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ELEVATED ANXIETY IN YOUTH WITH AUTISM SPECTRUM DISORDER AND THE  
IMPLICATIONS OF USING COGNITIVE BEHAVIORAL THERAPIES AS AN EFFECTIVE  
TREATMENT PLAN

A MASTER'S THESIS  
SUBMITTED TO THE FACULTY  
OF BETHEL UNIVERSITY

BY

NICHOLE OLSEN

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

MASTER OF ARTS IN EDUCATION

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BETHEL UNIVERSITY

ELEVATED ANXIETY IN YOUTH WITH AUTISM SPECTRUM DISORDER AND THE  
IMPLICATIONS OF USING COGNITIVE BEHAVIORAL THERAPIES AS AN EFFECTIVE  
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APPROVED

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## Abstract

As educators, we have seen Autism Spectrum Disorder (ASD), anxiety levels, mental health issues, and explosive behaviors rise in the general education population as well as the special education population in the last five years. The need for effective research based treatment plans is a very high demand in order to best serve our rising ASD population with comorbid anxiety in the school setting. There is building evidence in research that supports positive outcomes when using Cognitive Behavioral Therapies (CBT) for adolescents with ASD comorbid with anxiety who have some emotion recognition abilities as well as age appropriate intellectual and verbal abilities (McNally, Keehn, Lincoln, Brown, & Chavira 2013). Ung et al. (2015) believes there should be continued research surrounding this issue in order to really understand the moderators and other factors that have an influence on treatment efficacy and how to produce the greatest post treatment reduction in anxiety symptoms. There has been research since that would imply that CBT does in fact have a lasting impact on children when they measure effectiveness at 1-year, 2-year, and 3-year post CBT treatment plans. Continued research into what combinations work best as a treatment plan to most effectively serve our ASD population is needed, however CBT is a promising start.

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## CHAPTER I: INTRODUCTION

How does anxiety affect students with Autism Spectrum Disorder (ASD), and what cognitive behavioral therapies are best to help reduce symptoms of anxiety in students with Autism?

Autism Spectrum Disorder (ASD) refers to a range of neurodevelopmental disorders including autism, Asperger's syndrome (AS) and pervasive developmental disorder-not otherwise specified (PDD-NOS) (Sharma, Gonda & Tarazi 2018). The diagnostic criteria for ASD focuses on two core domains: social communication impairment and restricted interests/repetitive behaviors (Sharma et al., 2018). Sharma et al. (2018) stated that the prevalence of ASD has been steadily increasing over the past two decades with current estimates reaching up to 1 in 36 children. It has been found that nearly seventy-five percent of ASD patients also suffer from some type of comorbid psychiatric illnesses or condition.

Anxiety, in particular social anxiety symptoms, are common among cognitively unimpaired youth with autism spectrum disorder. Co-occurring anxiety can cause acute distress, amplify the core symptoms of ASD and trigger behavioral problems (Factor, Ryan, Farley, Ollendick, & Scarpa, 2017). Anxiety refers to specific psychiatric disorders that involve extreme fear or worry, and includes generalized anxiety disorder (GAD), panic disorder and panic attacks, agoraphobia, social anxiety disorder, selective mutism, separation anxiety, and specific phobias (Macneil, Lopes, & Minnes, 2009). Higher anxiety symptoms in children with ASD are found to be associated with more behavioral

problems and higher life interference and seem to negatively affect quality of life, over and above the difficulties associated with ASD (van Steensel & Bögels 2015).

### **Rise of ASD and Anxiety Related Behaviors in the Classroom**

Educators have seen anxiety levels, mental health issues, and explosive behaviors rise in the general education population as well as the ASD population in the last five years. How do educators combat the rise in anxiety levels, explosive behaviors, meltdowns, and loss in stamina for learning? Individuals with ASD have shown to be at a greater risk for developing anxiety due to their inhibited temperament, physiological hyperarousal and information-processing biases that then cause maladaptive behaviors to develop (McNally et al., 2013). Children with ASD are more vulnerable than the general population or typically developing (TD) adolescents to develop clinical levels of anxiety and related symptoms.

Because children with ASD are at higher risk for having clinical anxiety and the related symptoms it is very important to develop a treatment plan that will effectively help to reduce their anxiety related symptoms. Cognitive Behavioral Therapy (CBT) has been deemed the treatment of choice for TD children with anxiety (McNally et al., 2013). Cognitive Behavioral Therapy is therapy in which patients reframe their negative thinking patterns into positive ones. Evidence supporting relatively intact emotion recognition abilities in individuals with age appropriate intellectual and verbal abilities suggests that CBT may be a plausible and appropriate intervention for the ASD population as well (McNally et al., 2013).



What are the factors that amplify one student's behaviors vs another student's behaviors? Often times adolescents with ASD have a higher risk of anxiety and stress due to their deficits in regards to navigating social situations. Educators need to understand how to implement CBT strategies effectively within the classroom in order to meet student needs so that they can begin to feel what success looks like in social situations in the school environment while simultaneously reducing their levels of anxiety. Finding valid ways in which educators can help their students with ASD and anxiety co-occurrence who are cognitively non-impaired needs to become a priority in the educational system as the population with ASD and anxiety is growing rapidly.

Center-based programming for students with ASD has shown to be effective in helping students with ASD to feel like they have a "home base" while at school. Center-based classrooms are in theory designed to function with structured teaching principles. Structured teaching is when a classroom is designed to have an organized environment with visuals, sensory input/output, and appropriate activities that help to reduce stress, anxiety, and frustration in students with ASD. This classroom functions in order to give students a calming space, a quiet space, a safe space, a routine oriented consistent space, so that they have less to worry about while at school. Much like how CBT attempts to reframe negative thoughts into positive thoughts, center-based classrooms are designed to help re-frame a student's negative thoughts about their school environment. A center-based program should in fact help students to realign their thought process to a positive one as the structures and supports they have in place in a

center-based classroom aide in that reframing process. There are plenty of students with and without ASD who do not need this “home base” while at school, but for the ASD population who have high levels of anxiety and related symptoms and behaviors this is a safe haven for them to learn the skills they need to be able to more effectively navigate through the school environment.

The guiding question in this thesis will not only help students with ASD and comorbid anxiety, but will seek to find information that will help combat the changing student population as a whole. If educators can help reduce anxiety levels and behaviors within the school environment, then the result would be that anxiety behaviors and the related symptoms will be reduced not only in the school environment, but also in their home life environments. By giving students the tools to be successful and helping them to manage their anxiety and ASD properly, educators can set them up for successful futures.

## CHAPTER II: LITERATURE REVIEW

### Literature Search Procedures

Chapter two reviews the published literature on Autism Spectrum Disorder (ASD), the comorbidity of anxiety, and the Cognitive Behavioral Therapies (CBT) that are effective in treating both. It will examine the research behind why ASD and anxiety have a high co-occurrence and which CBT's are most effective in a treatment plan, and what implications this has for the use of CBT's along with pharmacological assistance.

To locate the literature for this thesis, searches of Educator's Reference Complete, ProQuest Education Database, Education Journals, ERIC, EBSCOhost Academic Search Premier, and EBSCO MegaFILE were conducted for publications from 2009-2018. This list was narrowed by only reviewing published empirical studies from peer-reviewed journals that focused on cognitive behavioral strategies that were found to be effective in youth with comorbid ASD and anxiety, found in journals that addressed the guiding questions. The key words that were used in these searches included "cognitive behavioral therapies," "CBT, ASD, and anxiety," "ASD, anxiety, and CBT effectiveness," "CBT," and "comorbid conditions."

The structure of this chapter is to review the literature on co-occurring ASD and anxiety, cognitive behavioral therapies and their effectiveness in treating both in six sections in this order: Elevated Anxiety in Youth with ASD; Traits and Assessment; Cognitive Behavioral Therapies; Cognitive Behavioral Therapies in Adults with ASD; Cognitive Behavioral Therapies and Physiological Implications; and Societal Costs.

### **Elevated Anxiety in Youth with ASD**

Macneil et al. (2009) found that the existing research showed that children with ASD displayed a very high level of anxious behaviors and symptoms. The types of anxiety that these individuals displayed were; generalized anxiety, separation anxiety, social anxiety, phobias, panic disorders, and obsessive compulsiveness. Macneil et al., (2009) stated that the research surrounding this topic showed that children and adolescents with ASD show a higher level of anxiety than that of the general population.

Factor, Ryan, Farley, Ollendick, and Scarpa (2017) conducted a study that compared impairment scores (social responsiveness scale, 2<sup>nd</sup> edition; SRS scores) in 57 children (3-17 years, 82.5% male) with ASD per parent report. Children with heightened anxiety problems showed higher scores on four SRS-2 subscales (Social Cognition, Social Communication, Social Motivation, and Restricted Interests, and Repetitive Behavior) (Factor et al., 2017). Children with heightened ADHD traits showed higher scores on two subscales (Social Communication and Social Awareness) (Factor et al., 2017). The findings in this research suggest that both ASD symptoms may worsen with the comorbid diagnosis of anxiety or ADHD which would line up with the findings of (Macneil et al., 2009). Factor et al. (2017) stated that their findings indicate significant impairment associated with ASD is exacerbated by the co-occurrence of clinical anxiety or ADHD symptoms, with some similarities and some differences based on clinical anxiety or ADHD symptom co-occurrence.

Maddox and White (2015) conducted a study to examine the clinical presentation of Social Anxiety Disorder (SAD) in adults with ASD. They hypothesized that at least one-

third of the individuals with ASD in the group would meet diagnostic criteria for SAD.

Their results were consistent with previous research and their hypothesis.

Rodgers, Riby, Janes, Connolly, and McConachie (2012) studied 34 young people with ASD diagnosed through a multidisciplinary team assessment following guidelines of the UK National Autism Plan for Children and were aged 8-16 years, and 20 children with Williams Syndrome (WS) ages 6-15. The mean estimated Full Scale IQ (FSIQ) for the ASD group was 97 and the FSIQ for the WS group was 52.2 which was within range reported as typical for individuals with WS (Rodgers et al., 2012). Behavioral questionnaires and anxiety rating scales were used to assess each group and their anxiety levels. In line with previous research Rodgers et al. (2012) found high levels of anxiety in a sample of youth with ASD and also in a sample of young people with WS. The mean level of anxiety in the ASD group was above that of clinically anxious children (Rodgers et al., 2012). This finding has also been shown in previous research such as Macneil et al. (2009), Factor et al. (2017), and Maddox et al. (2015).

Both Factor et al. (2017) and Rodgers et al. (2012) stated that their ASD sample had higher levels of anxiety across a range of sub-scales (panic disorder, separation anxiety, social phobia & Obsessive Compulsive Disorder (OCD)) compared to the children with WS or without ASD. These findings are in line with all of the research that shows ASD youth are at risk to be clinically anxious and in fact exhibit higher anxiety levels as compared to those that are clinically anxious youth without ASD. While the assessments they used may have been limited as they relied on parental report versus formal clinical assessments, it still shows findings consistent with previous research in

that ASD youth and adults have a higher risk of experiencing and exhibiting clinical anxiety related symptoms.

Rodgers et al. (2012) also stated that the ASD population seems to be at a higher risk perhaps related to their poor social understanding, furthering the need for good social skills training and programs. This clearly indicates that educators should be aware that students with ASD have a higher probably to exhibit anxiety related symptoms and that they need to keep this in mind during routine assessments in order for their students to receive timely support (Rodgers et al., 2012).

### **Traits and Assessment**

(Mayes, Calhoun, Murray, & Zahid 2011) studied mothers of 627 children with autism (ages 1-17, IQs 16-146). The mothers completed the Pediatric Behavior Scale. Maternal ratings of anxiety and depression increased with age and IQ, but were unrelated to gender, parent occupation, and race. Anxiety and depression were highly correlated with each other and with autism severity, somatic complaints, mood disturbance, and social problems (Mayes et al., 2011). This showed that the strongest predictors of anxiety and depression in children with autism was the autism severity, verbal IQ, and age. Anxiety was shown to be present in most children with autism and depression in about half. This study did not go directly into the research surrounding cognitive behavioral therapies and the effectiveness of CBT in children with autism, but it did state that there is relevant research showing that CBT decreases anxiety in children with high-functioning autism, but there are no studies that have investigated the efficacy with children who have low-functioning autism (Mayes et al., 2011).

Factor et al. (2017) showed in their study like ones similar to it that children with ASD should be routinely assessed for anxiety and ADHD in order to provide the most accurate and effective treatment plan. Factor et al. (2017) stated that the findings of their study had implications for treatment plans for children with ASD.

Settipani, Puleo, Conner, and Kendall (2012) explored the characteristics and symptomatology of anxious youth with ASD traits. They looked at the coping abilities of youth with and without elevated levels of ASD symptoms. The study consisted of 100 youth (aged 7-16) who had met criteria for an anxiety diagnoses. They used interview type questionnaires and rating scales to determine the child's level of anxiety and ASD symptoms. It was found that youth with meaningful ASD symptoms comprised 42% of the sample (Settipani et al., 2012). They found that youth with elevated ASD symptoms were significantly more likely to meet diagnostic criteria for social phobias than youth without ASD symptoms, this seems to be consistent with other studies. Settipani et al. (2012) found that consistent with previous research indicating that ASD youth have a higher rate of specific phobias than youth in the general community, in particular social phobias. Settipani et al. (2012) discussed the distinguishing differences between Generalized Anxiety Disorder (GAD) in regards to interpersonal worry versus social phobias. Social phobias are often the fear of not meeting the standards set by others; by contrast GAD is usually associated with self-imposed standards (Settipani et al., 2012).

The findings in this study show that a large percentage of youth presenting for treatment at an anxiety clinic have meaningful symptoms of ASD (Settipani et al., 2012). The differences between clinically anxious youth and clinically anxious youth with ASD

symptoms seem to be distinguished by their differences in anxiety symptoms. Settiani et al. (2012) talked about how children with ASD symptoms are less likely to benefit from individual CBT versus family/group CBT treatment. Like in previous studies this shows the importance of screening children for anxiety when they have ASD presenting deficits. The reason for this would be to create the most effective treatment plan possible. Often times schools have group social skills classes for students with ASD, which is in-line with the research findings that group therapy may benefit students with ASD and comorbid anxiety more in helping to address their social awareness deficits head on.

Like Settiani et al. (2012), Rodgers, Glod, Connolly, and McConachie (2012) studied repetitive behavior in two groups of children with autism spectrum disorder, those with high anxiety and those with lower levels of anxiety. They found that children with higher levels of anxiety had more repetitive restrictive behaviors (RRB) and also higher levels of insistence on sameness. Participants were 67 young people with ASD diagnosed through multidisciplinary team assessments (Rodgers et al., 2012) who were aged 8-16 years. There were two studies that they conducted; one was exploring the neuropsychological underpinnings of RRB and the pilot trial of an intervention for high anxiety. The children with in the RRB group were reported to have significantly higher levels of anxiety (Rodgers et al., 2012) and that higher levels of anxiety meant with the RRB behaviors was correlated with having higher levels of insistence on sameness and circumscribed interests.



Rodgers et al. (2012) stated that their findings may suggest that anxiety is in fact an intrinsic motivator for repetitive behaviors in children with ASD. Because anxiety may in fact be a strong motivator for the repetitive behaviors that then looks like insistence on sameness and circumscribed interests, but it is in fact a maladaptive coping response to negative feedback. They stated that results do confirm that children with ASD who experience anxiety also present with greater levels of RRB. Suggesting that children with ASD may use insistence of sameness to reduce demand in anxiety provoking situations (Rodgers et al., 2012).

White, Bray, and Ollendick (2012) evaluated the structure and construct overlap of two screening measure of Social Anxiety Disorder (SAD) and Autism Spectrum Disorder (ASD). 685 university students enrolled in this study between ages 18-22. The study was conducted at a large university in the Southeast United States. A questionnaire (AQ) was given to these students that had four-point responses was developed to measure the characteristics of autism and the other instrument used was a screening instrument for SAD in adults. The two questionnaires were then taken and evaluated for comparisons and similarities for ASD and SAD. (White et al., 2012) found that the group difference with respect to ASD-related symptoms cannot be explained solely by the existence of the construct overlap related to social anxiety and social difficulties. Like Settapani et al. (2012) this study showed the importance of screening children for anxiety when they have ASD presenting deficits. White et al. (2012) also stated that given the degree of construct overlap, it is important to assess ASD and social anxiety symptoms together, at least in higher functioning individuals who present

with apparent social worries or anxieties and significant social difficulties, to avoid misclassification. The results of this study provided additional support to the conceptualization of the co-occurrence of ASD and SAD as a situation of “true comorbidity”, not due to imprecise measurement or diagnostic overlap alone (White et al., 2012). This study talked about how very similar ASD and SAD symptomology can be and that it is often times hard to distinguish the two as Settapani et al. (2012) also found. In order to avoid over diagnosis of ASD in people with SAD, it is recommended that clinicians also consider behaviors less primary to SAD, such as a strong preference for sameness/routine, heightened attention to detail, circumscribed interests, and a preference for being alone (White et al., 2012).

People with social anxiety may have difficulty navigating social situations and feel extreme distress, but the social problems tend to not be as severe as what is typical of ASD (White et al., 2012). When considering what treatment plans to implement it is necessary to understand if the child has ASD or SAD or a comorbid ASD/SAD/or any other anxiety combination. The approach to CBT will need to be tailored to fit the person’s needs. CBT therapy is used for both ASD comorbid with anxiety and SAD, but the treatment approach may differ depending on each individual. Typically, a group social skills lesson is more of an exposure training method where they are systematically presented social situations that give them heightened anxiety levels and then given coping mechanisms to help them deal with the situation. Whereas CBT for SAD can be more focused on addressing the automatic negative thoughts, and replacing them with more realistic, positive views. This research shows the importance of adopting accurate

assessment methods in order to weed out the differences in ASD and anxiety within individuals so that they can be given the most effective treatment plan possible.

**Cognitive Behavioral Therapies.** van Steensel et al. (2015) examined the effectiveness of cognitive-behavioral therapy (CBT) for anxiety disorders in children with autism spectrum disorders (ASD) and compared with children without ASD. Children with ASD and comorbid anxiety disorders and children with anxiety disorders and their parents, participated. Families were referred to 1 of 7 mental health care centers and all received the same CBT. Anxiety, quality of life, ASD-like behaviors, and emotional-behavioral problems were measured for both groups at pretest, posttest, 3-months, 1-year, and 2-years after CBT (van Steensel et al., 2015). Participants were 7-18 years of age and their parents who received CBT treatment for anxiety disorders at one out of the seven community mental health care centers. There were 79 children that were diagnosed with ASD and comorbid anxiety disorders (the ASD-group) and 95 children who had anxiety disorders with ASD (the AD-group). The intervention consisted of a combined version of family and individual CBT programming, (van Steensel et al., 2015).

Factor et al. (2017) found similar research showing that cognitive behavior therapy when used to target anxiety in children with ASD, showed a significant reduction in anxiety symptoms post treatment. This suggests that the ability to target anxiety related symptoms can be improved using CBT. Factor et al. (2017) also looked at social skills training for children with ASD, and the results demonstrated an increase in social interactions as well as a reduction in restricted and repetitive behaviors. (Factor et al., 2017) suggest that using CBT and social skills training you can reduce restricted and

repetitive behaviors (social skills training) and anxiety-related behaviors (CBT targeting emotion regulation deficits).

van Steensel et al. (2015) stated that the first key finding in this study was that standard CBT for anxiety disorders is effective for children with ASD, and that treatment gains were maintained up to 2 years. CBT was found to be superior versus waitlist, which is in line with previous studies (van Steensel et al., 2015). The second key finding was that the ASD-group showed less improvement over time versus the AD-group, however this can be explained by the fact that children with ASD often times have more trouble implementing and generalizing learned skills across settings and that their ASD symptoms may have interfered with treatment effectiveness. van Steensel et al. (2015) found that children in the ASD-group were less likely to be free from all anxiety disorders and were less likely to move from a clinical to a normal score. Due to the fact that children with ASD are characterized by their social discrepancies it would make sense that they would not be free from all anxiety related symptoms. That is to say, just because the study showed less of a positive increase in anxiety related symptoms in the ASD-group it does not mean that it was not an effective treatment plan.

van Steensel and Zegers (2017) aimed to look into the predictors of what would impact treatment effectiveness in a sample of 79 children with ASD who received cognitive behavioral therapy (CBT) for their anxiety disorders. In order to be included in the study the children had to have a formal diagnosis of ASD, have at least one formally diagnosed anxiety disorder, and at least one parent willing to participate. Exclusionary factors were an IQ less than 70, un-treated psychotic disorder, acute suicidal risk, and

current physical or sexual abuse. The severity of each child's anxiety was used to measure the effectiveness of the treatment, this was done at pre-treatment, post-treatment, 3-months, 1 and 2 years after receiving CBT. All children in the study had at least one anxiety disorder, however most children had multiple anxiety disorders. The children's most impairing anxiety disorder in the ASD group consisted of: specific phobia, social anxiety disorder, generalized anxiety disorder, separation anxiety disorder, agoraphobia, and panic disorder. Comorbid anxiety disorders (next to the primary anxiety disorder) were; specific phobias, generalized anxiety disorder, and social anxiety disorder. It was found that children that came from anxious fathers (not mothers) and children in "un-involved" families had less anxiety symptoms at pre-treatment and displayed a less steep decline. van Steensel and Zegers (2017) stated that this could have been because children that come from families with non-anxious fathers and are less involved in their children's lives might not be as prone to seek out treatment for anxiety related symptoms because they are less aware of what anxiety looks like and if their children are exhibiting signs of anxiety. Children that came from "authoritarian" families showered higher pre-treatment anxiety levels but responded quite well to treatment. The research that van Steensel and Zegers (2017) did stressed the importance of paternal and family factors in the treatment of anxiety disorders in youth with ASD.

Luxford, Hadwin, and Kovshoff (2017) looked at the effectiveness of school-based Cognitive Behavioral Therapies (CBT) on symptoms of anxiety, social worry, social responsiveness, attentional control, and attentional biases to threat on students

with Autism Spectrum Disorder. They conducted a study that had 35 pupils from four mainstream secondary schools in south-east England. All participants were required to have a formal diagnosis of Autism Spectrum Disorder (ASD) from a qualified health professional, not just an educational label. Participants also needed to have a verbal and total IQ score of greater than or equal to 70. The participants also needed to be experiencing clinically significant symptoms of anxiety as measured by teacher or parent report, but not receiving active treatment or medication for said anxiety. Participants also needed to attend at least 5 out of the 6 intervention sessions to be counted in the study. The researchers used multi modal ways of collecting data, they had behavioral/anxiety rating scales, social worries questionnaires, social responsiveness rating scales, IQ testing, attentional control tasks, attention to threat tasks, in order to get a baseline of where the participants were at. The researchers then were able to measure the amount of change the CBT interventions had on each participant and whether or not the CBT interventions were effective in eliciting a measureable change in anxiety reduction. Luxford et al. (2017) stated however, that parent involvement was crucial as they had “homework” activities that needed to be done at home coupled with what they were learning at school. Luxford et al. (2017) stated that while emerging findings have been encouraging, there are still relatively few studies that have fully assessed the effectiveness of CBT for young people with ASD and these have typically been explored only in clinic-based settings.

Ekman and Hiltunen (2015) began talking about the developing research that suggests that Cognitive Behavior Therapy (CBT) is beneficial to people with Autism

Spectrum Disorder (ASD) but that the methods need to be modified in relation to their cognitive profile. This study was carried out in three different settings and cities: a private clinic, a child and adolescent psychiatric clinic, and at a treatment center for youth. The therapists were proficient and experienced CBT therapists of clients with ASD and CBT. It was a quantitative study with four assessments, two at the pre-assessment stage, and one in mid-therapy and end of therapy respectively. The average time between pre-treatment and start of therapy was 1.86 months, between start of therapy and mid- therapy assessment 2.56 months and between mid-therapy and the end of therapy 2.88 months Ekman and Hiltunen (2015). All participants were diagnosed with ASD and anxiety. The CBT treatment was conducted individually for 15 sessions. What Ekman and Hiltunen (2015) found was that when pairing visualized language with the CBT sessions the results showed a significant change in behavioral excess and avoidance behavior, for anxiety level and frequency, and cognitive excess behaviors for anxiety level. Because the CBT modification was using visualized language throughout the entire sessions it made the conversation systematic and concrete, which made it easier for ASD clients to follow a conversation Ekman and Hiltunen (2015).

Maddox, Miyazaki, and White (2017) evaluated change in social skills during a randomized controlled trial of CBT and during the 1-year follow up for 25 adolescents with ASD and anxiety. They found that CBT targeting social skills and anxiety can lead to long-term improvements in social functioning (modified CBT). Primary outcome data from this treatment program demonstrated a significant improvement in social impairment in the treatment group from pre-to post treatment (Maddox et al., 2017).

This study was conducted at a university-affiliated clinic specializing in ASD. Participants were aged 12-17 years; met diagnostic criteria for ASD, and had an anxiety disorder (Maddox et al., 2017). There were 30 total eligible adolescents that were enrolled in the program. 15 were randomized to begin the treatment plan immediately, while 15 were randomized to a 14-week waitlist condition, after the waitlist period the waitlist group began the intervention. The treatment program included 12-13 individual CBT sessions, seven group meetings to practice social skills, and parent education and involvement (Maddox et al., 2017).

This study emphasized the post treatment period and the specific need for booster sessions in order for adolescents that have gone through CBT for anxiety and ASD will be able to continually generalize their skills across settings. Previous CBT studies with youth who have ASD and anxiety reported on the long-term outcomes of anxiety symptoms, without investigating the maintenance of social skill improvement while this study did look at the social skill improvement over time (Maddox et al., 2017). They found that social impairment was significantly improved over the course of active treatment, and was mostly maintained through the 3-month follow up assessment suggesting that participants and their parents actively practiced and generalized the skills learned from treatment (Maddox et al., 2017). Key findings here are having active parents in the adolescents ASD/anxiety treatments. Educators may still struggle with children whose parents are not actively involved in the treatment of their children. However, it is promising that this study shows that while active treatment is happening there is a significant boost in their social skill abilities as well as less anxiety symptoms



that are exhibited. Meaning that educators can be using CBT modified approaches to their social skills lessons and be able to see an improvement in the behaviors that the student elicits, regardless of parental participation. Knowing that parental participation will give the adolescent the greatest gains in their treatment plan, it is vital to get the parent actively involved if at all possible. Maddox et al. (2017) stated that future studies should include larger samples and consider additional factors that may affect variability in treatment response. Because there is growing evidence for the interconnectedness among anxiety, loneliness, social impairment, clinicians should strongly consider treatment programs with a dual focus on improving anxiety and social impairment for adolescents with ASD (Maddox et al., 2017).

Sung, Ooi, Goh, Pathy, Fung, Ang, Chua and Lam (2011) conducted a 16-week Cognitive Behavioral Therapy (CBT) program and Social Recreational (SR) program on anxiety in children with Autism Spectrum Disorders (ASD). Seventy children (9-16 years old) were randomly assigned to either of the programs. Anxiety scales were administered pre-, post-treatment, and follow-ups 3- and 6-months). Children in both programs showed significantly lower levels of generalized anxiety and total anxiety symptoms at 6-month follow up on the anxiety rating scales. The findings in this study suggest that factors such as regular sessions in a structured setting, consistent therapists, social exposure and the use of autism-friendly strategies are important components of an effective framework in the management of anxiety in children and adolescents with ASD (Sung et al., 2011). They stated that the CBT program consisted of modifications and adaptations from CBT programs such as *The Coping Cat Program*,

*Exploring Feelings*, and unpublished anxiety management program from the CGC and Autism Resource Centre. The sessions incorporated items that have proven useful with children with ASD such as the use of structure, visual strategies, role-plays, and Social Stories. The CBT program conducted sixteen 90-min weekly sessions delivered in small groups of 3-4 participants and each group was conducted by 2 therapists. The participants were also given homework in attempt to get them to generalize their newly learned tools into more than one setting.

The SR program also received a sixteen week 90-min weekly sessions delivered in small groups of 3-4 participants and each group was run by 2 therapists. This group also had homework and it consisted of similar activities they were doing within their groups that they could try to play outside of the group. This group was much more like a group social skills class that was geared toward learning while playing and learning self-development skills (like cooking). CBT strategies and inappropriate behaviors were not addressed directly in teaching unless something arose while participating in an activity together that needed to be addressed in order to continue the groups cohesiveness. Sung et al. (2011) stated that both groups showed significant reduction in generalized anxiety and total anxiety symptoms at 6-month follow-up. Both programs shared common elements, namely regular sessions in a structured setting, consistent therapies, social exposure, and the use of useful strategies for ASD children. Sung et al. (2011) stated that the mere act of incorporating these elements in sessions will serve as an effective framework in the management of anxiety in children and adolescents with ASD. Sung et al. (2011) stated that school and community based programs that then

incorporate these structures and basic elements to their programs may have the potential benefits in managing anxiety in children with ASD.

McNally, Lincoln, Brown and Chavira (2013) piloted a study to evaluate whether a modified version of the Coping Cat program could be effective in reducing anxiety in children with autism spectrum disorder (ASD). Twenty-two children (ages 8-14; IQ greater than 70) with ASD and clinically significant anxiety were randomly assigned to 16 sessions of the Coping Cat program (cognitive-behavioral therapy; CBT) or a 16-week waitlist. Children in the CBT group showed significantly larger reductions in anxiety than those in the waitlist. Children in the CBT condition received a 16-week manualized cognitive-behavioral intervention according to the Coping Cat program (McNally et al., 2013). The goal of this program is to teach children to be aware of anxiety arousal and have that awareness be a cue to implement anxiety management techniques. The 16 sessions were divided into two content-based parts; sessions one through eight were focused on skills training (e.g., affective education, awareness of somatic sensations associated with anxiety, cognitive restructuring, developing a coping plan, and evaluating performance and administering self-reinforcement) and sessions nine through 16 were focused on exposure tasks in hierarchical sequence of anxiety-provoking situations (McNally et al., 2013). They incorporated parent training in two sessions to help the parents understand what the goals of the treatment were and how they could continue the skills being used at home as the children had homework tasks that they needed to complete weekly in attempt to help the children to generalize the skills across settings. Modifications were made to the Coping Cat

program in order to better accommodate the learning style of children with ASD. The

following modifications were made to the Coping Cat program:

1. Following each session, 10–15 min was spent on reviewing the content covered, skills learned, and homework assigned with parents in order to increase children’s homework compliance and skill generalization.
2. Session duration was lengthened to 60–90 min to allow more time to thoroughly cover session content at a pace appropriate for children with ASD.
3. Additional written and visual materials (e.g., written schedules, pictorial scale of anxiety) were utilized to accommodate children’s visual style of learning.
4. Concrete language was used to accommodate children’s literal and sometimes rigid language and thought patterns.
5. Children’s specific interests and preoccupations were integrated into the treatment when appropriate in order to build rapport, increase understanding of therapeutic material, and motivate participation.
6. Children with attention and concentration difficulties were offered frequent sensory input through the use of sensory stimulating objects or proactive movement breaks.
7. For children with motor difficulties, in-session writing tasks were completed with the help of the therapist or computer in order to reduce motor burden.
8. In order to adhere to the stated goals of each session, all components of the treatment were administered to each child. However, in keeping with a child-centered, individualized approach, the particular learning style of each child was respected. For example, for some children who had more difficulty with cognitive restructuring due to their particular learning profile, behavioral components of the program were emphasized over cognitive components (e.g., more time was spent on relaxation, role-plays, and exposure tasks than on cognitive restructuring).
9. Reinforcement strategies were enhanced and/or tailored to each child individually (McNally et al., 2013, p 61).

This was the first study that looked at whether or not a modified version of the Coping Cat program could be effective for reducing anxiety in children with ASD (McNally et al., 2013). They found that overall the study provided promising initial evidence that despite high levels of anxiety and comorbidity, children with ASD who completed the 16-week Coping Cat program experienced a larger reduction in anxiety symptoms than those receiving no treatment or treatment as usual (McNally et al., 2013). Like previous studies McNally et al. (2013) stated that further research is needed to replicate and expand upon this pilot study. Furthermore, studies that have delved into the comorbidity of anxiety and ASD have had to rely on parent reports and there are real concerns surrounding the parent's perception of what anxiety is and how it manifests itself in each child. The implications of this study are positive in that if they can be replicated and expanded upon it would seem this is a very viable and doable option for children with ASD and comorbid anxiety.

Conaughton, Donovan and March (2017) studied 42 high functioning children with ASD ages 8-12 with a comorbid anxiety disorder who were assessed. The children were assigned to either the BRAVE-ONLINE (a CBT online program) (NET) condition or a waitlist control (WLC). Diagnostic interviews were completed by child/parent at pre-treatment, post-treatment, and 3-month follow-up. The treatment consisted of 10 children, and six parent sessions, each 60-minutes in length, that are completed weekly online via the Internet, as well as two booster sessions undertaken at one and three months after completion of the program. At post assessment compared to children with

WLC condition, children in the NET condition demonstrated a significantly greater reduction in anxiety diagnoses, clinical severity of diagnosis, and self and parent reported anxiety symptoms, as well as significantly greater increases in over function (Conaughton et al., 2017). This study aimed to evaluate the efficacy of an internet-based cognitive-behavioral therapy (CBT) intervention (BRAVE-ONLINE) for treatment of child anxiety disorders in children HFASD, (Conaughton et al., 2017). While there were not great results for a loss of diagnosis, there were significantly greater reductions for the NET group compared to the WLC group on all other measures over time, Conaughton et al. (2017) suggested that this shows that the program was effective in reducing anxiety and improving overall level of functioning for these children.

Murphy et al. (2017) studied 36 young people with ASD, ages 12-18. The randomized controlled trial compared use of CBT against person-centered counseling for anxiety in youth. Outcome measures included parent, teacher, and self-reports of anxiety and social disability. The study design had two study arms; a CBT intervention, the Multimodal Anxiety and Social Skill Intervention for adolescents with ASD versus individual counseling sessions. Assessments were performed at baseline, within 4-weeks of completion of treatment, and at a 12-week follow-up. This study did not find significant differences between CBT and counseling, but that does not mean that these interventions did not individually produce improvements in the participants. While this study did not see significant differences between the two groups it does show that either options are viable treatment plans for young people with ASD and comorbid anxiety.

Kerns, Collier, Lewin, and Storch (2017) also focused on Cognitive Behavioral Therapies as a promising treatment for cognitively able youth with autism spectrum disorder (ASD) and reducing anxiety levels, but also looked at therapeutic alliance. CBT has been promising in that it has been associated with medium to large ( $d=0.68-1.21$ ) reductions in anxiety across eight clinical trials (Sukhodolsky et al., 2013). However, this study addressed the need for therapeutic alliance in order to promote a positive behavioral change in the adolescent. When the alliance is strong and healthy due to the enhanced willingness of the child to learn the CBT concepts and strategies (Kern et al., 2017).

A meta-analysis was done that combined 14 studies and had a total of 511 participants. Two hundred eighty-three participants received CBT and 228 received the following: treatment as usual, waitlisted, or enrolled in the Social Recreation Program (Ung, Selles, Small, & Storch, 2015). The ages of the participants ranged from 7 to 17 years. All participants had ASD with an anxiety related disorder. This meta-analysis included a limited number of studies with significant heterogeneity in treatment effect sizes that could not be explained by the proposed moderators (Ung et al., 2015). However, Ung et al. (2015) concluded that although further research is needed in this area CBT was found to be an effective treatment at reducing anxiety in your with ASD. The meta-analyses found that moderators such as anxiety informant (i.e., child, parent, and clinician) and treatment modality (i.e., group sessions with or without parents versus individual sessions with or without parents) was not significant moderators of treatment responses (Ung et al., 2015). Ung et al. (2015) stated that therapist treating

youth with ASD and anxiety could continue to substantiate their choice of CBT in the treatment of anxiety and expect significant albeit moderate improvements. The conclusion drawn by past systematic review and meta-analyses that CBT is effective at reducing anxiety in you with high-functioning ASD was also supported by this study (Ung et al., 2015). Although anxiety informant and treatment modality were not statistically significant moderators of treatment effect, other factors not explored in this report may be and thus, are highlighted for future research (e.g., child and parents' level of motivation, child's and parents' level of insight, child's comorbid symptoms, treatment homework compliance, and child, parent and clinician rapport) (Ung et al., 2015). Due to limited number of studies included in this meta-analysis, treatment length was not explored as a moderator of treatment outcomes (Ung et al., 2015). This meta-analysis found that CBT treatments can help reduce anxiety symptoms in children with ASD moderately. Ung et al. (2015) believes there should be continued research surrounding this issue in order to really understand the moderators and other factors that have an influence on treatment efficacy and how to produce the greatest post treatment reduction in anxiety symptoms.

**Cognitive behavioral therapies and physiological implications.** Hollocks, Pickles, Howling and Simonoff (2016) studied 55 boys with ASD (34 with co-occurring anxiety disorder, 21 without) and 28 male controls, aged 10-16 years with a full-scale IQ greater than or equal to 70. They wanted to find out if there were both cognitive and biological correlations of anxiety in youth with ASD. They completed a series of clinical, cognitive, and biological measures associated with anxiety in typically developing populations



(Hollocks et al., 2016). The study found that while both cognitive and physiological factors are related to the degree of anxiety symptoms reported in this sample, only the physiological parameters were significant predictors of current anxiety disorders. Hollocks et al. (2016), stated that this study had two implications for those with ASD; first, differences in cognitive processing style may be a risk factor for developing anxiety disorder. And second, these underlying cognitive differences may be good targets for early intervention. This study was the first of its kind to combine both cognitive and physiological risk factors within a single model (Hollocks et al., 2016). This study is the first to provide evidence that there are both cognitive processing biases and differences in physiological responsiveness as pathways that may partially explain the high prevalence of anxiety in children and adolescents with ASD (Hollocks et al., 2016). In studies prior to this one focus was on anxiety symptoms measured by questionnaires and did not measure the physiological portion to anxiety in youth with ASD. The presence of cognitive factors that are similar to those found in relation to anxiety in the non-ASD population again supports studies that have suggested that CBT-based strategies and interventions have positive impacts as treatment options for youth with ASD and comorbid anxiety (Hollocks et al., 2016). Most of the research that supports CBT-based treatment does not directly address the pharmacological aspect of treatment except to say it may aide in the treatment plan as did Hollocks et al. (2016). They went on to state that combining psychological therapies with pharmacological intervention may provide additional benefits as well as offering an alternative approach for those who do not respond well to CBT or are of lower verbal ability (Hollocks et al., 2016).

They also did find emerging evidence that attentional bias modification training (ABMT) may reduce anxiety symptoms when augmenting treatments to CBT.

Mayes et al. (2011) suggest that the majority of high-functioning children with autism at all ages had anxiety. They stated that because autism is a neurobiological disorder it makes individuals with autism particularly vulnerable to anxiety and depression. They believed that all children with autism should then be screened for anxiety and depression. Research indicates that CBT decreases anxiety in children with ASD. Mayes et al. (2011) also stated that there is research indicating that SSRIs improve mood in children with autism, but that there is a critical need for further research to determine what therapies and medications can reduce the significantly high levels of anxiety and depression in children with autism.

**Cognitive behavioral therapies in adults with ASD.** Sizoo and Kuiper (2017) looked at 59 adults with ASD and anxiety or depression who gave consent to participate in a study that measured whether cognitive behavioral therapies or mindfulness based stress reduction were more effective in reducing anxiety scores, depression scores, and autism symptoms. Twenty-seven followed the CBT protocol and 32 followed the MBSR protocol. The anxiety, depression, autism symptoms, rumination, and global mood were registered at the start, at the end of the 13-week treatment period, and again at three-months follow up. Results indicate that both MBSR and CBT are associated with a reduction in anxiety and depressive symptoms among adults with ASD. It seems that both mindfulness and cognitive behavioral therapies are both promising treatment methods for reducing comorbid anxiety and depression in adults with ASD.

The mindfulness group focused on accepting the present and learning how to relax in the midst of whatever was going on, while the CBT group focused on addressing maladaptive thought patterns and changing them to be more positive. Both groups had homework they were required to complete. Sizoo et al. (2017) stated that to their knowledge this was the first study that compared specific protocols for adults with ASD to treat comorbid anxiety and depression. It was a modest sample size however so it does limit the generalizability of the results. Sizoo et al. (2017) stated that there were many limitations to this study even though the results of the smaller group size were promising. They were unable to take into account other factors such as pharmacological treatment and a control group. However, mindfulness and cognitive behavioral therapies are both promising treatment methods for reducing comorbid anxiety. MBSR showed some indications that it may be preferred over CBT with respect to treatment effect on anxiety when the scores on measures of irrational beliefs or positive global mood at baseline are high (Sizoo et al., 2017). This study dealt with adults and showed that MBSR seemed to have a slightly greater impact if the adults had irrational thought patterns to start with.

**Societal costs.** Steensel, Dirksen and Bögels (2013) aimed to estimate the societal costs in the Netherlands of children with high-functioning ASD and comorbid anxiety disorder(s), and compare these costs to children with anxiety disorders, and typically developing children. The total sample of this study consisted of 194 children aged 7-18 years; 73 children with high-functioning ASD and comorbid anxiety disorders, (referred to as the ASD + AD-group), 34 children with anxiety disorders (referred to as the AD-

group), and 87 typically developing children from the general population (referred to as controls) (Steensel et al., 2013). Children and parents participated in a longitudinal study examining the effectiveness of treatment for anxiety disorders. The children had to have at least one parent willing to participate, have at least one anxiety disorder, and have an IQ greater than 70 (Steensel et al., 2013). The primary findings of this study showed that the ASD+AD group had significantly higher societal costs than that of the AD-group or controls.

Steensel et al. (2013) stated that the costs associated with ASD are high, and considerably higher than the costs in children with anxiety disorders and typically developing children. The anxiety disorders seemed to contribute to the overall costs in children with ASD which would then imply that if these comorbid anxiety disorders could be treated effectively, the total costs of ASD may be reduced (Steensel et al., 2013). This study mentioned that CBT has been examined in several studies and that it has shown to have positive effects in treating children with ASD and comorbid anxiety, however since this study was examining the overall societal costs they were unable to report on that finding.

Steensel et al. (2013) stated that if treatment plans can be made that effectively address ASD and comorbid anxiety they believe the overall costs of ASD could be reduced. CBT is effective to treat anxiety in children with ASD and the effectiveness that is reported in those studies is quite comparable to that of clinically anxious children without ASD (Steensel et al., 2013). This study shows that the societal costs of adolescents who have ASD with comorbid anxiety are high and that finding the most

effective treatment plan is imperative not only for the welfare of the child, but for the burden it has on society as a whole. Children with ASD and comorbid anxiety can benefit greatly from CBT, but Steensel et al. (2013) stated that the long-term effects of CBT for children with ASD are still unknown when they did their study. There has been research since that would imply that CBT does in fact have lasting impact on children when they measure effectiveness at 1-year, 2-year, and 3-year post CBT treatment plans. Continued research into what combinations work best as a treatment plan to best serve our ASD population is needed, however CBT is a promising start.

### CHAPTER III: DISCUSSION AND SUMMARY

#### Summary of Literature

MacNeil (2009), Mayes (2011), Rodgers (2012), and Maddox (2015) all used multidisciplinary teams to assess the clinical presentation of ASD and co-occurring anxiety. Anxiety was shown to be present in most children with autism. The research that was done all showed that children with ASD displayed a very high level of anxious behaviors and symptoms and exhibited a higher level of anxiety than that of the general population. However, the anxiety levels in children and adolescents with ASD showed to be comparable to that of the clinically anxious population with some discrepancies that showed higher rates of anxiety in the ASD population (MacNeil, 2009; Rodgers, 2012). Rodgers et al. (2012) stated that further research will need to be conducted to explore their findings. There are limitations to this study such as parental report and the instruments that they used were normed against the typically developing population. This would need to be addressed in future research.

Settipani et al. (2012) found like MacNeil et al. (2015) that ASD youth have a higher rate of social phobias than that of the general population or that of the clinically anxious who do not have specific phobias. Settipani et al. (2012) and Rodgers (2012) both found that children with higher levels of anxiety had more repetitive behaviors and higher levels of instances of sameness. The research suggests that CBT can help our clinically anxious ASD population by reducing their need for repetitive behavioral patterns and insistence on sameness.

White et al. (2012) made it clear that given the degree of construct overlap it is imperative that ASD youth be assessed for both ASD and social anxiety symptoms together in higher functioning adults as they seem to go hand and hand. MacNeil (2009), Rodgers (2012), Settapani et al. (2012), White et al. (2012), Maddox (2015), and Factor et al. (2017) all stated that it can be hard to distinguish between the ASD symptomology and the clinical symptoms of anxiety furthering the need for research regarding diagnostic tools that can help to distinguish between the two diagnoses.

Luxford et al. (2017) used *Exploring Feelings* CBT intervention and a wait-list as a control group to evaluate whether or not CBT's would have a positive impact or change anxiety related behaviors in these students. Like similar research that has been done regarding CBT and treatment effectiveness for anxiety in our ASD population it was stated that the findings are encouraging and further research should be continued to further develop the most streamline treatment plans possible.

van Steensel et al. (2015) and van Steensel et al. (2017) first looked at the effectiveness of CBT for anxiety disorders in children with ASD and compared those results to children without ASD. While the first study showed less of a positive increase in post treatment reduction of anxiety related symptoms for the ASD population than their peers without ASD, the CBT treatment plan helped to reduce anxiety in the ASD population it just did not extinguish their pre-existing ASD related symptoms. van Steensel et al. (2017) looked to pinpoint what would impact treatment effectiveness in youth with ASD and co-morbid anxiety. Building off of their previous

research they found that children characteristics may have less of an impact on treatment effectiveness versus parental and family factors.

Maddox et al. (2017) evaluated change in social skills during a randomized controlled trial of CBT and during the 1-year follow up for 25 adolescents with ASD and anxiety. They found that CBT targeting social skills and anxiety can lead to long-term improvements in social functioning (modified CBT). Primary outcome data from this treatment program demonstrated a significant improvement in social impairment in the treatment group from pre-to post treatment (Maddox et al., 2017). McNally (2013), Ekman (2015), Conaughton (2017), and Maddox (2017) discussed the implications of cognitive behavioral therapy and the benefits to people with ASD. One finding that they all stated after their research was concluded was that modifying or adapting CBT to better align with the characteristics, traits, and learning styles of individuals with ASD is necessary to elicit the full benefits of CBT. McNally (2013), Ekman (2015), Conaughton (2017), and Maddox (2017) discussed that pairing visuals with language and having defined routines and structures will benefit our ASD population to be able to fully assimilate into a CBT treatment plan and elicit the greatest changes in behaviors. Maddox et al. (2017) also discussed the need for booster sessions for our ASD population that participated in CBT treatment plans in order to continually generalize their learned skills across settings.

Sung (2011), Kerns (2017), Murph (2017), and Sizzo (2017) all looked at different types of therapy versus cognitive behavioral therapy in youth with ASD and co-occurring anxiety. What they found was that most of these types of treatment plans had elements



of CBT. Sung (2011), Kerns (2017), Murph (2017), and Sizzo (2017) looked at individual counseling, mindfulness, social recreation programs, and the need for developing therapeutic alliance between the therapist and client. What they concluded was impactful in that the mere act of incorporating CBT elements can set the framework for an anxiety reducing environment for adolescents with ASD.

Further research is needed regarding cognitive behavioral therapies and treatment of adolescents with ASD, Steensel (2013), Ung (2015), and Hollocks (2016) found that CBT treatments can help reduce anxiety symptoms in children with ASD, but the need for further research is there in order to better understand what factors into treatment efficacy and post-treatment maintenance of skills. They looked at the societal costs in regards to the costs of continued research and concluded that the societal costs are too high to not pursue continued research in order to best diagnose and treat the adolescent ASD population comorbid with anxiety.

### **Limitations of the Research**

This thesis was written by looking at the literature on Autism Spectrum Disorder, the comorbidity of anxiety, and the Cognitive Behavioral Therapies that are effective in treating both. It examined the research behind why ASD and anxiety have a high co-occurrence and which CBT's are most effective in developing a treatment plan, and what implications this has for the use of CBT's along with pharmacological assistance.

To locate the literature for this thesis, searches of Educator's Reference Complete, ProQuest Education Database, Education Journals, ERIC, EBSCOhost Academic Search Premier, and EBSCO MegaFILE were conducted for publications from

2009-2018. This list was narrowed by only reviewing published empirical studies from peer-reviewed journals that focused on cognitive behavioral strategies that were found to be effective in youth with comorbid ASD and anxiety, found in journals that addressed the guiding questions. The key words that were used in these searches included “cognitive behavioral therapies,” “CBT, ASD, and anxiety,” “ASD, anxiety, and CBT effectiveness,” “CBT,” and “comorbid conditions.”

van Steensel et al. (2015) stated that one of the issues with the findings they had is that the instruments they used for assessing the children in their study were developed and normed for neuro-typical children or typically developing populations, this could inhibit the ability to differentiate reliably between the symptoms of anxiety and ASD. While the AD-group suffered from anxiety like the ASD-group, this study shows that the ASD symptoms can be exaggerated by comorbid anxiety in the ASD-group. The ASD-group still dealt with their ASD symptoms once their anxiety was reduced resulting still in a lessened life quality score. Whereas the AD-group did not have underlying symptoms to deal with once their anxiety had decreased. However, previous studies have noted that CBT is currently the most effective researched strategy in reducing anxiety related symptoms in children with ASD and that more research needs to be done surrounding the most effective treatment plans for children with ASD and comorbid anxiety.

All of the articles that were reviewed talked about how further research was needed as the current research available was limited and still developing. However, CBT was deemed to currently be the most effective way of treating ASD with comorbid

anxiety and that research into adaptations to CBT programs that are more tailored to the characteristics and traits of people with ASD could lead to the most effective and cohesive treatment plans.

### **Implications for Future Research**

Luxford et al. (2017) noted that while the research that was being done surrounded ASD co-occurring with anxiety and other behavioral diagnoses in regards to treatment with CBT was promising, it did have its own set of limitations. The researchers did not formally measure treatment integrity, as well as there was no active control group in most studies to explore whether or not CBT strategies were more effective than other interventions. Long term we need to have research that addresses both anxiety reduction and increasing social competency/attentional control in our ASD population.

van Steensel et al. (2017) looked at children diagnosed with ASD and comorbid anxiety disorders. They had a total sample of 79 children ranging from 7 to 18 years of age. They looked at varying factors that may play a role in the treatment effectiveness of using cognitive behavioral therapy for children with ASD and comorbid anxiety disorders. Multi-level analysis was used to examine which variables were the most important for being able to predict treatment effectiveness. This system was important so that missing data was not an issue for performing the analysis. The missing data could have been things such as; a parent not responding, or one or more assessment was missing, or only one parent being involved in the study.

This study was the first to address multiple predictors for the effectiveness of anxiety treatment in youth with ASD. There were many strengths of the study in regards to the clinical nature of the sample, the inclusion of family predictors, and the long-term assessments that measured the effectiveness of the CBT. If we can gain more insight into predictors of treatment efficacy we can create treatment plans that are individualized for each child in order to optimize the treatment effectiveness that has lasting impacts on their future. The study findings while still exploratory generate new hypotheses for future research that can help us to understand that children characteristics may have less of an impact on treatment effectiveness versus parental and family factors.

Mayes et al. (2011) stated that while their study did not go in depth into CBT and its effectiveness with ASD youth, it did show that there is a very high need to address the comorbidity of anxiety and depression in our ASD youth. This study shows that it is not a problem we can afford to ignore and that there must be more research surrounding this issue in order to better serve our ASD population.

### **Implications for Professional Application**

I find the research that Luxford et al. (2017) did very interesting because I am a middle school special education teacher for students with ASD, anxiety, and explosive behaviors. I believe it is our duty as educators to find ways in which we can effectively teach our students replacement behaviors and strategies to use that will help them across environments.

Often times students with ASD have a very difficult time generalizing what they have learned in a certain environment across environments, the researchers throughout this literature review addressed this by having what was being taught at in the clinical setting or school flow through to their home environments with activities for parents to participate in with their children. Our students need to be able to generalize what they learn in my classroom to home and vice versus.

Luxford et al. (2017) talked about parent involvement being a crucial aspect because they had “homework” activities that needed to be done at home coupled with what they were learning at school. Often times I do not have parents that are actively involved in their children’s education, therefore that would be problematic for my students. When the students had parents, who were actively involved and participating with the activities that were needed to be performed at home the researchers found a change across settings in regards to anxiety reduction. However, the researchers did not see an improvement on social competency, attentional control, or attentional biases to threat with these adolescents.

Like Luxford et al. (2017), Sung et al. (2011) also looked at participants who participated in a CBT program that were given homework in attempt to get them to generalize their newly learned tools into more than one setting. This is a similar goal that classroom teachers have, teachers want their students to be able to take what has been taught to them and generalize it across settings in order for it to be an effective coping tool. Therefore, it would seem that the most effective CBT programs have homework that the participants can use so that they are not learning skills that they can

only apply in one environment, but in fact generalize and synthesize to multiple environmental settings.

After reading what van Steensel et al. (2017) researched it makes me believe we need to flip our mindset in the school setting. We talk about servicing our students as a whole but in reality, often times teachers think they can only control what is being taught in their classroom. While this is true, we may need to start servicing our students in a way that helps them to fully understand their environmental and family dynamic factors. We can teach them how that relates to their ability to function and how they can generalize their coping strategies across environments. While we cannot change where are students come from we can address coping strategies and replacement behaviors that they can use to combat their negative home environments. With that said, not all students come from negative home environments therefore, we can help our students by sharing our knowledge and our skill sets with their families in order to make a more cohesive progression in their growth in regards to CBT and the lasting effectiveness it can have on their lives.

Sizoo et al. (2017) looked at mindfulness (MBSR) and CBT comparing their effectiveness in adults. We have an entire mindfulness curriculum at my school in order to help our students become more aware of their thoughts and how those thoughts are affecting them in the moment. It is very interesting to me that the research Sizoo et al. (2017) did seemed to conclude that coupled together MBSR and CBT may have an even greater impact on our youth. I can see how MSBR would be helpful for my students as they often have irrational thought patterns simply because of their age and where they

are developmentally. Mindfulness, coupled with CBT in my classroom could have an even greater impact on a lasting change that will see my students through to adulthood.

Factor et al. (2017) noted that their findings showed significant impairment associated with ASD and co-morbid anxiety or ADHD. Considering most educators have students with ASD in their classrooms that have co-occurring ASD, anxiety, and ADHD these findings can help shape their classroom structures. When combining CBT and social skills training, the research would suggest that these two therapy/treatment plans would be the optimal design without adding pharmacological influences. As educators who cannot access nor add pharmacological factors to their lesson planning it is very important that classrooms for students with ASD are setup so that they can achieve the highest level of success while they are there. Having structured CBT and social skill training interwoven into the very dynamics of a classroom seem to suggest the most conducive environment for learners with ASD and comorbid anxiety/ADHD.

### **Conclusion**

After researching heightened anxiety in youth with ASD and the cognitive behavioral therapies that work with that population it can be concluded that educators need to be aware of what anxiety looks like in students with ASD in order to help reduce stressors and other factors that may contribute to their anxiety. Educators should be implementing continued use of social skills training and CBT strategies with the mindset that social situations can cause students with ASD heightened anxiety and escalate their related symptoms and behaviors. Effective social skills training combined with CBT

should help to lessen the anxiety related symptoms in students with ASD in regards to their social anxiety.

Educators may understand from this research why it is so important to keep a mindful approach to how they structure their classroom environment. Classroom environments should be structured with routine and consistency. The more structured and routine oriented an ASD classroom is, the stronger possibility that the students with in that classroom will thrive and have reduced anxiety related symptoms. Classrooms that access structured based teaching while implementing CBT strategies will help to alleviate some of their students' anxiety related symptoms simply by how the classroom has intentionally been designed to run.



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