition that this may differ in particular circumstances, on the basis of child, parent and broader environmental factors.

Are treatments applicable across populations/settings? To date RCTs of CBT have predominantly be conducted in Western countries, with Caucasian, relatively affluent populations. It is clear that far more extensive investigation is needed to evaluate psychological treatments for child anxiety disorders among more diverse populations and settings, particularly given the promising findings that suggest that children from ethnic minorities (specifically Hispanic/Latino youth in the USA) can obtain similar outcomes to those from the dominant ethnic group (here European-Americans), despite lower family incomes (Pina, Silverman, Fuentes, Kurtines, & Weems, 2003). A recent relevant example used bidirectional cultural adaptation to develop the Japanese Anxiety Children/Adolescents CBT (JACA-CBT) programme (Ishikawa et al., 2019), providing initial support for the transportability of CBT to a non-Western culture.

What is the effectiveness of non-CBT psychological therapies? Unfortunately, at this stage very little can be concluded about psychological therapies other than cognitive and behavioural therapies, as few RCTs have directly addressed the effectiveness of other psychotherapeutic approaches. Recent exceptions include an RCT by Silk et al. (2018), which compared individual CBT to supportive child centred therapy (CCT). While the majority of 9-14 year old children responded well to both conditions (responders: 71% CBT, 56% CCT), CBT was associated with higher rates of full recovery post-treatment (67% vs 47%) and one year later (82% vs 65%). Another recent study compared CBT to Acceptance and Commitment Therapy (ACT) (Hancock et al., 2018), finding that both treatments were more effective than a waitlist control, with similar effect sizes (and recovery rates of 31% for ACT, 40% for CBT, compared to 8% for the waitlist control). Bringing this together, at this stage we are in a strong position to conclude that CBT is effective for anxiety disorders in children and young people compared to wait lists and attention controls (e.g., Hudson, Rapee, et al., 2009). However, we do not currently have strong evidence to conclude that any other psychological intervention is effective, yet also have only limited evidence that CBT is better than other psychological approaches that are used in practice.

Specific considerations for different age groups. RCTs have tended to include children from across broad age ranges between 7 and 18 years and there has been limited attention to the specific treatment needs of children and young people of different ages. Within the Zhou et al (2018) review, only 14/101 trials specifically focused on preadolescents (i.e. those younger than 11 years) and only 23 focused specifically on adolescents (i.e., those aged 11 or older), with the rest spanning these age-ranges. This is surprising given the differing clinical characteristics of children and adolescents, with pre-adolescents being significantly more likely to have separation anxiety disorder, and adolescents significantly more likely to have primary

social anxiety disorder, a comorbid mood disorder, more severe anxiety and school attendance difficulties (Waite & Creswell, 2014).

(i) Pre-adolescents

Where psychological interventions have been looked at for younger children in their own right they have, overall, provided evidence for effectiveness (e.g. Zhang et al., 2017), however there has been wide variability in the approaches taken, with some focusing specifically on the more common anxiety disorders in early childhood (e.g. separation anxiety disorder (Schneider et al., 2011), selective mutism (e.g. Oerbeck et al., 2014), while others have included children with a broad range of anxiety disorders. A key difference in the delivery of interventions for younger children tends to include a greater focus on parental involvement, with evidence supporting the effectiveness for treatments delivered entirely via parents (e.g. Cartwright-Hatton et al., 2011) and, in some cases, suggesting that similar outcomes can be achieved to those where children and parents are provided treatment in parallel (i.e. where twice as much therapy resource is provided; Waters et al., 2009) suggesting that working via parents has the potential to provide a cost-effective approach to treatment for pre-adolescent children. However, given that some trials have showed less favourable outcomes for the parent-only approach (Monga et al., 2015), further research is needed to identify how to optimise both parental engagement and child outcomes through this promising treatment approach.

(ii) Adolescents

Where studies focus specifically on adolescents, the majority of RCTs have involved young people with primary social anxiety disorder (e.g., 62% of adolescent studies in Zhou et al., 2019) and those with large effect sizes have tended to include young people identified through screening in schools and include sessions within and outside schools to practice social skills (Masia-Warner et al., 2005; Masia Warner, Fisher, ShROUT, Rathor, & Klein, 2007). Given these trials involve young people who are regularly attending school, it is unclear to what extent the

findings will extend to those young people who experience high avoidance (and potentially symptom severity) which has led to difficulties attending school. Further research is clearly needed to identify how to optimize treatments for the full range of anxiety disorders experienced by adolescents, given the specific and challenging demands encountered during this transformational phase of life (Blakemore, 2018).

Psychological interventions for populations at particular risk. Elevated rates of anxiety disorders are often observed in particular populations such as children with physical health conditions (Pao & Bosk, 2011), intellectual disabilities (Maiano et al., 2018; Pao & Bosk, 2011), reading problems (Francis, Caruana, Hudson, & McArthur, 2019), and ASD (Kerns & Kendall, 2012). Treatment programs have been developed for these specific populations, however they have received limited evaluation to date with the exception of the treatment of anxiety disorders in the context of ASD.

Adaptations of CBT programmes to treat anxiety disorders in the context of ASD have typically aimed to ensure the delivery and content of treatment accounts for the sensitivities, unique symptoms and the visual and concrete learning styles commonly observed in children with ASD, for example by increased use of visual aids, more structure, longer therapy length, and an increased focus on relaxation and exposure homework (e.g., Chalfant, Rapee, & Carroll, 2007). While meta-analyses support the efficacy of CBT compared to waitlist controls (James, James, Cowdrey, Soler, & Choke, 2013), it appears that treatment gains may be less likely to generalise to comorbid anxiety conditions with only 12.2% of children with ASD displaying full recovery at post treatment (36.7% at follow-up; Warwick et al., 2017). Furthermore, the treatments that have been evaluated have typically been lengthy (with a recent study failing to find evidence of effectiveness of a low intensity, online treatment for children with ASD

(Conaughton, Donovan, & March, 2017) and have, to date, neglected severely affected and/or non-verbal autistic children and young people.

How to improve psychological treatments? In order to improve outcomes for children and adolescents with anxiety disorders, we need to develop and refine our “gold-standard” treatments, improve their translation into routine clinical settings and create sustainable environments within services that support their delivery. Exposure has been shown to be an important part of treatment (Ale et al., 2015; Peris et al., 2015b; Whiteside et al., 2015); however, the extent to which (adult) contemporary models of exposure, and their application to optimise exposure (Craske et al., 2008), apply to children and adolescents remains unclear. Going forward, it will be important to understand what strategies promote new learning through exposure in young people at different stages of development, using treatment dismantling and experimental approaches, and to ensure that these are integrated into treatments (Waters & Craske, 2016). The use of technological advances, such as virtual reality, shown to be effective in delivering exposure in adults in a number of studies (e.g., Freeman et al., 2018), may also enable better and more meaningful in-session exposure; early signs are promising that virtual environments invoke anticipatory anxiety and are an acceptable medium for young people with social anxiety disorder (Parrish, Oxhandler, Duron, Swank, & Bordnick, 2016) and specific phobias in the context of ASD (Maskey, Lowry, Rodgers, McConachie, & Parr, 2014). Gamification may also increase young people’s engagement and willingness to undertake key elements of treatment (Fleming et al., 2017).

At the moment, our standard approaches to treatment rely on a ‘one size fits all’ model. One of the potential ways in which we could improve outcomes is by personalising treatment to the individual needs and diagnostic profile of the young person and their family. Disorder-specific

(e.g., Ingul, Aune, & Nordahl, 2014) and modular treatments may be one approach to achieve this (e.g., Weisz et al., 2012). However, to sufficiently refine this approach we need maintenance-focused, disorder specific models (Halldorsson & Creswell, 2017) and to invest in large clinical trials and/or large data collaborations, to not only improve our understanding of predictors of psychological treatments, but also to improve our understanding of treatment mediators and moderators so that we can work towards more personalised approaches.

As we develop more targeted treatments, we also need to ensure that these are effectively implemented in routine practice. Successful implementation relies on a range of factors including clinicians' knowledge about the effectiveness of interventions and their attitudes towards the intervention, as well as the provision of training and supervision to clinicians (Gunter & Whittal, 2010). Indeed, these factors appear to be particular barriers to the implementation of evidence-based treatments for child anxiety disorders. For example, Whiteside and colleagues found that, not only did clinicians in routine clinical settings water interventions down to make them shorter (Voort, Svecova, Jacobson, & Whiteside, 2010), they also rarely delivered exposure within treatment due to negative beliefs relating to safety, tolerability and ethics (Whiteside et al., 2016). Furthermore, skills shortages in CBT have been documented through national surveys of clinicians (Stallard, Udwin, Goddard, & Hibbert, 2007), although there are recent examples of programmes to increase the number of clinicians trained in evidence-based treatment, such as the Children and Young People's Improving Access to Psychological Therapies (CYP-IAPT) program in England (Fonagy, Pugh, & O'Herlihy, 2017). It will be essential that ongoing efforts to train and supervise clinicians address not only knowledge and skills but also attitudes to ensure effective treatments are delivered in practice.

Improving access to psychological treatments. Even with the above adherence issues in mind, a very small proportion of children and adolescents who could benefit from interventions actually reach these interventions at all. In a recent study, only 2% of children with anxiety disorders identified in the community in England had received CBT (Reardon, Harvey, & Creswell, 2019). These findings are in keeping with previous studies indicating low rates of service utilisation more broadly in the UK, Australia and USA (Green, McGinnity, Meltzer, Ford, & Goodman, 2005; Lawrence et al., 2015; Merikangas et al., 2011). Barriers that parents frequently reported related to difficulties differentiating between developmentally appropriate and clinically significant anxiety, a lack of help-seeking knowledge, perceived negative consequences of help-seeking, and limited service provision (Reardon, Harvey, et al., 2019). These findings highlight the need for tools to help identify young people who may benefit from professional support to overcome difficulties with anxiety difficulties, as well as increased evidence-based provision for the treatment of anxiety disorders in children and young people.

One mechanism with potential to increase access to evidence-based interventions is a stepped-care model in which the least costly intervention is delivered initially, with more intensive (/expensive) interventions reserved for those who do not, or can be predicted not to, benefit from the first step treatment (Bower & Gilbody, 2005). A number of promising low intensity approaches (i.e., brief and deliverable by non-specialist therapists) have been developed and evaluated in recent years. For example, for pre-adolescents there is now good evidence that brief therapist-guided parent-led CBT (or parent-led bibliotherapy) is effective (e.g. Cobham, 2012; Rapee, Abbott, & Lyneham, 2006; Thirlwall et al., 2013), more cost-effective than an alternative brief intervention (Creswell et al., 2018), and similar outcomes can be achieved when delivered by non-specialist and specialist therapists (Thirlwall et al., 2013). In terms of low intensity approaches for adolescents, there is promising evidence that online CBT may be

a useful approach (Pennant et al., 2015; Spence et al., 2011) although positive benefits are less clear in routine practice (Waite, Marshall, & Creswell, 2019) and implementation remains a challenge for the field (e.g., Hill et al., 2018). Nonetheless, this appears to be an appealing mode of treatment delivery for at least some young people (e.g. Lenhard et al., 2016) that provides a valuable potential mechanism for delivering treatments at scale, enhancing treatment fidelity, and analysing the effects of specific treatment components for young people with particular characteristics.

In the first systematic evaluation of a stepped care treatment approach for child anxiety disorders, (Rapee et al., 2017) found that overall stepped care, comprising (i) low intensity CBT (parent-led bibliotherapy for under 13 year olds and computerised self-help for those 13 years or older), followed by (ii) standard individual CBT, and then (iii) individually tailored treatment, obtained similar outcomes to standard CBT, although stepped care required significantly less therapist time. While this time saving did not result in reduced health care costs, it did translate to lower costs from a societal perspective (including costs incurred by families; (Chatterton et al., 2019). Notably, the authors highlight that the final step in the stepped care model failed to deliver particularly strong additional benefits, which likely reduced the economic advantage of the stepped care intervention. Before widespread adoption, future studies are now required to refine stepped care models to maximise the cost-effectiveness of each step, including consideration of the most appropriate staff and setting for each step, and with a greater understanding of what is needed for those young people who fail to benefit from low intensity interventions.

Treatment: pharmacological interventions

Existing evidence suggests that some pharmacological treatments produce similar effects to psychological treatment in the short-term. For example, in their Cochrane review of pharmacological treatments of anxiety disorders in children and young people, Ipser, Stein, Hawkrigde, and Hoppe (2009) found that 58.1% of participants respond to anti-depressant medication (particularly Selective Serotonin Reuptake Inhibitors (SSRIs)), compared to placebo medication which resulted in a remission rate of 31.5% (Ipser et al., 2009). Similarly, Wang et al (2017) concluded that SSRIs, serotonin-norepinephrine reuptake inhibitors, and CBT were all effective in reducing anxiety symptoms while tricyclics and benzodiazapines had limited effect on anxiety symptoms. However, pharmacological interventions are not generally recommended as a first line treatment due to patient preference (Brown et al., 2007), higher attrition than found for psychological therapies and potential adverse events. For example, increased rates of mild to moderate side effects have been reported in SSRI vs placebo conditions for children/adolescents such as fatigue, tremor, insomnia, drowsiness, and nausea (Wang et al., 2017). Nevertheless, SSRIs (especially Sertraline) appear to be well-tolerated in as much as severe side-effects are relatively rare in paediatric samples (Ipser et al., 2009); (J. S. March et al., 2004; Walkup et al., 2008). Yet, there are still relatively few studies that have examined the long-term effects of medication on anxiety symptoms or on the developing brain. There are also limited investigations of the outcomes after medication has ceased and few studies have examined the impact and acceptability in the context of particular comorbidities or with particular populations (e.g., children with ASD).

Treatment: combined interventions

In one of the largest trials with the longest follow-up period of pharmacological and psychological treatments, Walkup and colleagues (2008) evaluated the efficacy of combining psychological and pharmacological treatment to improve outcomes for children with anxiety

disorders. The authors concluded that combining CBT + SSRI (Sertraline) treatments produced more than 20-25% greater improvement than CBT alone, SSRI alone or placebo alone. At the 24 week and 36 week follow-up periods, combined treatment continued to show enhanced outcomes (Piacentini et al., 2014); however, in a follow-up 4 to 12 years later all three treatment conditions were comparable. Notably, in this study, families allocated to combined therapy received a greater dose of therapy (including visits with both a psychologist and a psychiatrist) and were aware they were receiving the 'best' dose. Future evaluations of combined treatments should also include CBT + pill placebo conditions to control for these potential expectation effects.

Summary and recommendations

Anxiety disorders are extremely prevalent in childhood and adolescence, appear to be on the rise, and can cause lifelong impairment - yet very few children access evidence-based treatments. Developing further understanding of the cognitive, behavioural and environmental factors that contribute to the maintenance of anxiety disorders and to treatment outcomes in both psychological and pharmacological therapies, and how these operate across development and among particular populations, will be critical to enable us to continue to improve outcomes for children and young people. However, in parallel we must urgently address the desperate lack of access to evidence-based treatments that families encounter, through the provision of effective, efficient treatments that can be implemented in ways that preserve their effectiveness in routine clinical practice. Developments in technology provide great potential to deliver interventions at scale in ways that preserve integrity, for example, using virtual reality and online interventions- though it will be critical that these are developed and implemented in ways that maximise not only outcomes but engagement of children, young people and carers (e.g. Hill et al., 2018) to ensure that the potential widespread benefits are realised. While this

review has focused on treatment, the issues raised also highlight the importance of preventing the emergence of anxiety problems among children and young people who are at risk of their development. This has the potential to bring advantages from intervening before patterns of responding (among the child and those around them) become ingrained and more difficult to reverse (Donovan & Spence, 2000), and by reducing the burden on families and services by minimizing the distress and costs associated with childhood anxiety disorders. Few studies have to date evaluated the effect of preventative programmes on the emergence of anxiety disorders among ‘at risk’ populations (Lawrence, Rooke, & Creswell, 2018), however those that have certainly look promising (e.g. Ginsburg et al., 2015). In addition to advances in treatment research, future research is sorely needed to establish when, with whom, and how to best target prevention to optimise accessibility, engagement, and effectiveness (Lawrence, Rooke, & Creswell, 2017).

Key points

Key practitioner messages:

- Assessment of anxiety disorders should routinely involve valid and reliable interview and questionnaire measures of anxiety disorders and other common comorbid problems
- Cognitive Behaviour Therapy is effective for treating anxiety disorders in children and young people
- There is currently insufficient evidence for the effectiveness of any other psychological treatment
- There is evidence that SSRIs are effective in the short-medium term, but there is a lack of longer-term evaluation
- Few children who could benefit receive treatment for anxiety disorders. Brief guided interventions that can be delivered by non-specialists are effective for some pre-adolescent children and provide a means to increase access to psychological interventions, potentially within a stepped-care model, but less is known about their effectiveness for adolescents

Areas for future research:

- Experimental studies to elucidate (cognitive, behavioural, environmental) maintenance mechanisms of anxiety disorders and how they vary across childhood and adolescence and in particular contexts
- Sufficiently large treatment studies to examine predictors, mediators and moderators of treatment to help optimise treatment outcomes and support improvements in personalised care
- Use of technology to promote engagement, access, integrity, efficiency and effectiveness of treatments

- Comparisons of different treatment approaches that are fully powered to detect meaningful clinical differences, with appropriate control conditions (e.g. including placebo where appropriate)
- Health economic evaluations to enable health services to increase access by offering the most efficient treatment approaches
- Implementation research to maximise application and integrity of evidence-based treatments in routine clinical practice

Table 1. Characteristics and prevalence of DSM-5 anxiety disorders in children and adolescents

Anxiety disorder	Clinical characteristics	Recent example prevalence figures (%)¹
Separation anxiety disorder	Excessive fear of separation from primary caregiver(s)	0.7
Specific phobia	Marked fear or anxiety about a specific object or situation (e.g., an animal, injections, vomit) that almost always provokes immediate fear or anxiety	0.8
Social anxiety disorder	Marked fear or anxiety about social situations in which the young person is exposed to possibly scrutiny by others, and fears they will act in a way or show anxiety symptoms that will be negatively evaluated	0.8
Generalised anxiety disorder	Excessive and uncontrollable worry about a number of events or activities, associated with at least 3 symptoms (e.g., muscle tension, difficulty concentrating, sleep disturbance)	1.5
Panic disorder	Recurrent, unexpected panic attacks that which are not restricted to a particular situation and concern about future attacks and/or a change in behaviour related to the attacks	1.1
Agoraphobia	Marked fear or anxiety about 2 or more of the following situations: using public transport, being in open spaces,	0.5

	being in enclosed spaces, being in a crowd or standing in a line, or being outside of the home alone	
Selective mutism	Consistent failure to speak in specific social situations (e.g., school) where there is an expectation to speak, despite speaking in other situations	0.18-1.90% ²

Note.

Prevalence data is from NHS Digital (Vizard, 2018) for all anxiety disorders except selective mutism. We have not combined with other recent prevalence studies as data are not comparable due to different time periods covered (e.g., Spence, Zubrick, & Lawrence, 2018).

¹Figures represent point prevalence (proportion who meet criteria for a diagnosis at a specific point in time).

²Figures taken from Muris and Ollendick's (2015) review; the variation in prevalence rates identified is likely to be due to variability in the strictness of the diagnostic criteria employed.

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