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Exploring How Effective, Acceptable, and Practical a CBT–Sensory Modulation Approach Is for Supporting Children Aged 4–7 Experiencing Anxiety

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ABSTRACT

Background: Childhood anxiety is an increasing concern globally, with rates rising significantly following the COVID-19 pandemic. However, there are relatively few evidence-based interventions specifically designed to directly target and involve younger children under 7 years old. To address this gap, a six-session manualised programme was developed to assist children aged 4–7 in managing their anxiety. The programme integrates Cognitive Behavioural Therapy (CBT) with Sensory Modulation (SM) strategies, providing simple and practical tools to aid young children in coping with anxiety. This study aimed to evaluate the effectiveness, acceptability, and practicality of this CBT-SM intervention when delivered through community-based child and adolescent mental health services (CAMHS).

Methods: A single-case experimental design (SCED) was employed, involving six children diagnosed with anxiety across two sites. At least three children were reported to have sensory challenges. A psychologist assessed the children's anxiety at three intervals: at the beginning of the study, after the intervention was completed, and 4 weeks later. Parents also completed questionnaires measuring behavioural issues (both internalising and externalising) and the impact of anxiety on daily life at baseline, prior to treatment, and after treatment.

Results: The study revealed significant reductions in anxiety and improvements in overall functioning. Both parents and therapists reported the programme as acceptable. Notably, four out of six children (67%) no longer met the criteria for an anxiety diagnosis following the intervention and at follow-up.

Conclusions: These findings provide preliminary support for the effectiveness, acceptability, and practicality of this innovative CBT-SM approach in assisting young children in managing anxiety.

1 | Introduction

Anxiety disorders are common in children (Creswell and Waite 2016; Seligman and Ollendick 2011), with prevalence estimates ranging from 9% to 27%, and separation anxiety being the most frequently diagnosed (American Psychiatric Association 2013). A recent study found that 20% of young people globally experience symptoms of anxiety or stress reactions, with particularly high rates in Denmark (44%), Canada (45%), and the United States (32%) (Mendelsohn et al. 2024). In New Zealand, anxiety disorders affect 3.9% of children aged 2–14 years (The Werry Workforce - Whāraurau 2021), and approximately 4% have been diagnosed with an emotional or behavioural problem at some point (Health and Disability Commission 2018).

Summary

- There are limited interventions available that are specifically designed to directly support young children aged 4–7 years in addressing their anxiety.
- Findings suggest that a structured, manualised CBT-Sensory Modulation (CBT-SM) intervention may have the potential to reduce anxiety in young children effectively. The intervention may also be helpful for children with a primary diagnosis of anxiety only and those with anxiety and sensory challenges.
- Sensory strategies may support emotional regulation and reduce anxiety in children with anxiety and co-occurring sensory regulation difficulties, and may be a helpful anxiety intervention in addition to cognitive behavioural therapy.
- The results also show that participating children experienced improvements in their overall daily functioning.
- The therapists and parents who participated in the study felt the intervention worked well in practice and was acceptable for use with the children.

Common anxiety disorders include separation anxiety, social anxiety, phobias, and generalised anxiety disorder (American Psychiatric Association 2013). Symptoms vary by developmental stage, from separation anxiety in infancy to social anxiety in adolescence (Manicavasagar and Silove 2020). Persistent anxiety is linked to academic and social difficulties, depression, and long-term psychiatric problems (Creswell et al. 2014; Van Steensel and Bögels 2015), with children from lower socioeconomic backgrounds at greater risk (Elgar et al. 2015).

In early childhood, anxiety is associated with lower academic achievement, social isolation, and higher risk of mood disorders, substance use, and suicidal behaviour (Afshari et al. 2014; Creswell et al. 2014). Socioeconomic disparities also affect access to mental health services, leaving disadvantaged children particularly vulnerable (Elgar et al. 2015; Phelan et al. 2010; Reiss et al. 2019). Despite its prevalence, childhood anxiety often goes undiagnosed and untreated due to barriers such as limited service access, long wait times, lack of trained professionals, stigma, and financial constraints (Creswell et al. 2014; Creswell et al. 2023; Hansen et al. 2021). Early intervention is critical, as untreated anxiety can become more complex and harder to manage in adulthood (Neufeld et al. 2017; Wainberg et al. 2017).

1.1 | Cognitive-Behavioural Therapy for Childhood Anxiety

Cognitive Behavioural Therapy (CBT) is the most evidence-based psychological intervention for childhood anxiety (James et al. 2020; Sigurvinsdóttir et al. 2019). Developed by Beck (1970), CBT combines cognitive restructuring with behavioural techniques to modify maladaptive thought patterns (Fenn and Byrne 2013), including identifying negative thoughts, replacing them with adaptive ones, and using exposure strategies to reduce avoidance (Brewin 1996; Hofmann et al. 2012). Systematic reviews and meta-analyses confirm its effectiveness in reducing anxiety symptoms in children (Fisak et al. 2018; Guo et al. 2021; James et al. 2020), with gains maintained for up to 5 years post-treatment (Barrett et al. 1996; Brown et al. 2018). Studies that have focused on the 4–7-year-old age group and younger are limited compared to those for children older than 8 years, but have shown significant results on the effectiveness of CBT in the treatment of childhood anxiety (Abel et al. 2025; Hirshfeld-Becker et al. 2010; Hirshfeld-Becker et al. 2019).

Most studies, however, focus on children over 7 years, leaving limited evidence for younger children (Cartwright-Hatton et al. 2004; Creswell et al. 2014). CBT may be less effective for younger children due to limited cognitive and verbal abilities (Garber et al. 2016; Halder and Mahato 2019), as children under seven often struggle with abstract thinking (Grave and Blissett 2004; Piaget 1962). To address this, adaptations such as play, storytelling, parent or caregiver involvement, and sensory-based strategies have been suggested to make CBT developmentally appropriate (Cheng et al. 2019; Johnston 2020). These adaptations informed the development of the CBT-Sensory Modulation (CBT-SM) manualised intervention, which was tested and is presented in this paper.

A number of manualised CBT programmes have been created and tested for children with anxiety. While most have shown positive results, they also come with certain limitations that are relevant to this study. Of the identified studies that were reviewed for this project, the most substantial evidence was found in programmes for children over the age of seven, such as those developed by Girling-Butcher and Ronan (2002), Khanna & Kendall (2008), and Rapee et al. (2006). Other programmes reviewed for this study were more limited, highlighting the gaps that this current study intended to answer, which is testing an intervention that directly involves young children in therapy supported by their parents. For instance, one was a school-based prevention programme that focused on building resilience rather than treating clinical anxiety (Barrett et al. 2015). Others centred on training parents rather than directly involving children (Abel et al. 2025; Bayer et al. 2011). A third showed potential but had little evidence to confirm its effectiveness (Minde et al. 2010). The fourth one was the Cool Little Kids programme (Bayer et al.2011), which was aimed at children with general emotional difficulties, not specifically those with diagnosed anxiety. With the exception of Minde et al. (2010) and the Coping Kiwi programme (Girling-Butcher and Ronan 2009), all of these were delivered in group settings. Importantly, none of them included sensory strategies as part of their approach.

1.2 | Sensory Modulation as an Alternative Intervention

Sensory modulation is an intervention increasingly used in mental health practice, with the aim of regulating emotional and physiological responses through sensory input (Brown et al. 2018). The approach employs strategies such as deep pressure, weighted blankets, music, and aromatherapy to reduce physiological arousal and promote relaxation

(Champagne 2011a; Moore 2016), which can be particularly useful for children who may struggle with traditional CBT due to cognitive limitations (Halder and Mahato 2019). Grounded in Ayres (1972) sensory integration theory, sensory modulation is based on the premise that the brain processes and integrates sensory input to generate appropriate behavioural responses. Anxiety is associated with sensory sensitivity and heightened autonomic nervous system activity, which sensory strategies can help regulate (Chu et al. 2024; McCarty 2016). For example, deep pressure stimulation activates the parasympathetic nervous system, promoting relaxation (Champagne 2010; Porges 2009).

Although most research has focused on adult mental health settings (Blackburn et al. 2016; Champagne 2011b; Kandlur et al. 2023), preliminary evidence suggests sensory modulation may benefit children experiencing mental health issues. Sensory-based interventions have been applied successfully in trauma treatment (Finn et al. 2018; Purvis et al. 2013; Ryan et al. 2017) and perioperative care to reduce anxiety (Ahmed et al. 2011; Reynolds et al. 2023). Multi-sensory rooms and sensory kits have also shown promise in promoting self-regulation and reducing anxiety in mental health contexts (Cameron et al. 2020; Sutton et al. 2013). Combining sensory modulation with CBT has been explored in adult PTSD treatment, demonstrating improved emotional regulation (Champagne 2011b). While direct evidence for its efficacy in childhood anxiety remains limited, its physiological basis supports its potential utility in this population (MacLennan et al. 2021; McMahon et al. 2019).

1.3 | Combining Cognitive Behavioural Therapy and Sensory Modulation

Given the limitations of CBT for young children, integrating sensory modulation strategies may enhance its effectiveness (Steele and Kuban 2013). Sensory techniques provide a bridge for children who find the cognitive demands of CBT challenging, making interventions more accessible and developmentally appropriate (Garber et al. 2016; Grave and Blissett 2004). They can also help regulate physiological symptoms of anxiety, such as hyperarousal, as well as avoidance behaviours (Afshari et al. 2014). For instance, sensory tools like weighted blankets or rhythmic movements can be combined with traditional CBT techniques, such as graded exposure to uncomfortable stimuli, to reduce distress and physiological arousal (Champagne 2011a; Porges 2009).

1.4 | Justification for the Present Study

Despite the high prevalence of childhood anxiety, few interventions are specifically designed to directly target and involve children under seven (Creswell et al. 2014). Although CBT remains the gold standard, its cognitive demands may limit its effectiveness in younger children (Halder and Mahato 2019). Sensory modulation offers a promising complementary or alternative approach, targeting physiological responses with minimal cognitive requirements (Garber et al. 2016). This study examined the integration of sensory modulation with CBT to develop a tailored intervention for young children with anxiety, including parental involvement. The aim was to evaluate its effectiveness, acceptability, and practicality within community-based child and adolescent mental health services (CAMHS). The broader goal was to create an intervention that allied health professionals and teachers could deliver to provide early support, reduce wait times, and improve outcomes for children. However, such implementation requires that the intervention first be thoroughly tested using robust methods, which was the focus of the current study.

2 | Methods

This study aimed to evaluate the effectiveness, acceptability, and practicality of a CBT-Sensory Modulation (CBT-SM) intervention within community-based child and adolescent mental health services (CAMHS). Two hypotheses guided the study:

1. A modified CBT-SM intervention will be effective in reducing anxiety in children aged 4 to 7 years diagnosed with clinical anxiety.
2. A modified CBT-SM intervention will improve overall functioning in children aged 4 to 7 years diagnosed with clinical anxiety.

The study employed a randomised multiple-baseline, non-concurrent single-case experimental design (SCED) (Krasny-Pacini and Evans 2018), supplemented by subjective feedback collected from clinicians and families. This methodology is particularly appropriate for testing novel interventions in practice, especially when recruiting a large sample is challenging. The design involved collecting multiple baseline measurements, allowing each participant to serve as their own control (Krasny-Pacini and Evans 2018). The number of baseline measurements was randomly assigned to participants (either 3, 4, or 5), and the commencement of the intervention was staggered. The aim of this variation was to test if significant changes only occurred when the intervention was applied and not due to other extraneous events (Krasny-Pacini and Evans 2018).

2.1 | Procedure

Six children aged 4–7 years (2 boys and 4 girls; mean age 6 years 4 months, SD = 1.02 years) participated in the study across two sites: a secondary CAMHS and a primary care CAMHS. Families were informed about the study during their scheduled mental health assessments at the sites. Parents who expressed interest met with the researcher to receive further information. A clinical psychologist evaluated each child through a combination of clinical interview with the child and parent, as well as psychometric assessment and observation. Those meeting the criteria for at least one anxiety disorder according to the DSM-5 (American Psychiatric Association 2013) were recruited. The six participants were diagnosed with a range of anxiety disorders, including separation anxiety disorder ($n = 2$), generalised anxiety disorder ($n = 3$), and social anxiety disorder ($n = 2$, one with comorbidity). At enrolment, none of the children were receiving other mental health services. Written consent was obtained from parents, and written assent was provided by the children.

Upon entry, participants were randomly assigned to a baseline period of 3, 4, or 5 weeks. Data collection began with confirmation of an anxiety disorder diagnosis, followed by baseline measures to establish each child's level of anxiety prior to the intervention. Baseline data were collected for all participants, and the intervention was introduced systematically at the conclusion of each child's baseline period. Primary outcome measures included anxiety symptoms (parent report) and anxiety interference or functional impact (child and parent reports), as outlined in Table 1.

In addition to the multiple baseline assessments, parents and children completed the full battery of measures pre-treatment, mid-treatment, post-treatment, and at 1-month follow-up (see Table 1). At post-treatment and follow-up, the psychologist re-assessed the children's anxiety levels. The acceptability and practicality of the intervention were evaluated using session and outcome rating scales collected after each session, as well as a Parent Satisfaction Questionnaire completed post-treatment. Therapists were also invited to provide qualitative feedback via a Therapist Satisfaction Questionnaire regarding their experience delivering the intervention.

The intervention was delivered to the children individually by four different therapists, whose profiles are described in the therapist profiles section. The intervention was delivered face-to-face weekly using the manual, as they had been trained to do. Two therapists worked at the primary care organisation, and the other two worked at secondary mental health services.

2.2 | Therapist Adherence and Fidelity

Therapist intervention adherence and fidelity were evaluated using multiple methods. All 36 therapy sessions were audio recorded, and six sessions (16.67%), a representative sample of all sessions (1–6), were randomly selected for review and coding to assess therapist adherence and fidelity. The lead researcher and an independent, experienced psychologist working in mental health reviewed the six randomly selected sessions and coded them. Therapist adherence and fidelity were then calculated using Cohen's kappa. The coding process was evaluated by calculating the interrater reliability between the lead researcher and the independent psychologist.

2.3 | Inclusion and Exclusion Criteria

Children were considered eligible for the study if they had a confirmed diagnosis of at least one anxiety disorder, such as Generalised Anxiety Disorder or Separation Anxiety Disorder, established through a clinical psychologist assessment and corroborated by medical or psychological records. Participants were aged between four and 7 years and required at least one parent or guardian willing and able to participate fully in the intervention. Both the

TABLE 1 | Study measures.

Anxiety symptoms (diagnostic)	**Focus of measure**
The School Anxiety Scale Teacher Report Form *(SAS-TR)* (Hajiamini et al. 2012; Lyneham et al. 2008).	Child's anxiety at school (teacher report)
The Child Behaviour Checklist *(CBCL)* (Achenbach and Rescorla, 2001).	Child's behavioural, social, and emotional issues (parent report)
The Teacher Report Form *(TRF)* (Achenbach, 1991)	Child's behavioural, social, and emotional issues (teacher report)
Anxiety interference (Functional impact)	**Focus of measure**
The Child Anxiety Life Interference Scale (*CALIS-P, Parent form*) for 6 to 17-year-olds. (Lyneham et al. 2013).	Impact of anxiety on school-aged children's everyday life (parent report)
The Child Anxiety Life Interference Scale (*CALIS-C, Child form*) for 6 to 17-year-olds. (Lyneham et al. 2013).	Impact of anxiety on school-aged children's everyday life (child report)
The Child Anxiety Life Interference Scale (*CALIS-PV, Pre-School-Version*) for 3 to 5-year-olds. (Lyneham et al. 2013).	Impact of anxiety on pre-school-aged children's everyday life (parent report)
Behaviour Tracking Diary *(BTD)*	Tracks change in anxiety-related behaviours of concern (parent report)
Acceptability and Practicality of Intervention	**Focus of measure**
Outcomes Rating Scale - Child *(C-ORS)* and Young Child *(YC-ORS)* versions (Miller et al. 2001).	Perceived progress while participating in therapy (parent and child report)
Session Rating Scale, Child *(C-SRS)*, and Young Child *(YC-SRS)* versions. (Miller et al. 2001).	Therapeutic alliance with mental health clinician (parent and child report)
Parent Satisfaction Questionnaire *(PSQ)*	Overall satisfaction with intervention (parent report)
Therapist Satisfaction Questionnaire *(TSQ)*	Overall satisfaction with intervention (therapist report)

TABLE 2 | Participant profiles.

Andy	Andy, aged 5 years and 10 months, was an only child living with his single mother and had limited contact with his father. He presented with separation anxiety, constipation related to anxiety about toileting, and sensory sensitivities, including fears around water and water-based activities. Andy exhibited clinginess, struggled with kindergarten and school drop-offs, and required reassurance from his mother, settling only minutes after separation. His anxiety extended to daily routines, such as bathing and using unfamiliar toilets. Andy was diagnosed with Separation Anxiety Disorder, with pre-intervention challenges including distress during separations, avoidance of water activities, difficulty managing toileting anxiety, and sensitivity to specific sensory stimuli.
Esther	Esther, aged 4 years and 7 months, lived with her mother, stepfather, older sister, and younger half-brother. Her older sister's frequent behavioural outbursts influenced Esther's emotional responses and social interactions. She displayed clinginess in new situations, sought constant reassurance from her mother, and had difficulty expressing emotions verbally. Esther experienced worries about seemingly random events and often reported stomach aches in anxiety-provoking contexts. Assessment revealed an anxious temperament, specific fears (e.g., wind), sensory sensitivities, and separation anxiety related to transitions such as starting kindergarten or her mother leaving. These symptoms, together with family stressors, led to a diagnosis of Separation Anxiety Disorder, with pre-intervention challenges including avoidance of new environments, dependence on her mother, and limited social engagement with peers.
Collin	Collin, aged 6 years and 3 months, was a boy presenting with separation anxiety, primarily around school drop-offs. He frequently complained of stomach aches and headaches, cried, and begged to stay home, sometimes being kept home due to extreme distress. Separation anxiety extended to social situations, including playdates, sleepovers, and playground interactions, where he exhibited excessive worry and tearfulness. These symptoms occurred within a context of family stressors, including COVID-19 infection and a house move. Collin was diagnosed with Separation Anxiety Disorder, with pre-intervention challenges including school avoidance, distress upon leaving home, difficulty separating from his mother, and reluctance to engage socially with peers or spend time with his father.
Ben	Ben, aged 6 years and 10 months, was an only child living primarily with his single mother and maintaining regular contact with his father and his father's new family. He had a close attachment to his mother and experienced intense distress during separations, including school drop-offs and visits to his father, often described as “meltdowns.” Ben struggled to socialise with peers without adult support and frequently worried about past events, changes to plans, and pressure situations. Family stressors, including his mother's pregnancy, a new partner, financial strain, and COVID-19 disruptions, compounded his anxiety. Ben was diagnosed with Generalised Anxiety Disorder and Separation Anxiety Disorder, with somatic complaints and social difficulties.
Dorothy	Dorothy, aged 7 years and 5 months, was an only child living with her employed parents. She presented with longstanding anxiety, including social avoidance, distress at school drop-off, and somatic symptoms such as stomach aches and vomiting in anxiety-provoking situations. Dorothy had difficulty interacting with peers, preferred one-on-one play, and required constant parental reassurance. She exhibited sensory sensitivities to loud noises, bright lights, fabrics, and smells, and was highly distressed by changes in routine or surprises. Dorothy was diagnosed with Separation Anxiety Disorder, with symptoms exacerbated by school transitions, novel social settings, and past negative experiences, including swimming lessons, leading to high anxiety in multiple contexts.
Fred	Fred, aged 7 years and 7 months, was a boy presenting with behavioural difficulties at school and a history of ADHD, managed with stimulant medication. He experienced separation anxiety as a toddler and during kindergarten and displayed aggression toward peers when anxious. Early occupational assessment indicated challenges with sensory processing. Fred's anxiety occurred within the context of parental separation and prior family stressors. He exhibited generalised worries about COVID-19, religion, and death, and had attachment difficulties. Fred was diagnosed with Generalised Anxiety Disorder and Separation Anxiety Disorder, with pre-intervention challenges including social avoidance, heightened anxiety in novel or school-related situations, and difficulty managing emotions around peers.

child and their caregiver needed to be available throughout the 18-week study period and able to communicate in everyday English. Exclusion criteria included the presence of comorbid conditions such as Autism Spectrum Disorder, Oppositional Defiant Disorder, or psychosis, as well as intellectual disability, selective mutism, or attachment disorders. Children with a history of significant trauma, including post-traumatic stress disorder or sexual abuse, were also excluded. Additionally, children who were currently prescribed psychiatric medications, experiencing anxiety of such severity that waiting up to 8 weeks for treatment was not feasible, or who were already receiving psychological treatment for anxiety, were not eligible.

2.4 | Participant Profiles

Each participant's profile, including home context, presenting issues, and diagnosis, is presented in Table 2.

2.5 | Intervention Development

The intervention was informed by the Coping Kiwi manual (Girling-Butcher and Ronan 2002), Tina Champagne's sensory modulation work (Champagne and Stromberg 2004; Champagne 2010, 2011a), and the work of Wood and McLeod (2008). The first three sessions were adapted from Coping Kiwi, with simplified language and shorter session lengths for younger children. Sessions 4 to 5 drew directly on Champagne's sensory modulation work, supporting children to develop personalised calming strategies based on their sensory preferences. Treatment followed Wood and McLeod's KICK plan (Knowing when you are nervous, Identifying icky thoughts, Calming your thoughts, Keep practising), with an additional "I" (Interests) added to create the IKICK plan. This adaptation enabled therapists to integrate children's personal interests into therapy and tailor sensory-based strategies. Structural changes also included the integration of feedback-informed treatment measures. The Outcome Rating Scale (ORS) and Session Rating Scale (SRS) (Miller et al. 2001) were introduced at sessions two to six to strengthen the therapeutic alliance and track progress through child and parent feedback.

2.6 | Cultural Considerations

Māori cultural consultation was conducted following the Health Research Council of New Zealand 2021) to ensure the intervention, particularly sensory strategies, was culturally appropriate and acceptable (Engel and Schutt 2017). Regular meetings with a designated Māori cultural advisor guided manual development, informed by the Treaty of Waitangi principles of Partnership, Participation, and Protection (Hudson and Russell 2009). Partnership involved collaborating with the Māori Services Unit to align study design and sensory strategies with Māori perspectives. Participation engaged the advisor in refining the intervention while Protection safeguarded Māori participants' rights, values, and cultural norms, including culturally safe practices such as karakia (Health Research Council of NZ, 2021). The advisor highlighted the resonance of sensory modulation strategies with traditional Māori health views, such as the calming effect of music (ngā wāiata), and employed the Te Whāriki metaphor to structure the manual, integrating principles of well-being (Mana Atua), contribution (Mana Tangata), communication (Mana Reo), and emotional exploration (Mana Aotūroa) in line with CBT and sensory modulation approaches (Ministry of Education, 1996).

2.7 | The Intervention and Therapists' Training

The manualised CBT-sensory modulation intervention was named Ngā Timatanga Toa in Te Reo Māori, meaning 'to be brave'. The manual was developed by the first author based on theoretical and research literature and several years of applying sensory and CBT strategies with children in practice. The intervention was delivered over 6 weeks in six sessions, which were between 45 and 90 minutes long. Sessions 1–3 were CBT based and 4–5 focused on sensory strategies (see Table 3 for session content). The intervention was delivered to the children as well as their parents.

2.8 | Therapists Profiles

The intervention was delivered by four therapists with varying professional backgrounds, all working in child and adolescent mental health services (CAMHS). Two were recently qualified social workers, one was an experienced social worker with previous experience working with children, and one was an experienced nurse with a background in adult mental health practice, who was new to CAMHS. None of the therapists had received formal training in cognitive behavioural therapy (CBT), and all reported no prior knowledge or training in

TABLE 3 | The Intervention.

Session	Content covered
1	The child and their parent(s)/guardian(s) are introduced to the intervention. The session aims to improve their understanding of anxiety, how it affects their child's function and family life, and strategies that help manage anxiety.
2	The child is taught to identify signs of anxiety. Parent(s)/guardian(s) are also taught how to notice their child's physical signs and behaviours of anxiety. This is achieved through age-appropriate activities, stories, play, and trying out different things.
3	This is a continuation of session two and focuses on making the connections between anxious (unhelpful) thoughts and what the child feels in their body. Learning was supported through the use of activities, storytelling, and play that were tailored to the child's developmental stage, alongside exposure to varied experiences.
4	The child is taught relaxation techniques using sensory-based strategies (e.g., listening to music, getting a hand massage, doing physical activity, deep breathing exercises, using different smells for relaxation, etc.). The child then makes a sensory box with sensory-based toys to assist them with calming. The parent(s)/guardian(s) are encouraged to identify activities that calm their child when worried. The parent(s)/guardian(s) and their child are also taught how to use these activities in times of distress to help the child calm down and relax.
5	The parent(s)/guardian(s) and their child are taught ways of ensuring that calming activities are practised daily and become part of the child's daily routine.
6	A consolidation and celebration session. Summarises all the materials covered from sessions one to five and encourages the parent(s)/guardian(s) and their child to continue using the skills taught.

sensory modulation. To ensure consistency in delivery, all therapists completed 8 hours of structured training provided by the lead researcher. This was delivered over 4 weekly sessions of 2 hours each. The training programme covered the intervention manual in detail, introduced the core principles of CBT, outlined sensory modulation strategies, and provided guidance on the use of feedback-informed treatment measures. This preparatory training aimed to equip therapists with the foundational knowledge and practical skills required to implement the intervention with fidelity. Each intervention session was audio-recorded for adherence and fidelity testing.

2.9 | Ethical Approval

This study was approved by the Health and Disability Ethical Committees (HDECs) on December 15, 2020 (study number 20NTA165) and by the Auckland University of Technology Ethics Committee (AUTEC) in March 2021. Local ethics approval was granted by the Hawkes Bay Hospital Clinical Trials Committee on April 4, 2022. The study was registered with the Australian New Zealand Clinical Trials Registry (ANZCTR), and the Trial Number is ACTRN12621000368831.

3 | Results

3.1 | Effectiveness of the Intervention

Overall, the individual results of this study support a functional relationship between the Ngā Timatanga Toa programme and reductions in anxiety among children aged 4–7 years. Appendix 1 presents graphs showing overall improvements in scores from pre- to post-intervention across participants. Reports from the psychologist and feedback from parents indicated that the intervention helped reduce anxiety symptoms and behaviours of concern. Parent ratings also suggested that the programme enhanced the children's overall functioning by decreasing anxiety-related interference in their daily lives. Improvements were observed across both school and home settings following the intervention.

Overall, accounting for missing data, the intervention effects were replicated across all six participants, with each child's baseline scores changing following the intervention. The magnitude of change varied from small to significant, with gains maintained for most participants ($n = 4$) at the 1-month follow-up. Effect size calculations indicate that these changes were statistically meaningful (Refer to Appendix 1). Notably, four of the six children no longer met the criteria for an anxiety disorder at post-intervention and at 1-month follow-up. Some children showed higher scores after the intervention. These increases were linked to changes in family and social circumstances that raised anxiety levels, keeping in mind that the intervention took place during the COVID-19 period. Table 4 provides a summary of the results for all six participants.

The intervention's effect size (ES) for each participant was calculated using Busk and Serlin's (1992) $d1$, an adaptation of Cohen's d. While Cohen's (1988) benchmarks are standard for calculating effect size (d) in group designs, it is widely recognised as too conservative for Single-Case Experimental Designs (SCED) (Pustejovsky and Ferron 2017; Robey and Beeson 2006). In the absence of established SCED benchmarks specifically for Cognitive Behavioural Therapy (CBT), the benchmarks proposed by Robey and Beeson (2006) were used as a proxy to reflect the higher effect-size expectations inherent in single-subject methodology.

Following the guidelines for single-case designs proposed by Robey and Beeson (2006), ES ($d1$) values were interpreted as small (4.0), medium (7.0), and large (10.1).

$d1 < 4.0$ is very small

$4.0 <= d1 < 7.0$ is small

$7.0 <= d1 < 10.1$ is medium

$d1 >= 10.1$ is large

Effect sizes for all the participants ranged from medium to large, corroborating parent reports of intervention effectiveness, and were evident in the improvement trend across the individual participants' results. Parents also provided feedback regarding the intervention and noted improvements in their children following it. The intervention feedback is summarised in Table 5.

3.2 | Acceptability and Practicality of the Intervention

The findings indicate that the intervention was acceptable to five of the six participating mothers and all of the children. Five mothers provided strong positive feedback and stated they would recommend the programme to other parents. One mother noted that the material seemed too advanced for younger children but felt it would be suitable for older children.

Therapists reported that the intervention was both helpful and practical to deliver within New Zealand settings. Their acceptance was supported by moderate to high adherence scores in the fidelity review, with a Cohen's Kappa inter-rater agreement of 0.55. Therapists highlighted the value of the sensory components, noting that the way the material was presented helped children understand the concepts of sensory modulation. They also reported that the sensory tools, such as toys, were effective in assisting children to manage distress.

The CBT components were also considered beneficial, as they helped identify the cognitive contributors to the children's anxiety, allowing therapists to address underlying issues for some children. According to the therapists, children were highly engaged during sessions, enjoying the content—particularly the sensory modulation strategies and the process of creating personalised sensory boxes. Personalising the sensory boxes enhanced engagement by including toys that appealed to each child, reflecting a child-friendly approach.

Therapists also observed strong parental engagement throughout the sessions. Parents reported that they found both components of the intervention valuable. The CBT component

TABLE 4 | Participant results.

Participant	Period	Diagnosis criteria met	CALIS-PV below the cut-off	CALIS-P below the cut-off	CALIS-C below the cut-off	Hypothesis 1 and 2 supported
Esther	On Entry	Yes	No	N/A	N/A	Yes
	Baseline	Yes	No	N/A	N/A	
	PI	No	Yes	N/A	N/A	
	FU	No	Yes	N/A	N/A	
Andy	On Entry	Yes	No	N/A	N/A	Yes
	Baseline	Yes	No	N/A	N/A	
	PI	Yes	No	N/A	N/A	
	FU	Not done	Yes	N/A	N/A	
Collin	On Entry	Yes	N/A	No	No	Yes
	Baseline	Yes	N/A	No	No	
	PI	No	N/A	Yes	No	
	FU	No	N/A	Yes	Yes	
Ben	On Entry	Yes	N/A	No	No	Yes
	Baseline	Yes	N/A	No	No	
	PI	No	N/A	Yes	No	
	FU	No	N/A	Yes	Yes	
Dorothy	On Entry	Yes	N/A	No	No	Partially
	Baseline	Yes	N/A	No	No	
	PI	Yes	N/A	Yes	Not done	
	FU	Yes	N/A	Yes	Not done	
Fred	On Entry	Yes	N/A	No	No	Yes
	Baseline	Yes	N/A	No	No	
	PI	No	N/A	Yes	No	
	FU	No	N/A	Yes	No	

Note: Key: PI, post-intervention; FU, follow-up; CALIS-PV = The Child Anxiety Life Interference Scale (Pre-School-Version), CALIS-P = The Child Anxiety Life Interference Scale (Parent version), CALIS-C = The Child Anxiety Life Interference Scale (Child version). N/A = measure not relevant for the child's age. Below the cut-off = below the threshold for clinically significant anxiety interference.

helped them better understand their own anxiety as well as their child's, while the sensory modulation strategies provided practical tools to support their child when distressed.

4 | Discussion

This study investigated the effectiveness, acceptability, and practicality of the Ngā Timatanga Toa intervention, a six-session programme combining CBT and sensory modulation for young children experiencing anxiety. The findings offer preliminary evidence that the programme can reduce anxiety symptoms, enhance functioning, and be considered both acceptable and feasible for delivery in New Zealand CAMHS. Graphical representations indicate a consistent pattern of improvement among participants, with post-intervention scores showing notable increases compared to pre-intervention scores. Effect size analyses further support these findings, demonstrating meaningful changes in participants' responses (see Appendix 1 for detailed graphs, outcome measures, and effect size data).

Following the intervention, four of the six children (67%) no longer met criteria for an anxiety disorder, while the remaining two participants showed substantial improvements in both anxiety symptoms and overall functioning. These outcomes align with previous research on CBT-based interventions for childhood anxiety (Anticich et al. 2013; Barrett et al. 2015; Bayer et al. 2017; Breinholst et al. 2012; Cobham 2012), which similarly reported reductions in anxiety and enhancements in functioning post-intervention and at follow-up. In these studies, reductions in anxiety ranged from 54% of participants

TABLE 5 | Summary of parent-reported outcomes following CBT-sensory modulation intervention.

Child participant	Pre-treatment presentation (as reported by parent)	Post-treatment outcomes (as reported by parent)	Illustrative quotes
Esther	Shy, timid, emotionally dependent, with frequent tantrums, reluctant to separate from mother.	Gained confidence, improved emotional regulation, became more independent, social, and less clingy, and slept alone.	"*She became more confident... more conversational... less clingy.*"
Andy	High anxiety around separation, toilet use, avoiding water-based activities, and being sensitive to sensory input.	Better separation at school, used the toilet at school for the first time, swam, enjoyed water play, and engaged in sensory strategies.	*"The sensory strategies in sessions four and five were critical... he even went swimming."*
Collin	Severe separation anxiety, reinforced by parental responses (e.g., keeping home from school).	Reduced anxiety, more independent, better school separation, mother is more aware of her role.	*"Strategies around managing my own anxiety and supporting brave behaviour were helpful."*
Ben	Emotional meltdowns, anxiety around transitions, difficult separation, and poor social engagement.	Used sensory tools independently, calmer transitions, improved peer relationships, and better self-awareness.	*"He was excited to add more toys to his sensory box... he's easier to manage."*
Dorothy	Complex anxiety, sensory challenges, high sensitivity to noise, and limited functional outings.	Used noise-cancellation headphones to self-regulate, family managed a trip for the first time.	*"I didn't find the intervention helpful... but the headphones helped manage her anxiety."*
Fred	Difficulty vocalising trainings, high bedtime anxiety, occasional sensory distress, and transitions are hard.	More expressive, used the sensory box to sleep, improved confidence, and had residual challenges with transitions.	*"He engaged in ways I never expected... the intervention was awesome."*

immediately post-intervention to 95% at follow-up, placing the current study's 67% improvement post-intervention within a comparable range, albeit with a smaller sample size.

Differences between the current and prior studies include variations in delivery mode, number of sessions, participant age, follow-up duration, and therapist experience. Gains in previous studies were maintained over periods ranging from 4 weeks (Khanna and Kendall 2010) to 2 years in a Norwegian study of children aged 7–13 (Villabø et al. 2018). Many of these interventions were more intensive, delivered over 6–20 sessions (Fenn et al. 2013), and some included booster sessions at 1- and 3-months post-intervention (March et al. 2009; Spence et al. 2006). Additionally, many programmes were delivered by highly experienced therapists (Minde et al. 2010; Kendall et al. 2008). By comparison, the current study suggests that clinically meaningful improvements can be achieved with only six sessions, particularly for children with mild anxiety, and with therapists who have relatively limited experience. Also, considering the participants' presentations, it appears that the intervention is more effective with mild anxiety presentations compared to those with severe anxiety.

The intervention also appeared to improve children's functioning, as evidenced by reductions in anxiety-related interference and consistently high outcome rating scores. All participants showed decreases in CALIS scores once the intervention began, indicating reduced life interference and improved day-to-day functioning. Parent feedback supported these findings, noting observable improvements in their children's functioning during the intervention period. These results are consistent with Woodet al.'s. (2006) study, which demonstrated that reductions in anxiety through CBT corresponded with improvements in academic and social functioning among older children (6–13 years).

Although some follow-up data were missing, the current study showed that most children maintained gains in anxiety-related life interference at 1-month follow-up. Two participants' CALIS-P scores exhibited a downward trend during the baseline phase, which may reflect parental scoring bias due to expectations of benefit (Furukawa et al. 2014; Hawryluk and Bullock 2015) or a 'Hawthorne effect' (Blease 2019). Overall, the combination of quantitative and qualitative evidence indicates that the six-session CBT-SM intervention has the potential to reduce anxiety symptoms and improve functioning in young children, supporting the need for further evaluation.

4.1 | Acceptability and Practicality

Parental and therapist feedback indicated a strong acceptance of the intervention. Five mothers reported high satisfaction, describing the programme as helpful and recommending it to other parents. This aligns with previous studies that found parent-involved CBT programmes to be well-received (Monga et al. 2009; Van Der Mheen et al. 2019). Therapists also found the intervention acceptable and practicable, as demonstrated by

moderate-to-high fidelity scores. The relationship between acceptability and adherence to an intervention has been noted by Sekhon et al. (2017), who assert that therapists are unlikely to adhere to manualised interventions they do not perceive as helpful. The intervention's flexibility allowed therapists to tailor sessions to individual children's needs, which likely contributed to its acceptability. No participants dropped out, suggesting the intervention was both engaging and feasible for families. The six-session format was manageable, though one parent noted that some CBT concepts were challenging for younger children. This highlights the need for further developmental adaptations for preschool children.

4.2 | Therapist Adherence and Fidelity

The resulting therapist adherence score of 0.55 (Cohen's Kappa) indicates moderate therapist adherence and suggests that the intervention was delivered consistently in accordance with the protocol. Additionally, the interrater agreement score was 82%, which falls within the acceptable range for evaluating intervention fidelity ratings (Borrelli 2011). The use of audio recordings provided an objective means of assessing adherence, thereby enhancing the study's internal validity. Future research should aim to achieve higher fidelity scores by incorporating more comprehensive training and supervision for therapists.

4.3 | Strengths and Limitations of the Study

This study is the first known investigation to integrate CBT with sensory modulation specifically for childhood anxiety, contributing to the literature on early interventions. The inclusion of children aged 4–7 years is particularly important, as early intervention is critical for preventing the development of chronic anxiety disorders (Afshari, 2014; Bennett et al. 2015). The study's design, which incorporated multiple baseline measurements, multiple informants, and validated psychometric instruments (CBCL, CALIS, TRF), enhanced the reliability of the findings. Replication of the intervention across different therapists and clinical settings further supports its generalisability. Strong internal validity was demonstrated, meeting key standards for SCED methodology (Tate and Perdices 2019). Another notable strength was the active involvement of parents, who played a key role in supporting their child's therapy, consistent with research indicating that engagement improves treatment outcomes (Haine-Schlagel, Walsh 2015).

Despite these strengths, the study has several limitations. The small sample size restricts the generalisability of the findings, and the 1-month follow-up period was brief, limiting conclusions about long-term effectiveness. Future research should incorporate longer follow-up intervals, such as three, six, and twelve months. The absence of a control group makes it difficult to isolate the effects of the intervention. Conducting a larger randomised controlled trial (RCT) would provide stronger evidence for the intervention's efficacy and wider applicability. Parental bias is a potential concern, as mothers' expectations may have influenced outcome ratings (Furukawa et al. 2014). Additionally, the 8-hour therapist training may have been insufficient, particularly for practitioners unfamiliar with sensory modulation techniques. More extensive training and ongoing supervision could improve fidelity and intervention outcomes. Finally, only one teacher participated, limiting the ability to compare parent and teacher perspectives on child anxiety.

4.4 | Implications for Future Research and Practice

Future studies should explore the intervention's effectiveness using RCTs with larger samples and extended follow-ups. Investigating the role of sensory modulation as a standalone treatment for anxiety in young children could also provide valuable insights. Additionally, modifying the intervention for online delivery could improve accessibility, particularly in response to disruptions such as COVID-19. More research is needed on how therapists' experience influences treatment outcomes. Studies examining the impact of training duration, supervision quality, and therapist competence on fidelity and effectiveness would be valuable. Further investigation into the intervention's suitability for culturally diverse populations is also needed, as there was limited ethnic diversity in the sample. Given that Māori and Pacific children are overrepresented in NZ mental health statistics, incorporating culturally responsive modifications could enhance accessibility and effectiveness in New Zealand settings.

5 | Conclusion

This study offers preliminary support for the effectiveness, acceptability, and practicality of the Ngā Timatanga Toa intervention for young children experiencing anxiety. The integration of CBT with sensory modulation shows promise as a therapeutic approach. While these initial findings are encouraging, further research is required to confirm long-term efficacy, assess the sustainability of improvements, refine therapist training, and explore potential cultural adaptations. The combination of sensory modulation within a CBT framework represents a novel approach, with results indicating potential benefits for young children. Sensory modulation appeared to support children in self-regulating their anxiety, aligning with previous research demonstrating that sensory-based interventions can facilitate emotional regulation (Green and Ben-Sasson 2010). Overall, the findings suggest that combining sensory strategies with CBT may be a viable and effective treatment option for this age group.

Author Contributions

Mandie Foster and Daniel Sutton were the supervisors of the doctoral study, providing study conceptualisation, methodology, supervision, and review and editing of the writing.

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Disclosure

Tafadzwa Mavhunga: I hereby declare that no AI tools or systems were used in the conception, design, analysis, writing, or revision of this manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

Declaration

The authors declare that no AI tools or systems were used in the conception, design, analysis, writing, or revision of this manuscript. All content is the result of the authors' own intellectual work, supported only by conventional academic resources and methodologies.

Data Availability Statement

Child and Adolescent Mental Health (CAMH). The authors hereby declare that this manuscript is derived from the doctoral thesis of Tafadzwa Mavhunga, completed at the Auckland University of Technology (AUT). The thesis has been formally examined, approved, and published in the AUT institutional repository, Open Repository (available at openrepository.aut.ac.nz).

References

Abel, M. R., A. A. D'Amico, and D. R. Hirshfeld-Becker. 2025. "Cognitive-Behavioral Therapy for Anxiety in Children Age 7 Years and Younger." *Psychiatric Annals* 55, no. 4: e91–e97. https://doi.org/10.3928/00485713-20250207-03.

Afshari, A., H. T. Neshat-Doost, M. R. Maracy, M. K. Ahmady, and S. Amiri. 2014. "The Effective Comparison Between Emotion-Focused Cognitive Behavioral Group Therapy and Cognitive Behavioral Group Therapy in Children With Separation Anxiety Disorder." *Journal of Research in Medical Sciences: The Official Journal of Isfahan University of Medical Sciences* 19, no. 3: 221–227. https://pmc.ncbi.nlm.nih.gov/articles/PMC4061643/.

Ahmed, M. I., M. A. Farrell, K. Parrish, and A. Karla. 2011. "Preoperative Anxiety in Children: Risk Factors and Non-Pharmacological Management." *Middle East Journal of Anaesthesiology* 21, no. 2: 153–164. https://pubmed.ncbi.nlm.nih.gov/22435267/.

American Psychiatric Association. 2013. *Diagnostic and Statistical Manual of Mental Disorders* 5th ed. American Psychiatric Publishing.

Anticich, S. A. J., P. M. Barrett, W. Silverman, P. Lacherez, and R. Gillies. 2013. "The Prevention of Childhood Anxiety and Promotion of Resilience Among Preschool- Aged Children: A Universal School Based Trial." *Advances in School Mental Health Promotion* 6, no. 2: 93–121. https://doi.org/10.1080/1754730x.2013.784616.

Ayres, J. 1972. "Sensory Integration and Learning Disorders." *Western Psychological Services*. https://archive.org/details/sensoryintegrati00ayre.

Barrett, P. M., M. R. Dadds, and R. M. Rapee. 1996. "Family Treatment of Childhood Anxiety: A Controlled Trial." *Journal of Consulting and Clinical Psychology* 64, no. 2: 333–342. https://doi.org/10.1037/0022-006x.64.2.333.

Barrett, P., B. Fisak, and M. Cooper. 2015. "The Treatment of Anxiety in Young Children: Results of an Open Trial of the Fun FRIENDS Program." *Behaviour Change* 32, no. 4: 231–242. https://doi.org/10.1017/bec.2015.12.

Bayer, J. K., R. Beatson, L. Bretherton, H. Hiscock, M. Wake, and T. Gilbertson. 2017. "Translational Delivery of Cool Little Kids to Prevent Child Internalising Problems: Randomised Controlled Trial." *Australian & New Zealand Journal of Psychiatry* 52, no. 2: 181–191. https://doi.org/10.1177/0004867417726582.

Bayer, J. K., R. M. Rapee, H. Hiscock, O. C. Ukoumunne, C. Mihalopoulos, and S. A. Clifford. 2011. "The Cool Little Kids Randomised Controlled Trial: Population-Level Early Prevention for Anxiety Disorders." *BMC Public Health* 11, no. 11: 1–9. https://doi.org/10.1186/1471-2458-11-11.

Beck, A. T. 1970. "Cognitive Therapy, Nature and Relation to Behavior Therapy." *Behavior Therapy* 1, no. 2: 184–200. https://doi.org/10.1016/S0005-7894(70)80030-2.

Bennett, K., K. Manassis, S. Duda, A. Bagnell, G. A. Bernstein, and E. J. Garland. 2015. "Preventing Child and Adolescent Anxiety Disorders: Overview of Systematic Reviews." *Depression and Anxiety* 32, no. 12: 909–918. https://doi.org/10.1002/da.22400.

Beeson, P. M., and R. R. Robey. 2006. "Evaluating Single-Subject Treatment Research: Lessons Learned From the Aphasia Literature." *Neuropsychology Review* 16, no. 4: 161–169. https://doi.org/10.1007/s11065-006-9013-7.

Blackburn, J., B. McKenna, B. Jackson, et al. 2016. "Educating Mental Health Clinicians about Sensory Modulation to Enhance Clinical Practice in a Youth Acute Inpatient Mental Health Unit: A Feasibility Study." *Issues in Mental Health Nursing* 37, no. 7: 517–525. https://doi.org/10.1080/01612840.2016.1184361.

Borrelli, B. 2011. "The Assessment, Monitoring, and Enhancement of Treatment Fidelity in Public Health Clinical Trials." *Journal of Public Health Dentistry* 71, no. S1: 52–63. https://doi.org/10.1111/j.1752-7325.2011.00233.x.

Blease, C. 2019. "The Role of Placebos in Family Medicine: Implications of Evidence and Ethics for General Practitioners." *Australian Journal of General Practice* 48, no. 10: 700–705. https://doi.org/10.31128/ajgp-05-19-4939.

Breinholst, S., B. H. Esbjørn, M. L. Reinholdt-Dunne, and P. Stallard. 2012. "CBT for the Treatment of Child Anxiety Disorders: A Review of Why Parental Involvement Has Not Enhanced Outcomes." *Journal of Anxiety Disorders* 26, no. 3: 416–424. https://doi.org/10.1016/j.janxdis.2011.12.014.

Brewin, C. R. 1996. "Theoretical Foundations of Cognitive-Behavior Therapy for Anxiety and Depression." *Annual Review of Psychology* 47, no. 1: 33–57. https://doi.org/10.1146/annurev.psych.47.1.33.

Brown, A., T. Tse, and T. Fortune. 2018. "Defining Sensory Modulation: A Review of the Concept and a Contemporary Definition for Application by Occupational Therapists." *Scandinavian Journal of Occupational Therapy* 26, no. 7: 515–523. https://doi.org/10.1080/11038128.2018.1509370.

Busk, P. L., and R. C. Serlin. 1992. "Meta-analysis for single-case research." In *Single-case Research Design and Analysis: New Directions for Psychology and Education*, edited by In. T. R. Kratochwill and J. R. Levin, 187–212. Lawrence Erlbaum Associates.

Cameron, A., P. Burns, A. Garner, et al. 2020. "Making Sense of Multi-Sensory Environments: A Scoping Review." *International Journal of Disability, Development and Education* 67, no. 6: 630–656. https://doi.org/10.1080/1034912X.2019.1634247.

Cartwright-Hatton, S., C. Roberts, P. Chitsabesan, C. Fothergill, and R. Harrington. 2004. "Systematic Review of the Efficacy of Cognitive Behaviour Therapies for Childhood and Adolescent Anxiety Disorders." *British Journal of Clinical Psychology* 43, no. 4: 421–436. https://doi.org/10.1348/0144665042388928.

Champagne, T., and N. Stromberg. 2004. "Sensory Approaches in Inpatient Psychiatric Settings." *Journal of Psychosocial Nursing and Mental Health Services* 42, no. 9: 34–44. https://doi.org/10.3928/02793695-20040901-06.

Champagne, T. 2010. "Occupational Therapy in Special Situations, Including High-risk." In *Occupational Therapy in Mental Health: Considerations for Advanced Practice*, edited by In. M. Scheinholtz. American Occupational Therapy Association.

Champagne, T. 2011a. *Sensory Modulation & Environment: Essential Elements of Occupation* 3rd ed. Pearson Australia Group.

Champagne, T. 2011b. "The Influence of Posttraumatic Stress Disorder, Depression, and Sensory Processing Patterns on Occupational Engagement: A Case Study." *Work-A Journal of Prevention Assessment & Rehabilitation* 38, no. 1: 67–75. https://doi.org/10.3233/wor-2011-1105.

Cheng, C., G. B. Baker, and S. M. Dursun. 2019. "Use of Multisensory Stimulation Interventions in the Treatment of Major Neurocognitive Disorders." *Psychiatry and Clinical Psychopharmacology* 29, no. 4: 916–921. https://doi.org/10.1080/24750573.2019.1699738.

Chu, B., K. Marwaha, T. Sanvictores, A. O. Awosika, and D. Ayers (2024). *Physiology, Stress Reaction*. In StatPearls. StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NBK541120/.

Cobham, V. E. 2012. "Do Anxiety-Disordered Children Need to Come into the Clinic for Efficacious Treatment?" *Journal of Consulting and Clinical Psychology* 80, no. 3: 465–476. https://doi.org/10.1037/a0028205.

Cohen, J. 1988. *Statistical Power Analysis for the Behavioural Sciences* 2nd ed. Lawrence Erlbaum Associates.

Creswell, C., and P. Waite. 2016. "Recent Developments in the Treatment of Anxiety Disorders in Children and Adolescents." *Evidence Based Mental Health* 19, no. 3: 65–68. https://doi.org/10.1136/eb-2016-102353.

Creswell, C., C. Chessell, and G. Halliday. 2023. "Parent-Led Cognitive Behaviour Therapy for Child Anxiety Problems: Overcoming Challenges to Increase Access to Effective Treatment." *Behavioural and Cognitive Psychotherapy* 51: 512–532. https://doi.org/10.1017/s1352465822000546.

Creswell, C., P. Waite, and P. J. Cooper. 2014. "Assessment and Management of Anxiety Disorders in Children and Adolescents." *Archives of Disease in Childhood* 99, no. 7: 674–678. https://doi.org/10.1136/archdischild-2013-303768.

Elgar, F. J., T. K. Pförtner, I. Moor, B. De Clercq, G. W. J. M. Stevens, and C. Currie. 2015. "Socioeconomic Inequalities in Adolescent Health 2002–2010: A Time-Series Analysis of 34 Countries Participating in the Health Behaviour in School-Aged Children Study." *Lancet* 385, no. 9982: 2088–2095. https://doi.org/10.1016/s0140-6736(14)61460-4.

Engel, J. R., and K. R. Schutt. 2017. *The Practice of Research in Social Work* 4th ed. SAGE Publications.

Fenn, K., and M. Byrne. 2013. "The Key Principles of Cognitive Behavioural Therapy." *InnovAiT: Education and Inspiration for General Practice* 6, no. 9: 579–585. https://doi.org/10.1177/1755738012471029.

Finn, H., E. Warner, M. Price, and J. Spinazzola. 2018. "The Boy Who Was Hit in the Face: Somatic Regulation and Processing of Preverbal Complex Trauma." *Journal of Child & Adolescent Trauma* 11, no. 3: 277–288. https://doi.org/10.1007/s40653-017-0165-9.

Fisak, B., J. G. Guajardo, M. Verreynne, and P. M. Barrett. 2018. "The Results of a Targeted Open Trial of the Fun FRIENDS Combined With a Concurrent Parent-Based Intervention." *Mental Health & Prevention* 10: 35–41. https://doi.org/10.1016/j.mhp.2018.03.001.

Furukawa, T. A., H. Noma, D. M. Caldwell, M. Honyashiki, K. Shinohara, and H. Imai. 2014. "Waiting List May be a Nocebo Condition in Psychotherapy Trials: A Contribution From Network Meta-Analysis." *Acta Psychiatrica Scandinavica* 130, no. 3: 181–192. https://doi.org/10.1111/acps.12275.

Garber, J., S. A. Frankel, and C. G. Herrington. 2016. "Developmental Demands of Cognitive Behavioral Therapy for Depression in Children and Adolescents, Cognitive, Social, and Emotional Processes." *Annual review of clinical psychology* 12: 181–216. https://doi.org/10.1146/annurev-clinpsy-032814-112836.

Girling-Butcher, R. D., and K. R. Ronan. 2002. *Brief Cognitive Behavioural Therapy for Anxious Children: The "Coping Kiwi" Treatment Manual* 2nd ed. [Unpublished treatment manual. Massey University.

Girling-Butcher, R. D., and K. R. Ronan. 2009. "Brief Cognitive-Behavioural Therapy for Children with Anxiety Disorders: Initial Evaluation of a Program Designed for Clinic Settings." *Behaviour Change* 26, no. 1: 27–53. https://doi.org/10.1375/bech.26.1.27.

Grave, J., and J. Blissett. 2004. "Is Cognitive Behavior Therapy Developmentally Appropriate for Young Children? A Critical Review of the Evidence." *Clinical Psychology Review* 24, no. 4: 399–420. https://doi.org/10.1016/j.cpr.2004.03.002.

Green, S. A., and A. Ben-Sasson. 2010. "Anxiety Disorders and Sensory Over-Responsivity in Children with Autism Spectrum Disorders: Is There a Causal Relationship?." *Journal of Autism and Developmental Disorders* 40, no. 12: 1495–1504. https://doi.org/10.1007/s10803-010-1007-x.

Guo, S., W. Deng, H. Wang, J. Liu, X. Liu, and X. Yang. 2021. "The Efficacy of Internet-Based Cognitive Behavioural Therapy for Social Anxiety Disorder: A Systematic Review and Meta-Analysis." *Clinical Psychology & Psychotherapy* 28, no. 3: 656–668. https://doi.org/10.1002/cpp.2528.

Haine-Schlagel, R., and N. E. Walsh. 2015. "A Review of Parent Participation Engagement in Child and Family Mental Health Treatment." *Clinical Child and Family Psychology Review* 18, no. 2: 133–150. https://doi.org/10.1007/s10567-015-0182-x.

Halder, S., and A. K. Mahato. 2019. "Cognitive Behavior Therapy for Children and Adolescents: Challenges and Gaps in Practice." *Indian Journal of Psychological Medicine* 41, no. 3: 279–283. https://doi.org/10.4103/ijpsym.ijpsym_470_18.

Hansen, A. S., G. K. Telléus, C. Mohr-Jensen, and M. B. Lauritsen. 2021. "Parent-Perceived Barriers to Accessing Services for Their Child's Mental Health Problems." *Child and Adolescent Psychiatry and Mental Health* 15, no. 1: 4. https://doi.org/10.1186/s13034-021-00357-7.

Hawryluk, G., and M. R. Bullock. 2015. "Design of Acute Neuroprotection Studies." *Handbook of Clinical Neurology* 128: 761–778. https://doi.org/10.1016/b978-0-444-63521-1.00047-9.

Health and Disability Commission. 2018. "New Zealand's Mental Health and Addiction Services." *Monitoring Advocacy Report Of The Mental Health Commissioner*. https://www.hdc.org.nz/media/m2wfw5vk/mental-health-commissioners-monitoring-and-advocacy-report-2018.pdf.

Health Research Council of New Zealand. (2021). HRC Research Ethics Guidelines. https://www.hrc.govt.nz/sites/default/files/2021-04/HRC%20Research%20Ethics%20Guidelines-%20April%202021_1.pdf.

Hirshfeld-Becker, D. R., A. Henin, S. J. Rapoport, T. E. Wilens, and A. S. Carter. 2019. "Very Early Family-Based Intervention for Anxiety: Two Case Studies With Toddlers." *General Psychiatry* 32, no. 6: e100156. https://doi.org/10.1136/gpsych-2019-100156.

Hirshfeld-Becker, D. R., B. Masek, A. Henin, L. R. Blakely, R. A. Pollock-Wurman, and J. McQuade. 2010. "Cognitive Behavioral Therapy for 4- to 7-year-old Children With Anxiety Disorders: A Randomized Clinical Trial." *Journal of Consulting and Clinical Psychology* 78, no. 4: 498–510. https://doi.org/10.1037/a0019055.

Hofmann, S. G., A. Asnaani, I. J. J. Vonk, A. T. Sawyer, and A. Fang. 2012. "The Efficacy of Cognitive Behavioral Therapy, A Review of Meta-Analyses." *Cognitive Therapy and Research* 36, no. 5: 427–440. https://doi.org/10.1016/b978-0-12-800951-2.00004-2.

Hudson, M. L., and K. Russell. 2009. "The Treaty of Waitangi and Research Ethics in Aotearoa." *Journal of bioethical inquiry* 6, no. 1: 61–68. https://doi.org/10.1007/s11673-008-9127-0.

James, A. C., T. Reardon, A. Soler, G. James, and C. Creswell. 2020. "Cognitive Behavioural Therapy for Anxiety Disorders in Children and Adolescents." *Cochrane Database of Systematic Reviews* 11, no. 11: CD013162. https://doi.org/10.1002/14651858.CD013162.pub2.

Johnston, L. 2020. "Helping Children Succeed in School: A Guide to Special Education Services." In *Clinician's Toolkit for Children's Behavioral Health*, edited by In. M. Knox, 125–142. Academic Press. https://doi.org/10.1016/B978-0128160244-00006-1.

Kandlur, N. R., A. C. Fernandes, S. R. Gerard, S. Rajiv, and S. Quadros. 2023. "Sensory Modulation Interventions for Adults With Mental Illness: A Scoping Review." *Hong Kong Journal of Occupational Therapy* 36, no. 2: 57–68. https://doi.org/10.1177/15691861231204896.

Kendall, P. C., J. L. Hudson, E. Gosch, E. Flannery-Schroeder, and C. Suveg. 2008. "Cognitive-Behavioral Therapy for Anxiety Disordered Youth: A Randomized Clinical Trial Evaluating Child and Family Modalities." *Journal of Consulting and Clinical Psychology* 76, no. 2: 282–297. https://doi.org/10.1037/0022-006x.76.2.282.

Khanna, M. S., and P. C. Kendall. 2010. "Computer-Assisted Cognitive Behavioral Therapy for Child Anxiety: Results of a Randomized Clinical Trial." *Journal of Consulting and Clinical Psychology* 78, no. 5: 737–745. https://doi.org/10.1037/a0019739.

Krasny-Pacini, A., and J. Evans. 2018. "Single-Case Experimental Designs to Assess Intervention Effectiveness in Rehabilitation: A Practical Guide." *Annals of Physical and Rehabilitation Medicine* 61, no. 3: 164–179. https://doi.org/10.1016/j.rehab.2017.12.002.

MacLennan, K., T. Rossow, and T. Tavassoli. 2021. "The Relationship Between Sensory Reactivity, Intolerance of Uncertainty and Anxiety Subtypes in Preschool-Age Autistic Children." *Autism* 25, no. 8: 2305–2316. https://doi.org/10.1177/13623613211016110.

Manicavasagar, V., and D. Silove. 2020. *Separation Anxiety Disorder in Adults: Clinical Features, Diagnostic Dilemmas and Treatment Guidelines*. Academic Press. https://doi.org/10.1016/C2016-0-01828-4.

March, S., S. H. Spence, and C. L. Donovan. 2009. "The Efficacy of an Internet-Based Cognitive-Behavioral Therapy Intervention for Child Anxiety Disorders." *Journal of Pediatric Psychology* 34, no. 5: 474–487. https://doi.org/10.1093/jpepsy/jsn099.

McCarty, R. 2016. "The Fight-or-Flight Response: A Cornerstone of Stress Research." In *Stress: Concepts, Cognition, Emotion, and Behavior*, edited by G. Fink, 33–37. Academic Press. https://doi.org/10.1016/B978-0-12-800951-2.00004-2.

McMahon, K., D. Anand, M. Morris-Jones, and M. Z. Rosenthal. 2019. "A Path From Childhood Sensory Processing Disorder to Anxiety Disorders: The Mediating Role of Emotion Dysregulation and Adult Sensory Processing Disorder Symptoms." *Frontiers in Integrative Neuroscience* 13: 22. https://doi.org/10.3389/fnint.2019.00022.

Mendelsohn, A., A. Greenberger, and R. D. Friedberg. 2024. "Impact of the COVID-19 Pandemic on Pediatric Anxiety and Depression: Prevalence Data, Theoretical Synthesis, and Clinical Implications." *Exploratory Research and Hypothesis in Medicine* 9, no. 4: 328–337. https://doi.org/10.14218/erhm.2024.00004.

Miller, L. J., J. E. Reisman, D. N. McIntosh, and J. Simon. 2001. "An Ecological Model of Sensory Modulation: Performance of Children With Fragile X Syndrome, Autistic Disorder, Attention-deficit/Hyperactivity Disorder, and Sensory Modulation Dysfunction." In *Understanding the Nature of Sensory Integration With Diverse Populations*, edited by In. S. Smith-Roley, E. I. Blanche, and R. C. Schaaf, 57–88. Therapy Skill Builders.

Minde, K., J. Roy, R. Bezonsky, and A. Hashemi. 2010. "The Effectiveness of CBT in 3-7 Year Old Anxious Children: Preliminary Data." *Journal of the Canadian Academy of Child and Adolescent Psychiatry = Journal de l'Académie Canadienne de Psychiatrie de l'enfant et de l'adolescent* 19, no. 2: 109–115. https://pmc.ncbi.nlm.nih.gov/articles/PMC2868557/.

Monga, S., A. Young, and M. Owens. 2009. "Evaluating a Cognitive Behavioral Therapy Group Program for Anxious Five to Seven Year Old Children: A Pilot Study." *Depression and Anxiety* 26, no. 3: 243–250. https://doi.org/10.1002/da.20551.

Moore, K. 2016. *Following the Evidence: Sensory Approaches in Mental Health [Unpublished professional paper]*. https://www.sensoryconnectionprogram.com/pdf/follow_the_evidence.pdf.

Neufeld, S. A. S., V. J. Dunn, P. B. Jones, T. J. Croudace, and I. M. Goodyer. 2017. "Reduction in Adolescent Depression After Contact With Mental Health Services: A Longitudinal Cohort Study in the UK." *Lancet Psychiatry* 4, no. 2: 120–127. https://doi.org/10.1016/s2215-0366(17)30002-0.

Phelan, J. C., B. G. Link, and P. Tehranifar. 2010. "Social Conditions as Fundamental Causes of Health Inequalities: Theory, Evidence, and Policy Implications." *Journal of Health and Social Behavior* 51, no. 1: S28–S40. https://doi.org/10.1177/0022146510383498.

Piaget, J. 1962. "The Stages of the Intellectual Development of the Child." *Bulletin of the Menninger Clinic* 26: 120–128. https://pubmed.ncbi.nlm.nih.gov/14486280/.

Porges, S. W. 2009. "The Polyvagal Theory: New Insights into Adaptive Reactions of the Autonomic Nervous System." *Cleveland Clinic Journal of Medicine* 76, no. 4 Suppl. 2: S86–S90. https://doi.org/10.3949/ccjm.76.s2.17.

Purvis, K. B., L. B. McKenzie, D. R. Cross, and E. B. Razuri. 2013. "A Spontaneous Emergence of Attachment Behavior in At-Risk Children and a Correlation With Sensory Deficits." *Journal of Child and Adolescent Psychiatric Nursing* 26, no. 3: 165–172. https://doi.org/10.1111/jcap.12041.

Pustejovsky, J. E., and J. M. Ferron. 2017. "Research Synthesis and Meta-Analysis of Single-Case Designs." In *Handbook of Special Education*, edited by In. J. M. Kauffman, D. P. Hallahan, and P. C. Pullen, 2nd ed., 168–186. Routledge. https://doi.org/10.4324/9781315517698-15.

Rapee, R. M., H. J. Lyneham, C. A. Schniering, V. M. Wuthrich, M. A. Abbott, and J. L. Hudson. 2006. *The Cool Kids Child and Adolescent Anxiety Program Therapist Manual*. Centre for Emotional Health, Macquarie University.

Reiss, F., A. K. Meyrose, C. Otto, T. Lampert, F. Klasen, and U. Ravens-Sieberer. 2019. "Socioeconomic Status, Stressful Life Situations and Mental Health Problems in Children and Adolescents: Results of the German BELLA Cohort-Study." *PLoS One* 14, no. 3: e0213700. https://doi.org/10.1371/journal.pone.0213700.

Reynolds, K., R. Chimoriya, N. Chandio, D. Tracey, A. Pradhan, and P. Fahey. 2023. "Effectiveness of Sensory Adaptive Dental Environments to Reduce Psychophysiology Responses of Dental Anxiety and Support Positive Behaviours in Children and Young Adults With Intellectual and Developmental Disabilities: A Systematic Review and Meta-Analyses." *BMC Oral Health* 23, no. 1: Article no. 769. https://doi.org/10.1186/s12903-023-03445-6.

Ryan, K., S. J. Lane, and D. Powers. 2017. "A Multidisciplinary Model for Treating Complex Trauma in Early Childhood." *International Journal of Play Therapy* 26, no. 2: 111–123. https://doi.org/10.1037/pla0000044.

Sekhon, M., M. Cartwright, and J. J. Francis. 2017. "Acceptability of Healthcare Interventions: An Overview of Reviews and Development of a Theoretical Framework." *BMC Health Services Research* 17, no. 1: 88. https://doi.org/10.1186/s12913-017-2031-8.

Seligman, L. D., and T. H. Ollendick. 2011. "Cognitive Behavioral Therapy for Anxiety Disorders in Youth." *Child and Adolescent Psychiatric Clinics of North America* 20, no. 2: 217–238. https://doi.org/10.1016/j.chc.2011.01.003.

Sigurvinsdóttir, A. L., K. B. Jensínudóttir, K. D. Baldvinsdóttir, O. Smárason, and G. Skarphedinsson. 2019. "Effectiveness of Cognitive Behavioral Therapy (CBT) for Child and Adolescent Anxiety Disorders

Across Different CBT Modalities and Comparisons: A Systematic Review and Meta-Analysis." *Nordic Journal of Psychiatry* 74, no. 3: 168–180. https://doi.org/10.1080/08039488.2019.1686653.

Spence, S. H., J. M. Holmes, S. March, and O. V. Lipp. 2006. "The Feasibility and Outcome of Clinic Plus Internet Delivery of Cognitive-Behavior Therapy for Childhood Anxiety." *Journal of Consulting and Clinical Psychology* 74, no. 3: 614–621. https://doi.org/10.1037/0022-006x.74.3.614.

Steele, W., and C. Kuban. 2013. *Working With Grieving and Traumatized Children and Adolescents: Discovering What Matters Most Through Evidence-Based, Sensory Interventions*. John Wiley & Sons.

Sutton, D., M. Wilson, K. Van Kessel, and J. Vanderpyl. 2013. "Optimizing Arousal to Manage Aggression: A Pilot Study of Sensory Modulation." *International Journal of Mental Health Nursing* 22: 500–511. https://doi.org/10.1111/inm.12010.

Tate, R. L., and M. Perdices. 2019. "Single-Case Experimental Designs for Clinical Research and Neurorehabilitation Settings." In *Planning, Conduct, Analysis and Reporting*. Taylor & Francis. https://doi.org/10.4324/9780429488184.

Van Der Mheen, M., J. S. Legerstee, G. C. Dieleman, M. H. J. Hillegers, and E. M. W. J. Utens. 2019. "Cognitive Behavioural Therapy for Anxiety Disorders in Young Children: A Dutch Open Trial of the Fun FRIENDS Program." *Behaviour Change* 37, no. 1: 1–12. https://doi.org/10.1017/bec.2019.16.

Van Steensel, F. J. A., and S. M. Bögels. 2015. "CBT for Anxiety Disorders in Children With and Without Autism Spectrum Disorders." *Journal of Consulting and Clinical Psychology* 83, no. 3: 512–523. https://doi.org/10.1037/a0039108.

Villabø, M. A., M. Narayanan, S. N. Compton, P. C. Kendall, and S. P. Neumer. 2018. "Cognitive–Behavioral Therapy for Youth Anxiety: An Effectiveness Evaluation in Community Practice." *Journal of Consulting and Clinical Psychology* 86, no. 9: 751–764. https://doi.org/10.1037/ccp0000326.

Wainberg, M. L., P. Scorza, J. M. Shultz, L. Helpman, J. J. Mootz, and K. A. Johnson. 2017. "Challenges and Opportunities in Global Mental Health: A Research-To-Practice Perspective." *Current Psychiatry Reports* 19, no. 5: 28. https://doi.org/10.1007/s11920-017-0780-z.

Whāraurau. 2021. *2020 Stocktake of Infant, Child and Adolescent Mental Health and Alcohol and Other Drug Services in New Zealand*. Whāraurau, The University of Auckland. https://ndhadeliver.natlib.govt.nz/delivery/DeliveryManagerServlet?dps_pid=IE80568942.

Wood, J. J., and B. D. McLeod. 2008. *Child Anxiety Disorders: A Family-based Treatment Manual for Practitioners*. W. W. Norton & Company.

Wood, J. J., J. C. Piancentini, M. Southam-Gerow, B. C. Chu, and M. Sigman. 2006. "Family Cognitive Behavioral Therapy for Child Anxiety Disorders." *Journal of the American Academy of Child Adolescent Psychiatry* 45, no. 3: 314–321. https://doi.org/10.1097/01.chi.0000196425.88341.b0.

Supporting Information

Additional supporting information can be found online in the Supporting Information section.

Supporting File: jcap70055-sup-0001-Supplimentary_information_052026.docx.