

# Effects of cognitive-behavioural therapy on anxiety for children with high-functioning autistic spectrum disorders

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## ABSTRACT

**Introduction:** Children with autistic spectrum disorders (ASD) often exhibit one or more comorbid disorders, including anxiety, disruptive behaviour, mental retardation, and depression. Various studies have documented the effectiveness of cognitive-behavioural therapy (CBT) in treating children with anxiety. Although studies have indicated a high prevalence of anxiety in individuals with ASD, there is a lack of systematic studies substantiating the effectiveness of cognitive-behavioural interventions among children with high-functioning autism.

**Methods:** This pilot study investigated the effects of a 16-session CBT programme on six high-functioning children diagnosed with ASD (mean age 11.50 years, standard deviation 0.84 years). These children were diagnosed with ASD or Asperger's syndrome by the DSM-IV criteria. Measures on levels of child's anxiety, parental and teacher stress were administered at pre- and post-treatment.

**Results:** Children showed lower levels of anxiety at post-treatment. Parents and teachers also reported lower levels of stress following the CBT programme.

**Conclusion:** Findings from the present study provided some evidence of the effects of CBT for high-functioning autistic children in reducing anxiety, parental and teacher stress. Interpretation of the findings, recommendations for future research and implications of the present study are presented.

**Keywords:** anxiety, autistic spectrum disorders, cognitive-behavioural therapy, high-functioning autism, stress

*Singapore Med J 2008;49(3):215-220*

## INTRODUCTION

Children with autistic spectrum disorders (ASD) often demonstrate difficulties in interacting with others; they often engage in stereotypic, repetitive types of behaviour and may sometimes have obsessive interest patterns, as well as severe language and cognitive impairments.<sup>(1,2)</sup> Very often, the prognosis for children with this disorder is generally poor, resulting in significant lifelong disability.<sup>(3)</sup> Children with ASD often exhibit one or more comorbid disorders, including anxiety, disruptive behaviour, mental retardation, and depression. In recent years, there is a growing body of research on anxiety in children with ASD. For example, children with high-functioning autism (HFA) were found to score higher on measures of anxiety than children with specific learning impairments and normal developing children.<sup>(4)</sup> In another study on adolescents diagnosed with conduct disorder, and those diagnosed with HFA or Asperger's Syndrome, indicated that the latter had significantly higher levels of anxiety than those with conduct disorders.<sup>(5)</sup>

The development of anxiety among children with ASD may be related to their cognitive impairment.<sup>(6,7)</sup> For example, children with ASD may have executive dysfunction and lack the cognitive flexibility to generate strategies to adapt to varying circumstances.<sup>(8)</sup> As a result, they may experience distress over trivial changes in the environment. Children with ASD may also have difficulties processing information in a coherent fashion, due to their inability to integrate information into a meaningful whole, a difficulty termed "weak central coherence".<sup>(8)</sup> This information-processing style is found to be similar to non-ASD anxious children, whereby they selectively attend to threatening cues resulting in the misinterpretation of ambiguous situations as threatening, because of the failure to view these situations from the global perspective.<sup>(9,10)</sup> Collectively, these complicated cognitive deficits may cause a variety of communication and social difficulties, causing children with ASD to experience severe difficulties in social relationships, which in turn, may lead to the development of anxiety.<sup>(11,12)</sup> As such, children with ASD require help in broadening

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their social repertoire of emotions and social cognition.

Parents of children with ASD are at increased risk of experiencing high levels of stress, due to the nature of the disorder and the maladaptive behaviours that these ASD children exhibit.<sup>(13)</sup> Studies have shown that parents of children with developmental delays, including ASDs, experience significantly higher levels of stress, than parents of children without delays.<sup>(14,15)</sup> Coupled with comorbid conditions, such as anxiety, parents may experience further marked distress.<sup>(16)</sup> Hence, it is perhaps unsurprising that high levels of stress are found in parents of children with ASD.<sup>(17)</sup> Similar to parents, teachers who interact with children with ASD are also exposed to high levels of stress. A recent study found that teacher burnout is associated with behaviour problems in children with development difficulties, including some children with ASD.<sup>(18)</sup> However, literature on teacher stress in relation to children with ASD is relatively sparse.<sup>(19)</sup> Current available data with general educators indicated that between 20% and 40% report teaching to be highly stressful.<sup>(19)</sup> As such, it is not surprising if the prevalence of teachers' stress for educators of children with ASD is comparable to (if not more than) those of general educators.

Various studies have documented the effectiveness of cognitive-behavioural therapy (CBT) in treating anxiety symptoms among non-ASD children and their families.<sup>(20-23)</sup> CBT addresses the cognitive deficiency and cognitive distortions that cause a variety of communication and social difficulties, which may lead to feelings of anxiety. CBT attempts to help the individual identify and alter these faulty thought patterns to effect a constructive change in behaviour and emotion. Through CBT, individuals are provided with procedures to modify their thoughts and beliefs, as well as requisite skills (e.g. problem-solving skills) to interact with others effectively and appropriately, thereby promoting self-regulation.<sup>(24)</sup>

Although studies have indicated a high prevalence of anxiety in individuals with ASD, ranging from 13% to 35%,<sup>(4-6,25,26)</sup> there is a lack of systematic studies substantiating the effectiveness of cognitive-behavioural interventions among children with HFA. Previous research findings have indicated that ASD children may not be suitable for CBT, due to the earlier findings that most ASD children have difficulties in reading the thoughts, intent, and emotions of others, and so lack the ability to take another person's perspective.<sup>(27)</sup> This difficulty has been termed lack of a "theory of mind".<sup>(28)</sup> However, there are also literature reviews that highlighted the capability of HFA children to identify and read the thoughts, intent, and emotions of others.<sup>(29,30)</sup> With these new findings that HFA children can be engaged in these cognitive tasks, CBT seems to be a potential treatment for treating anxiety for the ASD population.<sup>(16,31)</sup>

The purpose of this pilot study is to investigate the efficacy of a manualised group treatment programme for use with high-functioning children with ASD in Singapore. A specially-tailored CBT treatment programme for children with ASD is needed, because these children may have different treatment needs from children without ASD. Our primary hypothesis is that high-functioning children with ASD in the experimental group will demonstrate greater reductions in their feelings of anxiety following the CBT programme. In addition, it is also expected that parents and teachers of these children would show significant reductions in their level of stress at posttreatment.

## METHODS

This pilot study used a pre-post test design to evaluate changes in the child's anxiety, parental stress, and teacher stress as a result of the CBT programme. This was the preliminary study prior to a larger study on a randomised clinical trial of a manualised group CBT intervention for children with HFA. The CBT programme consisted of 16 90-minute sessions conducted in a small group of three children. Standardised measures were collected at pretreatment (T1) and at posttreatment (T2; immediately upon completion of the 16-session programme) from the children, parents, and teachers. The pilot study was approved by the Institute of Mental Health's Clinical Research Committee and the National Healthcare Group's Domain Specific Review Board. Participation in the study was strictly voluntary, and only children with parental consent were allowed to participate in the study. All responses obtained were kept confidential.

Participants for this pilot study were recruited from one of the special education schools in Singapore. These six children were aged 9–13 (mean age 11.50; standard deviation 0.84) years, with full scale IQ of 80 and above, as measured by the WISC-III.<sup>(32)</sup> They were also diagnosed with autism or Asperger's syndrome, based on the DSM-IV criteria by their psychiatrists. These children were also found to have issues related to anxiety, as established by their school psychologists. The manualised group CBT treatment programme consisted of 16 90-minute weekly sessions. It was delivered in the context of small groups consisting of three children (of similar age range) in each group. Each group was conducted by two therapists, who hold postgraduate degrees in psychology and are experienced with working with children with ASD. They were also assisted by collaborators involved in the study. The CBT treatment programme combined both cognitive and behavioural techniques to teach children problem-solving skills and relaxation procedures in dealing with social situations. Within the CBT sessions, role-plays, modelling, behavioural rehearsal, and group discussion

were used to teach the various skills.

The CBT programme used in the study was adapted from existing CBT treatments for anxiety in neurotypical developing children, as well as in autistic children.<sup>(22,23,33)</sup> Adaptations to the CBT programme were made by incorporating strategies that have been found to be effective for children with ASD, such as visual cues and social stories.<sup>(34)</sup> The CBT programme consists of three main sections. The first part (sessions one to three) focused on the understanding of feelings in oneself and others. Children were taught to understand and identify different types of emotions (with emphasis on anxiety), based on the physiological reactions, thoughts, behaviour, and speech. The second part of the programme (sessions four to eight) focused on anxiety management techniques. Children were taught relaxation procedures, using physical activities, breathing exercises, and positive thoughts, among others. The third part of the programme (sessions nine to 15) focused on problem-solving strategies, based on the STAR procedure. STAR is the acronym for **STOP** (to calm down by using the tools in the toolbox), **THINK** (think of possible solutions to the problem), **ACT** (putting a plan into action), and **REFLECT** (to evaluate the outcome of the selected plan).

All measures used in the pilot study have been extensively validated and researched, and have acceptable psychometric properties. The child as an informant provided responses using the Spence Child Anxiety Scale—Child (SCAS-C).<sup>(35)</sup> The SCAS-C consists of 38 items that measure children's feelings of anxiety on six subscales: generalised anxiety disorder (GAD), obsessive-compulsive disorder (OCD), specific phobia (SP), panic and agoraphobia (PA), separation anxiety (SA), and social anxiety (SA). Participants were asked to rate the description of items on a four-point Likert scale (i.e. never, sometimes, often, or always).

The parent as an informant provided responses using the Spence Child Anxiety Scale—Parent (SCAS-P).<sup>(36)</sup> The SCAS-P consists of 39 items that measure children's feelings of anxiety on six subscales: GAD, OCD, SP, PA, SA, and SA. Parents were asked to rate the description of items on a four-point Likert scale. The parent also provided responses using the parenting stress index (PSI).<sup>(37)</sup> The PSI is a 101-item questionnaire that identifies stress within the parent-child relationship for parents of children aged between one month and 12 years old. The PSI consists of three domains: parent domain (54 items), child domain (47 items) and an optional life-stress domain (12 items). Parents were asked to rate the description of the items on a five-point Likert scale (i.e. strongly disagree, disagree, not sure, agree, strongly agree).

The teacher, as an informant, provided responses using the Asian Children Anxiety Scale—Caregiver

Version (ACAS).<sup>(38)</sup> The ACAS is a 20-item localised questionnaire, that assesses the level of children's anxiety on four subscales: bodily symptoms and arousal, affective manifestation, over-concern with losing face, and over-concern with authority. Teachers were asked to rate the description of the items on a five-point Likert scale. The teacher also provided responses using the Index of Teaching Stress (ITS).<sup>(12)</sup> The ITS is a 90-item questionnaire that assesses the level of teacher distress in relation to a specific child in his or her class. The ITS consists of both the Student Characteristics and Teacher Characteristics Domains. The Student Characteristics Domain (47 items) is associated with students who display behaviours that are frustrating and stressful for the teachers, and in turn, cause difficulties for the teachers to fulfil their teaching roles. The Teacher Characteristics Domain (43 items) explores the teacher's perception of how a particular student influences him or her and the teaching process. This domain assesses areas related to a teacher's need for support, loss of satisfaction from teaching, and frustration with parents, and the disruption of the teaching process. Teachers were asked to rate the description of items on a five-point Likert scale.

## RESULTS

A series of paired sample *t*-tests were used to compare parent-ratings of child anxiety across time (T1 pretreatment; T2 posttreatment). These analyses were conducted for the total scale and subscales. Children reported a reduction in their level of anxiety, reflected by scores on the SCAS-C (mean T1 = 40.63 and mean T2 = 33.26;  $t(5) = 1.88$ ;  $p = 0.12$ ;  $d = 0.36$ ). Although parents reported that their child had higher levels of anxiety on the SCAS-P at posttreatment (mean T1 = 20.08 and mean T2 = 21.95;  $t(5) = -0.56$ ;  $p = 0.60$ ,  $d = -0.23$ ), it was worthwhile to note that the reductions in anxiety were related to socially phobic (mean T1 = 5.45 and mean T2 = 4.60;  $t(5) = 0.50$ ;  $p = 0.64$ ;  $d = 0.24$ ) and obsessive-compulsive tendencies (mean T1 = 4.13 and mean T2 = 3.20;  $t(5) = 1.44$ ;  $p = 0.20$ ;  $d = 0.46$ ). Teachers also reported a reduction in the children's anxiety level as measured by the ACAS (mean T1 = 28.00 and mean T2 = 25.60;  $t(5) = 0.55$ ;  $p = 0.61$ ;  $d = 0.28$ ).

All these differences, however, did not reach statistical significance due to the small sample size. The summary of the change in children's anxiety based on parent- and teacher-ratings from pre- to posttreatment is shown in Table I. Similar paired sample *t*-tests were also used to compare parent- and teacher-ratings of personal stress across time (T1 pretreatment; T2 post-treatment). These analyses were conducted for the total scale and subscales. At posttreatment, parents reported significantly lower levels of stress as measured by the PSI (mean T1 = 277.40 and

**Table I. Summary of the change in children's anxiety.**

	Mean T1 ± SD (n = 6)	Mean T2 ± SD (n = 6)	t(5)	p-value
SCAS-C	40.63 ± 20.75	33.27 ± 20.29	1.88	0.12
SCAS-P	20.08 ± 6.94	21.95 ± 9.12	-0.56	0.60
Social anxiety	5.45 ± 3.95	4.60 ± 3.20	0.50	0.64
Obsessive-compulsive behaviour	4.13 ± 1.97	3.20 ± 2.04	1.44	0.21
ACAS	28.00 ± 9.27	25.60 ± 7.86	0.55	0.61

SCAS-C: Spence children anxiety scale—child version; SCAS-P: Spence children anxiety scale—parent version; ACAS: Asian children anxiety scale; T1: pretreatment; T2: posttreatment; SD: standard deviation.

**Table II. Summary of the change in parental and teacher stress.**

	Mean T1 ± SD (n = 6)	Mean T2 ± SD (n = 6)	t(5)	p-value
PSI	277.40 ± 56.78	247.40 ± 55.77	3.47	0.02*
Child domain	116.00 ± 30.00	99.00 ± 27.55	5.63	0.00**
Parent domain	161.40 ± 33.40	148.40 ± 31.63	1.59	0.17
ITS	101.75 ± 13.67	99.90 ± 9.73	0.66	0.54
Student characteristics domain	55.15 ± 9.47	54.65 ± 8.17	0.19	0.86
Teacher characteristics domain	46.60 ± 5.75	45.25 ± 2.56	0.91	0.41

PSI: parenting stress index; ITS: index of teaching stress; T1: pretreatment; T2: posttreatment; \*p < 0.05, \*\* p < 0.001.

mean T2 = 247.40; t(5) = 3.47; p = 0.02; d = 0.53). It was also interesting to note that parents reported a significant improvement on stress related to the Child Domain (mean T1 = 116.00 and mean T2 = 99.00; t(5) = 5.63; p = 0.00, d = 0.59). While findings on these significant differences were noteworthy, it should be interpreted with caution due to the small sample size. Teachers, on the other hand, reported non-significant reduction in their personal stress level on the ITS (mean T1 = 101.75 and mean T2 = 99.90; t(5) = 0.66; p = 0.54; d = 0.16). Both the Student Characteristics (mean T1 = 55.15 and mean T2 = 54.65; t(5) = 0.19; p = 0.86; d = 0.06) and Teacher Characteristics (mean T2 = 46.60 and mean T2 = 45.25; t(5) = 0.91; p = 0.41; d = 0.30) Domains indicated non-significant improvements as well. The summary of the change in parental stress and teacher stress from pre- to posttreatment is presented in Table II.

## DISCUSSION

Findings from the pilot study indicated significant reductions in parental stress following the CBT treatment programme. In addition, there were also non-significant improvements in teacher stress and in children's levels of anxiety, as measured by self- and teacher-reports. There appears to be a consistent pattern of results across data from child-, parent- and teacher-reports and this provides preliminary support for the efficacy of the group CBT treatment extended to both the children's home and school settings.

An interesting finding from the pilot study was the

consistent trend toward the reduction in social phobia and obsessive-compulsive tendencies, as measured by both child and parent reports. Previous literature has suggested that higher levels of obsessive-compulsive tendencies (i.e. repetitive, ritualistic behaviours) may be a reflection of the general characteristics of a child with Asperger's syndrome, as a means of reducing anxiety or as a consequence of experiencing anxiety.<sup>(39,40)</sup> Children with high-functioning autism are often in distress when encountering social situations, and these prevent them from establishing meaningful, social relationships. As a result of this social phobia, many ASD children approach the social world without much support from the people around them.<sup>(41)</sup> Improvements in these two areas of functioning is an issue of great interest to researchers and clinicians alike, because it will improve our knowledge regarding the type of intervention which may be more effective for children with particular characteristics.<sup>(42)</sup>

Overall, children who received the CBT treatment programme reported lower levels of anxiety at post-treatment, although data from parent-ratings do not support this conclusion. Conflicting findings between parent- and child-ratings of anxiety may have resulted from the differences in child and parent perceptions of the anxious feelings. The support for this explanation on the discrepancy between child and parent measures can be found in research findings suggesting that a low level of agreement between children's self-report and other informants, such as parents, is fairly typical.<sup>(43,44)</sup>

It is also possible that the difference in child and parent perceptions of anxious feelings could be due to the small sample size; this may be rectified by an on-going study on a randomised clinical trial of a manualised group CBT intervention involving a larger sample size.

The broader impact of the group CBT intervention on the parent's and teacher's quality of life was also measured. Findings from the pilot study indicated a significant reduction in parental stress, and a non-significant reduction in teacher stress, at posttreatment. These findings seem to suggest that structured interventions, like the CBT group programme, do not only improve the child's anxiety, but can also improve other aspects of functioning of those who care for them. These findings are consistent with existing literature that found the association between improved child behaviour and lower parent-related stress.<sup>(45,46)</sup> In a similar vein, anxiety reduction has been found to help youths with ASD improve behavioural regulation and flexibility, which in turn ameliorates functioning in school and relationships.<sup>(6)</sup>

Despite these encouraging findings, some caution is needed in interpreting the results from this pilot study, due to the small number of participants and the absence of a control group. Firstly, the data may not be reflective of the wider population of anxious children with HFA. Secondly, without a control group, it is difficult to attribute treatment effects to the group CBT treatment alone. Limitations of this pilot study have been addressed in the on-going study on a randomised clinical trial of a manualised group CBT intervention for children with HFA.

Findings from the pilot study provided support for the limited treatment-outcomes studies on CBT to address anxiety among HFA children.<sup>(16,31)</sup> It also provided additional evidence to address the need for a systematic evaluation of the CBT as an effective treatment for high-functioning children with ASD. In addition, this pilot study represents an application of cognitive-behavioural intervention in an Asian context. There has been little known published research on cognitive-behavioural intervention for children with ASD in Asia. By empirically validating a locally-relevant manualised treatment and measuring its efficacy, we will be able to the clinical alternatives available for children with ASD.

## ACKNOWLEDGEMENTS

This study (no. NMRC/1002/2005) is sponsored by a research grant from the National Medical Research Council, Singapore. Special thanks go to the Autism Resource Centre (Singapore), children, parents, and teachers, who contributed to this research.

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