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Types of anxiety diagnosed in individuals with autism spectrum disorder

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TYPES OF ANXIETY DIAGNOSED IN INDIVIDUALS WITH AUTISM SPECTRUM DISORDER

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Abstract

This literature review unravels comorbidities that accompany Autism Spectrum Disorders (ASD), specifically the various types of anxiety observed in children and adolescents at school, in their home lives, and in the community. This review explores what is known about anxiety in individuals with ASD; considers the presentation and impact of anxiety in various environments; and discusses practices, strategies, and tools that will allow educators and parents to identify and provide strategies to reduce anxiety for individuals with ASD. Anxiety and ASD characteristics are similar making differentiation challenging. As a result, anxiety disorders in individuals with ASD are often underdiagnosed. This review reveals differentiating factors and similarities between anxiety and ASD.

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CHAPTER I: INTRODUCTION

According to the Centers for Disease Control and Prevention (CDC) (2023), an estimated 1 out of 39 children in the United States are diagnosed with Autism Spectrum Disorder (ASD). ASD is a neurodevelopmental disorder that impacts millions of individuals. Autism impact social interaction, communication, and manifests in restrictive and repetitive behaviors. There is not a one size fits all treatment for individuals with ASD. This is partly because the disorder presents differently from one person to the next; some individuals with ASD struggle with restrictive repetitive behaviors (RRBs) and others with social communication and interaction deficits. It is truly a spectrum with symptoms of the disorder varying from mild to severe. Autism has become a significant health concern around the world particularly because the cause remains unknown. Scientists have not determined one single cause of autism, however, both genetics and environmental factors are thought to play a role. There is no cure for ASD but early detection and intervention are linked to greatly subsiding symptoms in some individuals. Children with ASD can be diagnosed as young as 18 months, though most are not diagnosed until age four.

ASD can have many comorbidities, or other medical conditions accompanying the diagnosis. Some frequent comorbidities include mood disorders, anxiety disorders, obsessive-compulsive disorders (OCD), attention deficit hyperactivity disorder (ADHD), gastrointestinal symptoms (GI), Tourette's Syndrome, or sleep disorders. This literature review seeks to differentiate between specific anxiety disorders and ASD. Anxiety symptoms can sometimes be overlooked by the typical characteristics of ASD.

My interest in supporting individuals with disabilities, particularly ASD, started at a young age. I grew up with a cousin and another close family friend both of whom were

diagnosed with autism. Although I did not understand the intricacies of their disability when we were young, I am able to look back and reflect about how different they are from one another. From my perspective as a young child, my cousin seemed to be a typical boy. On the other hand, I knew that my family friend was different from me. This was because they were on different ends of the autism spectrum. As we grew up, my cousin became quieter, avoided social situations and eye contact, and was fascinated with organizing and lining up his Major League Baseball collection cards. He struggled to make friends and did not do well in school. On the other hand, my family friend was and remains very outgoing, loves to hug and touch a shoulder when having a conversation, and is obsessed with running marathons, visiting zoos, and photography. He will make a full PowerPoint presentation for every single zoo that he has visited throughout the world. Today both individuals hold jobs working in retail. My cousin lives independently in an apartment but my family friend will probably always live with others. One obstacle that prevents my family friend from living on his own is his anxiety. He exhibits anxiety when he is required to start something new and unfamiliar. He mapped out the driving route to work with his dad weeks in advance and practiced it before his first day on the job. These are a few of the unique characteristics of ASD that sparked my interest in learning more about the disability.

I took a non-traditional route to lead me to where I am today as a special education teacher. I started undergraduate school as a Psychology major and ultimately transitioned to and graduated with a Communication Studies degree with a concentration in Marketing. In the summer between my junior and senior years, I worked in marketing for an organization that provided services for adults with developmental disabilities. I loved the work I was doing but it

was interacting with the adults with disabilities I enjoyed so much more. Entering my senior year of college I considered teaching but figured it was too late to make a change. After graduation, I worked in health insurance for four years hoping to enter a career in marketing. I was stressed and unfulfilled. I ultimately made the decision to quit my job and re-enroll in college to focus on teaching while working as a paraprofessional. My hope is to one day use my business background and experience with individuals with disabilities to open a sensory gym for individuals who have sensory and social sensitivities.

Throughout my career working as a special education paraprofessional and special education teacher, I have had the privilege of working with children and adolescents diagnosed with all types of disabilities. I have spent most of my time teaching, working with individuals who have ASD. I have always been fascinated by how ASD can present so differently for each person as described previously with my cousin and family friend. In the workplace, I had a student whose entire day was thrown off by a change in his bus route, a student who needed to touch the light switch five times before he could leave the classroom, and a student who was a selective mute. These are just a few examples of how ASD impacts individuals living with this disorder.

Individuals with ASD may have trouble navigating social situations due to not understanding the Theory of Mind (ToM), or how another person feels or what they are thinking. It can be challenging for individuals with ASD to understand that someone else's thoughts may be different from their own. Because of this, people with ASD feel stressed or anxious in social situations. It is essential to understand that individuals with ASD may handle stress and anxiety differently because of possible deficits in communication skills. Not being able to communicate

effectively can lead to unmet needs. For individuals with ASD, when their needs are unmet, it often leads to unwanted behaviors such as stimming (repetition of a particular physical movement). It can also lead to meltdowns which can be expressed verbally (i.e. shouting, screaming, crying), physically (i.e. kicking, punching, biting), or in both ways. Meltdowns can be directed towards others or self-injurious such as biting, scratching, picking, or head banging. Anxiety symptoms in children and adolescents with ASD significantly interfere with their ability to participate and be successful in the home, community, classroom, and employment.

The number of children diagnosed with ASD has dramatically increased in the United States over the past 20 years. It is not clear if this diagnostic increase is because the criteria changed to include a broader range of characteristics and distinct disorders, whether there is greater awareness of the condition, or possibly more professionals have been trained to diagnose ASD, along with related providers making more referrals. In the year 2000, an estimated 1:150 children were diagnosed with ASD. In just 10 years, that rate increased to an estimated 1:68 children diagnosed in the United States (Mazzone & Vitiello, 2016). Today, 1:36 individuals have ASD according to the CDC (2023). With more individuals diagnosed and living with ASD, there is a need for a deeper understanding of the disorder and the accompanying comorbid conditions.

This literature review will specifically consider the comorbidity of different types of anxiety. Anxiety can present in individuals with ASD due to their need for routine and consistency. If a familiar, expected routine is disrupted an individual with ASD may become anxious, leading to disruptive behaviors, agitation, or aggression. However, the anxiety can quickly disappear when the routine is resumed for some individuals. Determining the connection

between ASD and anxiety is important because anxiety can interfere with participation in the classroom, at home, and in the community for individuals with ASD (Mazzone & Vitiello, 2016). Anxiety can also impact the quality of a person's life and well-being. Specific phobias, generalized anxiety disorder, separation anxiety disorder, obsessive-compulsive disorder, and social anxiety disorder are the most commonly associated anxiety disorders for people with ASD. There is a current lack of knowledge regarding the relationship between ASD and anxiety but more is being researched daily.

Anxiety diagnoses are among the most common mental health conditions in individuals with ASD and are a real struggle for the students I support daily. It can be difficult to differentiate between what is a symptom of ASD and what is a symptom of anxiety. Like autism, anxiety presents in a variety of ways. Anxiety can cause physical responses, such as shaking or elevating the heart rate; can cause a behavioral response, causing individuals to act out or avoid situations altogether. According to the Mayo Clinic (2018), many neuro-typical individuals will experience situational anxiety in their lifetime. This may accompany big changes or pressure like the first day of school, giving a speech in front of a large group of people, or experiencing health concerns. For many others, the feelings of frequent and excessive anxiety, fear, terror, or panic are part of everyday situations and affect the quality of their life.

Published research on anxiety and autism found that almost 40 percent of children with autism and 50 percent of adults with autism experience some sort of anxiety disorder (van Steensel, Bögels & Perrin, 2011). Explanations for the increased risk of anxiety in individuals with ASD continue to be researched. This literature review will examine ASD and anxiety to determine how they are connected. It is important to differentiate between the two conditions to

formulate appropriate treatment plans and provide targeted services for individuals who struggle daily.

CHAPTER II: LITERATURE REVIEW

Research Question and Process

In order to review the published research studies applicable to the essential questions, searches were conducted using online databases to find related literature on anxiety and autism. The online searches included the words “anxiety,” and “autism spectrum disorders/ASD” in combination with the words “comorbidity/comorbidities,” “anxiety/anxiety disorders,” “anxious,” “classroom,” “school,” “symptoms,” and “treatment”. Of the articles found using the keywords, the abstracts were reviewed for relevance related to the essential questions. An abstract was considered if it described ASD and if an anxiety measure was included. Initially, there were over 50 articles, of which 30 met the criteria that included a peer-reviewed journal related to anxiety and autism. This thesis will review the literature found linking ASD to anxiety.

Prevalence and Symptoms of ASD and Anxiety

Many individuals diagnosed with ASD also have comorbid illnesses, or other medical conditions accompanying the diagnosis. ASD is characterized by varying degrees of communication impairment, social interaction deficits, and stereotyped interests and behaviors. Anxiety is also viewed as being inherent to ASD. Research shows that children with ASD are at an increased risk for anxiety and anxiety disorders. It can be difficult to differentiate between some ASD symptoms and anxiety due to their similarities (van Steensel, Bögels & Perrin, 2011).

There have been many studies that have confirmed children and adolescents with ASD are at an increased risk of anxiety. However, it is less clear what specific anxiety disorders occur most frequently in this population. A study by van Steensel, Bögels, and Perrin (2011) used meta-analytic techniques to clarify which specific anxiety disorders occured most in individuals

with ASD. A systematic literature review identified 31 studies involving 2,121 participants (aged <18 years) with ASD. The presence of anxiety disorders was assessed using standardized questionnaires or diagnostic interviews. The study confirmed that nearly 40 percent of children and adolescents with ASD also had clinically elevated levels of anxiety or at least one anxiety disorder. The study intended to estimate the prevalence of anxiety in children with ASD. In addition, researchers intended to evaluate whether the observed variability in anxiety rates was the result of ASD subtype, age, IQ, or method of assessment. Of the 40 percent of individuals with ASD who also had anxiety disorders researchers determined that specific phobia was the most common disorder at 30 percent, OCD in 17 percent, social anxiety disorder and agoraphobia in 17 percent, generalized anxiety disorder in 15 percent, separation anxiety disorder in nine percent and panic disorder in two percent. According to the study, the rates compare to typically developing children where an estimated 2.2-27 percent are diagnosed with anxiety disorders. Children and adolescents with ASD are nearly twice as likely to have a type of anxiety disorder compared to typically developing children.

As determined by van Steensel et al. (2011), the results suggest that children and adolescents from a specific ASD subtype could be more likely to develop a specific type of anxiety disorder. The ASD subtypes are similar to typically developing children but the severity of communication, social interaction, and behaviors varies due to the ASD. The study suggested that the severity of each autism domain was rarely reported. Further research should focus on the severity of the ASD domains and whether the rates of particular anxiety disorders varied as a function of the ASD severity.

According to Magiati et al. (2016), anxiety-related diagnoses were among the most common mental health conditions in individuals with ASD. This study examined gender, age, and adaptive functioning level in individuals with ASD and their reported anxiety symptoms. In the study, caregivers reported the anxiety symptoms of 241 children with ASD. The study predicted that age and adaptive functioning positively correlated with anxiety symptoms.

For this study, caregivers completed the following assessments: Spence Children's Anxiety Scale-Parent (SCAS-P), Developmental Behaviour Checklist, Parent Version (DBC-P), Second Edition, and the Scales of Independent Behavior-Revised (SIB-R). The study found no link between gender and overall anxiety. There was a positive association between age and the SCAS-P OCD symptoms. Adaptive functioning was positively correlated with SCAS-P social phobia and negatively with panic/agoraphobia and the DBC anxiety scores. Social/communication autism scores were positively correlated with SCAS-P Total, DBC Anxiety, SCAS-P Panic, and OCD subscales. The DBC repetitive speech/behavior score was positively correlated with all anxiety total and subscale scores except social phobia and physical injury (Magiati et al., 2016).

It can be concluded from the Magiati et al. (2016) study that characteristics such as age and gender may impact different anxiety subtypes, rather than overall anxiety symptoms. The DBC repetitive speech/stereotyped behavior was the most strongly predictive of all anxiety total scores. The results from the study concluded that there was a positive relationship between anxiety and the severity of autism. The data illustrated that 25 percent of the participants from the study presented clinically elevated anxiety symptoms (Magiati et al., 2016).

Settipani et al. (2012) studied the differences in clinical characteristics of anxious youth with and without symptoms of ASD. The symptoms of anxiety that best distinguished between these groups were examined. Research suggested that ASD and anxiety often co-occured. As many as 62 percent of children with mood or anxiety disorders showed elevated ASD traits. Many studies suggested that anxiety symptoms were more pronounced in children with milder forms of ASD. The Settipani et al. (2012) study explored the characteristics and symptoms of anxious youth with ASD traits. Researchers also explored the clinical diagnoses, severity of symptoms of depression, and coping ability of children with and without elevated ASD symptoms. The participants in the study were 100 youth (aged 7-16) who presented for treatment at an anxiety outpatient clinic or participated in a randomized clinical trial for cognitive behavioral therapy (CBT). The participants had met the criteria for diagnoses of generalized anxiety disorder (GAD), social phobia, separation anxiety (SAD), or specific phobia. The study included interviews administered to parents and children that assessed the DSM-5 anxiety disorders in youth. The interviewers provided clinical severity ratings (CSRs) for each diagnosis on a scale of 0-8.

Results indicated that anxious youth with elevated ASD symptoms had more anxiety diagnoses and were more likely to meet the criteria for social phobia than youth without elevated ASD symptoms. The study concluded that no significant differences were found between youth with or without elevated ASD symptoms based on age, sex, race, parental education, or socioeconomic status. However, youth with elevated ASD symptoms had significantly more diagnoses than youth without elevated ASD symptoms. The individuals with elevated ASD symptoms were more likely to meet the criteria for social phobia. Children with ASD symptoms

were not more likely to have multiple anxiety disorders or diagnosed with GAD, SAD, panic disorder, OCD, ADHD, a specific phobia, or a mood disorder. Youth with elevated ASD symptoms were more likely to list social concerns as a top three fear (Settipani et al., 2012).

Based on the results of the Settipani et al. (2012) study, the diagnoses and presentations of individuals with ASD symptoms resemble those of individuals without elevated ASD symptoms. The exception to the similarity were the children with elevated ASD symptoms who had more diagnoses and were more likely to meet the criteria for social phobia. Additionally, individuals with elevated ASD symptoms were likely to list social concerns as one of their top fears. The study found that 42 percent of youth who presented for treatment of anxiety disorders demonstrated clinically relevant levels of ASD symptoms. It was also found that youth who presented with ASD symptoms and an anxiety disorder tended to be higher functioning, without any severe cognitive impairments. Therefore, these individuals may have had a better understanding of their social skills deficits compared to the broader ASD population. The results were consistent with previous research (Settipani et al., 2012).

Ben-Itzchak, Koller, & Zachor (2020) aimed to examine the frequency of elevated anxiety symptoms in adolescents with diagnosed ASD based on information from their toddlerhood, to explore the impact of comorbid anxiety in adolescents, and to evaluate variables in toddlerhood associated with the severity of anxiety symptoms in adolescence. The study included 61 adolescent participants all diagnosed with ASD as toddlers. Information was gathered via a structured interview administered to the parents of the participants. The prevalent anxiety subtypes examined were separation, social, and generalized anxiety. The review studied characteristics in individuals with ASD associated with the severity of anxiety symptoms in

adolescence. According to the study, the specific type of elevated anxiety symptoms in toddlerhood was associated with individual cognitive ability, adaptive skills, and restrictive repetitive behaviors (RRBs) in adolescence.

Previous studies reported that increased levels of inhibition in preschool years, a history of maternal anxiety disorders, and parenting profiles with high levels of over-involvement were strong indicators for children who developed anxiety disorders. Understanding factors that could place a child with ASD at risk for developing anxiety could provide important information for early identification, intervention, and prevention. The long-term study followed a group of children with ASD from when they were toddlers through adolescence. The study focused on significant anxiety symptoms in children and adolescents, the frequency of different anxiety subtypes, and factors in toddlers that predicted the development of anxiety (Ben-Itzchak et al., 2020).

According to Ben-Itzchak et al. (2020), 55.7 percent of the 61 participants with ASD were diagnosed with at least one specific anxiety disorder. Separation anxiety was the most prevalent type of anxiety (subdomain at 39.3 percent), followed by social anxiety (27.9 percent), and generalized anxiety (18 percent). Previous studies described similar findings for the rate of anxiety disorders in children and adolescents with ASD (Ezell et al., 2019; White et al., 2014). The current study also found that anxiety disorders in children with ASD existed independently of other clinical characteristics and were distinct from autistic symptomatology. The authors concluded that more severe generalized anxiety disorder symptoms were linked with the increased severity of ASD and higher cognitive ability. Additionally, elevated social anxiety was linked to less severe RRBs. According to the study results, “lower cognitive abilities in

toddlerhood were associated with and predictive of future increased symptoms of separation anxiety," (Ben-Itzchak et al., 1245). On the other hand, the study found that higher cognitive abilities were linked to future increased generalized anxiety symptoms.

Spain et al. (2018), noted that social anxiety was implicated as a common comorbid condition to ASD. The systematic review of existing data highlighted the relationship between core symptoms of ASD and social anxiety. Researchers reviewed 24 cross-sectional studies and examined the association between ASD and social anxiety. The purpose of the review was to determine whether empirical data supported an association between ASD and social anxiety symptoms.

A trend in the data reviewed the significant correlations indicated between ASD and social anxiety symptoms when individuals rated themselves, however, this was not the case identified by parent ratings. A review of the 24 studies showed a significant relationship between elevated levels of social anxiety and poor social skills and social understanding (Spain et al., 2018).

Spain et al. (2018) summarized the systematic review noting that social anxiety in individuals with ASD was associated with poor social skills and functioning, and reduced social motivation. Correlations between self-reported social anxiety and ASD measures were noted, but significant relationships were found with parent ratings of these symptoms. Data from the evidence reviewed found that social anxiety symptoms were not directly correlated to RRBs or sensory sensitivities. The findings supported the idea linking core ASD symptoms and social anxiety (Spain et al., 2018).

Research shows that individuals with ASD are more vulnerable to anxiety. Repetitive, restricted behaviors (RRBs) are a core feature of ASD but can also be associated with anxiety. Rodgers et al. (2012), examined RRBs and anxiety for two different groups of children with ASD; those with high anxiety and those with lower anxiety. Participants were 67 young people with ASD between the ages of 8 and 16. The Spence Children's Anxiety Scale-Parent Version (SCAS-P) was used to assess anxiety symptoms. The scale used a 38-item parent report questionnaire which provides a total anxiety score and six subscale scores (panic, separation anxiety, social phobia, obsessive–compulsive disorder (OCD), generalized anxiety disorder (GAD), and physical injury fears). The Repetitive Behaviours Questionnaire (RBQ) was used to assess RRBs and included a 33-item questionnaire. For the RBQ, a higher score indicated more severe or frequent RRBs. Behaviors examined include repetitive movements, sameness behavior, repetitive use of language, and circumscribed interests (Rodgers et al., 2012).

The results determined that those with higher anxiety also had more RRBs. The participants in the group with high anxiety were reported by parents to have higher levels of total RRBs, sameness behaviors, circumscribed interests, and sensory-motor behaviors than the participants with low anxiety. Additionally, high levels of insistence on sameness were associated with elevated levels of anxiety in the anxious group only and no significant correlates were found between anxiety and RRBs in the non-anxious group (Rodgers et al., 2012).

Hallett et al. (2013), explored the measurement and manifestation of anxiety in children with ASD. Participants consisted of 415 children with ASD based on a parent-rated DSM-5-referenced anxiety scale. High and low-functioning children with ASD were assessed. The common anxiety symptoms assessed included restlessness, tension, and sleep disturbances.

The study concluded that higher anxiety in autism was associated with functional language, an IQ over 70, and higher scores on behavioral measurements. Underlying anxiety disorders that emerged were: generalized anxiety, separation anxiety, social anxiety, and over-arousal.

High scores on the anxiety rating scale were associated with being verbal, having an IQ of 70 or above, and using high levels of inappropriate speech, irritability, and hyperactivity. Children whose parents rated ASD severity as higher had the highest anxiety levels as documented in the study. The study results suggested that a combination of a higher IQ and more severe behavioral problems could pose a greater risk of developing anxiety disorders. Further investigation was recommended as the behavioral problems of irritability, ASD severity, and hyperactivity were often linked to subjects who had a lower IQ (Hallett et al., 2013).

Chang, Quan & Wood (2012) examined several types of anxiety disorders and their correlation to social functioning deficits in children and adolescents with ASD. The study included 54 children with ASD who also met the criteria for at least one anxiety disorder with social anxiety as the most common diagnosis. Researchers investigated how anxiety affected social functioning in the ASD population by examining the following: whether a greater severity of anxiety disorders predicted lower social functioning, if social anxiety symptoms influenced social functioning versus the impact of other anxiety disorders (Chang et al., 2012).

All of the children in the study had ASD and qualified for at least one anxiety disorder including social anxiety, separation anxiety, generalized anxiety disorder, and obsessive-compulsive disorder. Social functioning was measured using the Social Skills Rating System (SSRS) which assessed participant cooperation, assertion, responsibility, and self-control using a 3-point Likert scale that tallied participant responses (Chang et al., 2012).

The study revealed that more severe social anxiety was associated with greater social functioning deficits for the population assessed. Specifically, the research indicated that social anxiety could produce barriers to social engagement and become a risk factor for more social deficits in individuals with ASD. As rated by the parents of the participants, the severity of social anxiety predicted lower social functioning. It was determined that higher levels of social anxiety predicted lower assertive and responsible social skills. The findings from the study suggested that social anxiety may be more impairing to social functioning in children with ASD than other anxiety disorders (Chang et al., 2012).

Llanes, Stavropoulos & Eisenhower (2018) reported ADHD symptoms and anxiety for children with ASD based on data from a study that included parents and teachers of 180 preschool and school-aged children. Parents and teachers used a Child Behavior Checklist to measure ADHD symptoms and anxiety in children with ASD (Llanes et al., 2018).

The results of the study concluded that parents reported elevated anxiety symptoms in 31 percent of preschool children and 50 percent of school-aged children. Conversely, teachers reported elevated anxiety levels in five percent of preschool children and 30 percent of school-aged children. The study also concluded that parents reported elevated ADHD symptoms in 22 percent of preschool children and 45 percent of school-aged children. Teachers reported elevated ADHD symptoms in 20 percent of preschool children and 24 percent of school-aged children. Overall, there was not much consistency between parents and teachers. Teachers reported fewer problems overall between anxiety and ADHD symptoms (Llanes et al., 2018)

The study provided an analysis of ADHD and anxiety symptoms in children with ASD. Parents and teachers reported that ADHD and anxiety symptoms were more prevalent for

school-aged children when compared to preschool children. Children who had elevated scores for ADHD symptoms were reported to have inattention, hyperactivity, and impulsivity. Teachers were less likely to report behavior problems when compared to parents, specifically in preschool children with anxiety. The low consistency between parent and teacher reports is consistent with previous research (Llanes et al., 2018).

Neil, Olsson & Pellicano (2016), examined intolerance of uncertainty, sensory sensitivities, and anxiety were examined in groups of children with and without ASD. The study reviewed parental reports in 64 children with autism and 85 typically developing children aged 6-14 by examining the between-group and within-group differences in all three variables. The primary caregiver for all selected children completed three questionnaire measures for the study. The group differences were examined using parent responses to the Intolerance of Uncertainty scale, Short Sensory Profile, and the Spence Children's Anxiety scale. The results showed that scores for typically developing children on the Short Sensory Profile and Intolerance of Uncertainty scale produced a negative skew. All scores followed a normal distribution in both groups of children. Parents of children with ASD reported greater intolerance of uncertainty, anxiety, and sensory sensitivities when compared to typically developing children The study showed that intolerance of uncertainty explained approximately half the variance in children with ASD and their sensory sensitivity scores. Intolerance of uncertainty explained one-third less of the variance in typically developing children's sensory sensitivities (Neil, Olsson & Pellicano 2016). There was a strong positive association between intolerance of uncertainty, anxiety, and sensory sensitivities in the population of children with ASD that was assessed.

Syriopoulou-Delli et al. (2019) investigated teacher perceptions about anxiety in school children with ASD to determine differences in anxiety severity between students with and without ASD, and to make recommendations for managing anxiety. General and special education teachers (118 and 291) completed the Scale Teacher Response (SAS-TR) questionnaire. The teachers provided data about students in their classroom with and without ASD.

The SAS-TR questionnaire results found that 46.8 percent of students with ASD presented clinical anxiety levels compared to 15.3 percent of typically developing students. Gender and age were not correlated to the anxiety scores. The study found that higher IQ was weakly correlated with a higher anxiety level in children with ASD and better verbal skills were strongly correlated with higher anxiety levels in children with ASD (Syriopoulou-Delli et al., 2019).

The main purpose of the study was to identify the anxiety levels experienced by children with ASD in school. The SAS-TR results revealed that 44% of children with ASD showed typical anxiety levels. The SAS-TR results also revealed that 79.7 percent of typically developing children showed normal anxiety levels in the school environment. While children with ASD had higher levels of anxiety than the general population, higher IQ levels in ASD children were weakly associated with higher levels of stress in school The association was stronger for verbal skills in children with ASD who had well-developed speech and in turn showed higher levels of anxiety (Syriopoulou-Delli et al., 2019).

Adams et al. (2019) conducted a systematic review of anxiety in children with ASD in school with 32 research papers included in the review. The study aimed to determine which

studies reported anxiety in children with ASD in a school setting, which measures reported anxiety levels for children with ASD in school, and whether there was a correlation between the scores on teacher measures of anxiety compared to children and their parents reported. The majority of studies were descriptive, non-experimental studies, with the remaining six being intervention studies. Three intervention studies were school-based Cognitive Behavioral Therapy (CBT).

The findings from the study indicated very limited research relating to anxiety in individuals with ASD within academic settings. Of the articles reviewed, several important findings emerged. Teachers reported higher mean scores on anxiety subscales for children with ASD than children without ASD. Additionally, the research found that the use of teacher data did not provide consistent outcomes regarding agreement or differences from parent-reported levels of anxiety. Six papers reviewed correlated to parent and teacher data. Half of those papers reported a positive correlation and the other half reported no correlation. There were no reported differences between parent and teacher scores found in the three papers. Pre to post-intervention scores were inconsistent as reported by both parents and teachers (Adams et al., 2019).

Overall, limited research resulted from this study that described anxiety in ASD students in a school setting. Despite the limited number of studies that exist and of those reviewed, there were essential findings that emerged. The first important finding was that teachers reported higher mean scores on anxiety subscales for children with autism than for children without autism. Another critical finding determined that the use of teacher data across the studies was inconsistent with the outcomes in terms of parent-reported levels of anxiety. There were also inconsistent changes in parent and teacher scores from pre to post-intervention. It was

determined that due to the inconsistencies it could not be assumed that anxiety ratings would be similar across different contexts or settings. The study concluded that future research will be strengthened by collecting data from multiple informants. Additional research should focus on the differences in how anxiety in children with ASD presents at school and what impact that has on academic engagement and achievement. The study also concluded that further development focused on teacher reporting and self-reporting methods is needed (Adams et al., 2019).

Magiati et al. (2016), examined gender, age, adaptive functioning, and the severity of autism symptoms with anxiety symptoms. The participants in the study consisted of 241 caregivers of children six to 18 years old with ASD who attended schools in Singapore. The study used the Spence Children's Anxiety Scale (SCAS-P) to assess emotional, behavioral, and adaptive functioning (Magiati et al., 2016).

The results from the study were compared with Australian/Dutch SCAS-P scores. Overall, the sample scores from the Magiati et al. (2016) study were greater for separation anxiety, panic/agoraphobia, physical injury and OCD, and total anxiety symptoms. The study found 25% of participants presented with clinically elevated anxiety. The information found from this study was consistent with previous studies of anxiety and ASD from Western countries (Van Steensel et al., 2011; White et al., 2009). The sample from Magiati et al. (2016) showed fewer social phobia symptoms compared to previous research. This could be explained because the children in the Magiati et al. (2016) study attended a special school intended to create an environment that reduced social pressure and anxiety.

Caregivers reported increased anxiety, less social anxiety, and no gender differences compared to the SCAS-P Australian/Dutch norms. Repetitive speech/behavior severity was a

significant predictor of separation anxiety, generalized anxiety, panic/agoraphobia, and OCD symptoms, but not a predictor of social phobia and fear of physical injury. Social phobia and generalized anxiety symptoms were predicted by adaptive functioning and chronological age. The severity of social/communication ASD symptoms did not explain anxiety symptoms when other variables were controlled (Magiati et al., 2016).

Carruthers et al. (2018) considered the psychometric properties of the Spence Children's Anxiety Scale (SCAS) child and parent reports and the Screen for Anxiety Related Disorder-71 (SCARED-71. The participants consisted of 49 males with ASD who were 10-16 years old and 63% had a co-occurring anxiety disorder. Researchers determined that both scales were consistently reliable with fair-good parent and child agreement.

Carruthers et al. (2018) was the first to compare both parent and child versions of the most commonly used anxiety questionnaires. The results concluded that individuals who had one anxiety diagnosis scored higher on both parent and child reports for both questionnaires. High correlations between the relative parent and child reports suggested consistency across the use of different tools. Previous studies suggested that behaviors observed by parents tended to have higher parent-child agreement. This could be desirable for the ASD population because young children with ASD are typically more likely to have difficulty verbalizing their experiences.

In this study, levels of autism severity, but not IQ or behavioral difficulties, were associated with an anxiety diagnosis. The SCAS and SCARED-71 measures both showed consistency in parent-child responses. The SCAS had a higher proportion of observable behavior. Both measures were determined as appropriate for use with the ASD population due to acceptable levels of validity. There could be a risk of underestimating the severity of anxiety in

the ASD population so continued development is needed for diagnostic tools that accurately measure anxiety in the ASD population accurately (Carruthers et al., 2018).

Howe & Stag (2016) used the Adolescent/Adult Sensory Profile (AASP) and a qualitative questionnaire to investigate sensory issues in school-aged children with ASD. The participants indicated difficulties in at least one of the sensory domains assessed, with hearing being the most affected. The results also showed that sensory sensitivities affected learning for the ASD individuals (Howe & Stag, 2016).

In accordance with previous research, Howe & Stag (2016) found that all participants showed processing difficulties in at least one sensory domain. The study found that 86% of participants scored outside of the normal range on two or more of the sensory profile quadrants. The individuals who participated in the study were aware of their own sensory issues and all indicated having difficulties in the classroom with at least one sensory domain. The participants noted that hearing was rated as the sense most affected followed by touch, smell, and vision. The participants also reported that sensory sensitivities impacted their learning. Participant classroom difficulties caused by sensory sensitivities were found in the areas of concentration, anxiety, and discomfort (Howe & Stag 2016).

The study revealed that the anxiety produced by such sensory sensitivities was a source of distress for the participants. Previous research confirmed that anxiety in children with ASD was higher than in children without ASD. The study suggested that reducing sensory issues could be connected to reduced anxiety levels in a school environment for children with ASD. Teachers' awareness of stimuli that caused distress in individuals with ASD can be one way to alleviate stress and anxiety about sensory sensitivities (Howe & Stag, 2016).

In a 2014 study, Kerns et al. assessed traditional and atypical anxiety based on the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) definitions of (Autism Spectrum Disorder) ASD. The study consisted of 59 participants ages 7-17 with identified ASD. Parents of the participants completed interviews and parent reports. The study showed that 17% of the participants presented with traditional anxiety, 15% presented with atypical anxiety, and 31% with both. The traditional anxiety predictors consisted of participant language ability, anxious cognitions, and hypersensitivity whereas traditional anxiety and ASD symptoms predicted atypical anxiety. The study found that youth with ASD expressed anxiety in similar and dissimilar ways to the DSM-5 definition.

Results from the study indicated that the presence of traditional anxiety disorders resembled anxiety as it presented in typically developing children and was independent of the severity of ASD. The study found that negative automatic thoughts were associated with anxiety in children with ASD. Hypersensitivity was also found to be associated with increased anxiety in children and adolescents with and without ASD. Intellectual ability was not associated with traditional anxiety. The study considered that the association between IQ and anxiety resulted from the communication abilities of higher-functioning participants (Kerns et al., 2014).

The study also showed that youth with ASD had different levels of anxiety related to challenges faced by individuals with ASD. Complicating the diagnosis, anxiety-like behaviors can arise in individuals with ASD who may not meet the DSM anxiety criteria. Findings suggested that atypical symptoms of anxiety were independently associated with more ASD symptomatology, traditional anxiety symptoms, and anxious automatic thoughts. Similarities

supported the presence of comorbid anxiety and the dissimilarities required further examination (Kerns et al., 2014).

Mayes et al. (2013) assessed 1033 children with autism regarding unusual fears, a frequent symptom of anxiety or specific phobia. The sample showed that unusual fears were reported by 421 parents of children with ASD (41% of participants). Many other participants had common childhood fears such as dogs, bugs, the dark, etc. The study found that more than half the participants with unusual fears had fears of mechanical objects, heights, and the weather.

Results from the study found that unusual fears were reported in 421 of the 1033 participants with ASD. For 89 participants, the results indicated that unusual fears were present but researchers did not record specific fears. For the remaining participants, a total of 487 unusual fears were reported. The most common fear was toilets, accounting for 11.7% of the unusual fears. The most common category was fear of mechanical objects, accounting for 23.8% of fears reported (Mayes et al., 2013).

The study revealed that more than half of the children with ASD had significant fears or phobias, including 41% of participants having unusual fears. Examples from the study included children who would not leave the house if the weather was bad, if there was a squirrel in the yard, or if they heard crickets. Unusual fears and common phobias were present in most children with ASD and could impair functioning. Possible interventions include exposure, desensitization, modeling, shaping, and reinforcement for children with and without ASD (Mayes et al., 2013).

White et al. (2014) measured the metric and latent factor equivalence of anxiety using the Multidimensional Anxiety Scale for Children; parent-report (MASC-P) and child-report (MASC-C). The study focused on youth with anxiety disorders and ASD and a gender-matched

comparison group of typically developing children with anxiety but without ASD. Findings suggested that the MASC-C report may not have accurately measured identical constructs in anxious children with and without ASD.

The results of the MASC-P showed that child participants did not differ in age, gender, or Verbal IQ. The study also found that the overall MASC-P total score revealed a small to medium inter-item correlation between ASD and typically developing children. In the sample of ASD children, the MASC-C data established latent factors (factors that could only be identified by a mathematical model, and not necessarily be observed) (White et al., 2014).

There was reasonable correspondence between the two groups in terms of clusters of interrelated items that represented separation anxiety, panic symptoms, physical anxiety symptoms, social anxiety symptoms, and harm avoidance symptoms. The information revealed that a similar structure of subscales was replicable in both the group with ASD and typically developing children at a broad level and the same latent factors emerged in the ASD group. Children with ASD sometimes experienced anxiety differently than their typically developing peers. Although many of the same factors were present, they did not correlate in the same way as seen in typically developing children without ASD. Continued research is needed to comprehend what mechanisms correspond to factor equivalence (White et al., 2014).

Treatments and Classroom Strategies

In a 2014 study by Laugeson et al. (2014), researchers explored social skills training as a treatment for adolescents with ASD, specifically in the classroom. The study reviewed the implementation of a school-based, teacher-facilitated social skills intervention called the Program for the Education and Enrichment of Relational Skills (PEERS). PEERS is a social

skills class led by teachers for individuals with ASD that focuses on making and keeping friends and dealing with rejection and conflict with peers. The purpose of the study was to test the effectiveness of the school-based social skills intervention for individuals with ASD.

The study consisted of 73 middle school students with ASD including their parents and teachers. The study took place for 14 weeks. Participants were placed in the PEERS treatment group or an alternative social skills curriculum group. The study consisted of the PEERS group who received 30 minutes of lessons per day five days a week. Some of the skills addressed in the groups were appropriate use of eye contact and voice volume, initiating a conversation, getting along with others, and reciprocity during conversations (Laugeson et al., 2014).

The results from the study showed that the PEERS curriculum was effective at improving the social functioning skills of individuals with ASD. According to the study, individuals showed improvement in social responsiveness after participating in the PEERS curriculum. Improved areas consisted of social motivation, social awareness, social communication, and decreased autistic mannerisms. The results showed that participants self-reported increased frequency of hosted and invited get-togethers and improved social skills knowledge. According to the study, participants reported greater social engagement with peers through self-initiation and peer reciprocity (Laugeson et al., 2014).

The study results demonstrated treatment benefits for the understudied and underserved population. According to Laugeson et al. (2014), utilizing teachers as social skills interventionists increased opportunities for social coaching and teachable moments in a setting that is natural for adolescents with ASD. Utilizing this treatment will allow teachers to reach

several adolescents with ASD by aiding in learning the social etiquette that is needed to develop and maintain meaningful relationships (Laugeson et al. 2014).

Clarke et al. (2016) reviewed how Cognitive Behavioral Therapy (CBT) could provide a way for individuals with ASD to manage anxiety. The study consisted of a school-based CBT program. The Spence Children's Anxiety Scale and the Coping Scale for Children and Youth were utilized in the study. According to the research, CBT yielded positive effects for youth with anxiety. Additional research suggests that CBT also effectively treats children with autism who have anxiety.

The first hypothesis explored whether children with ASD who received the CBT at school demonstrated reduced anxiety levels compared to the control group. The results of the Spence Children's Anxiety Scale revealed that individuals in the experimental group exhibited reduced levels of anxiety compared to the control group. The findings from the parent and child reports suggested that the CBT program could help children with ASD and anxiety (Clarke et al., 2016).

The second hypothesis reviewed the process of change experienced by children. The study hypothesized that children in the experimental group would engage in fewer maladaptive coping strategies than the control group. The study found that individuals in the experimental group were less likely to engage in behavioral avoidance strategies and were more likely to engage in problem-solving strategies. During follow-up with participants, the children in the experimental group used less behavioral avoidance to cope in school and maintained their problem-solving coping strategies. Participants were also less likely to use cognitive avoidance strategies (Clarke et al., 2016).

According to the study, control and experimental group participants had similar autism severity and cognitive abilities. The total anxiety scores and coping behavior abilities were comparable. Information from the study suggested that changes in anxiety or coping measures were not influenced by the participant's cognitive ability or severity of autism. The study concluded that CBT was an effective way to help children with ASD manage anxiety (Clarke et al., 2016).

Rance et al. (2017), explored the connection between hearing deficits and high levels of stress and anxiety in children with ASD. The study consisted of 20 male and six female school-age students. Researchers hypothesized that hearing deficits could be improved by interventions that would also decrease levels of stress and anxiety. The study application used Ear-Level Remote Microphone devices and other classroom amplification systems. According to the study results, the devices created improved listening, communication, social interaction, and a reduction in stress levels for children with ASD (Rance et al., 2017).

The subjects were divided into groups A and B. Group A consisted of younger students (6-12 years) and group B consisted of older students (13-16 years). All 26 participants in the study were considered clinically anxious. According to the results, the participants with the poorest hearing ability initially showed the highest stress levels and therefore showed the greatest stress reduction because of auditory intervention. The study suggested that individuals with ASD are susceptible to higher levels of anxiety and stress when in social situations. According to the results, this was exacerbated by hearing impairments that heightened such stress. The stress could have been caused by fright that comes from sudden or unpleasant sounds (Rance et al., 2017).

Study A reported an aversion to loud noises from many everyday situations consisting of listening. The study suggested that exposure to everyday noises can impact individuals with ASD who have hearing difficulties, for whom greater focus on listening is required to understand speech. The study also found that hearing deficits in individuals with ASD increased the likelihood that they would misunderstand what was said to them and in turn produce increased social anxiety and communication breakdown (Rance et al., 2017).

According to the results of the study, the Ear-Level Remote Microphone system reduced listening-related stress for the participants. When the system was used, participants showed reduced cortisol responses over the course of a challenging listening session. The study revealed that 80 percent of the 8-12-year-old participant group were avid users of the listening device after the 6-week study, but none of the participants in the teenage group continued using the system at school for more than a few days. The study confirmed that the remote microphone auditory system reduced listening-related stress and anxiety in one-to-one and group settings (Rance et al., 2017).

McNally et al. (2012) explored the Coping Cat program as an effective strategy to reduce anxiety in children with ASD. The Coping Cat program is a form of cognitive behavioral therapy (CBT). CBT has been determined to be the treatment of choice for typically developing children with anxiety. Until this study was conducted, there were no previous studies that examined whether the Coping Cat program could be modified to reduce anxiety in children with ASD. The study included 22 children, ages 8-14, diagnosed with ASD and at least one primary anxiety disorder of separation anxiety disorder (SAD) generalized anxiety disorder (GAD), or social phobia (SP). Ten participants were assigned to 16 sessions of the Coping Cat program over a

16-week period and twelve participants were randomized to the waitlist. Accommodations were made to a standard CBT program to remediate the social and adaptive skill deficits of the participants with ASD that could have been barriers to reducing anxiety. The study incorporated individual treatment, parent training, and school consultation (McNally et al., 2012).

Information from the study noted that finding effective treatments for individuals with ASD and anxiety has been an area of recent interest due to the high rates of these co-occurring conditions. The study concluded that participants who received CBT had significantly larger reductions in anxiety compared to the waitlist individuals. The study confirmed that reductions in anxiety were maintained at a two-month follow-up visit. According to McNally et al. (2012), the results provided evidence that the Coping Cat program effectively reduced anxiety in children with ASD.

Based on the results from the study, over half (58%) of the participants in the CBT treatment group demonstrated remission of significant anxiety symptoms and no longer met diagnostic criteria for an anxiety disorder. According to the research, this finding was comparable to the same anxiety remission for typically developing children who also completed the Coping Cat program (McNally et al., 2012).

According to a study by White et al. (2012) anxiety in individuals with ASD may amplify the core social disability and thus make combined treatment approaches necessary. The pilot study consisted of a randomized controlled trial and evaluated the feasibility and preliminary outcomes of the Multimodal Anxiety and Social Skills Intervention (MASSI) program. The program consisted of 30 adolescents with ASD and anxiety symptoms of moderate to great severity.

The MASSI is a CBT program that targeted concurrent anxiety and social disability in individuals with ASD. The treatment included individual therapy, group social skills training, and parent coaching. This study was one of the first programs designed to intentionally target the anxiety and social deficits of ASD in individuals who are higher functioning. According to the study, higher-functioning individuals with ASD (defined as having an IQ above 70) were often more aware of their social deficits, which may heighten anxiety (White et al., 2012).

According to the results of the White et al. (2012) study, 25 out of the 30 participants completed the randomized trial; 13 of 15 completed the MASSI with 12 of 15 on the waitlist. The MASSI full treatment protocol included 12 individual therapy sessions and one additional session if requested by participants. There were seven additional specific social skills training sessions for everyone enrolled in the MASSI. According to parent reports after the program, scores ranged from 2 to 10 on a 1 (not helpful) to 10 (very helpful) scale with the mean being 8.21. Individual therapy was rated as the most helpful by parents. According to the participants, group therapy was the most helpful. Based on the results, nine of the 15 MASSI participants demonstrated reliable improvement whereas none of the 15 participants on the waitlist showed any significant change (White et al., 2012).

Nuske et al. (2018) explored the challenges of transitioning to a new school for students with ASD. The study also explored strategies used to support students and parents while transitioning schools. The review included 443 students with ASD across four continents including North America, Europe, Africa, and Australia. The students with ASD faced increased social pressure and anxiety. Their parents were overwhelmed regarding placement decisions, and teachers struggled to find appropriate support with limited resources. The findings of the study

indicated the most useful strategies involved helping students adjust to the new school, individualizing transition supports, clarifying the process for parents, and fostering communication (Nuske et al., 2018).

Changing schools places pressure on students and their families. There are school transition programs that are designed to mitigate these difficulties. However, the programs may not adequately address the various needs of students with ASD. The process becomes more difficult for students with ASD and their families because of difficulties with social communication, peer relationships, resistance to change, and uncertainty. Other concerns that appeared to spike during school transitions for students with ASD included sensory hypersensitivities, reactions to light and sound, anxiety, and sleep problems. The purpose of the study was to describe transition difficulties and find strategies to support better transitions for students, their families, and school staff (Nuske et al., 2018).

The study concluded that children with ASD, their families, and school staff had difficulty with the transitions to kindergarten and secondary school. According to parents, children who were transitioning to kindergarten experienced difficulties with anxiety, communication with peers and teachers, and adjusting to new routines. The study showed that students transitioning to secondary school faced challenges with mental health, sensory, behavior, academics, peer relationships, and social skills. Parents and teachers included in the study concluded that the students with ASD were challenged by changes in building locations, physical configurations, and everyday routines (Nuske et al., 2018).

Students, parents, and teachers in the study confirmed the different strategies that helped students with ASD adjust to learning in a new environment. These strategies consisted of

planning, visual supports, social supports, and self-regulation. Additional student strategies consisted of visiting the new school before the start of the school year, having schedules and timetables, having a peer buddy system, going to a safe person or space, and using coping strategies. The study indicated that visiting the school before the school year alleviated student anxiety by exposing them to the new environment and meeting the teacher. Useful parental strategies included information, communication, support, and advocacy. Teacher strategies included communication, planning, training/knowledge, placement, and preparing accommodations. According to the study, strategies that adjusted the student to the new setting, individualized transition supports, and fostered communication among the sending and receiving schools and between school and home were very useful (Nuske et al., 2018).

In a study by Kokina and Kern (2010), Social Stories were reviewed as an intervention for students with ASD. Social Stories use illustrations with simple words and depict various social scenarios intended to help individuals who have difficulties understanding social concepts. The stories may or may not include pictures and are presented to students before a potentially difficult situation or expectation of behavior during a transition. Social rules can be confusing and overwhelming to individuals with ASD and Social Stories help teach visually to ease confusion. It is thought that Social Stories intervention can lead to better social understanding to improve behavior and social functioning. Social Stories first became implemented as a way for individuals with ASD to aid in their social difficulties. People with ASD can develop experiences of loneliness, difficulty establishing and maintaining social relationships, and a range of mental health problems. Social Stories are short stories written with the goal of objectively sharing important social information with individuals with ASD.

Kokina, A., & Kern, L. (2010) determined that Social Stories promoted the understanding of social concepts but did not necessarily improve a student's social skills. The authors noted that Social Stories are a great first step to having individuals with ASD understand social expectations before they work on developing their own social skills.

A total of 18 studies about ASD and Social Stories were included in a meta-analysis to review the effectiveness of the intervention for students with ASD. The main intervention goals were to reduce inappropriate behavior and improve social skills. Other applications suggested using Social Stories to teach academic skills, assist students in novel events, and acknowledge students' achievements. Most of the studies were conducted in self-contained settings. According to Kokina & Kern (2010), "Social Stories seem to be a good fit for the general education environments due to their ease of implementation and a relative unconstructiveness." The results of this study concluded that Social Stories used in the general education classroom produced greater effectiveness in addressing student behaviors compared to implementing the same in self-contained classrooms.

The meta-analysis by Kokina & Kern (2010) concluded that studies that target children as their own intervention agents were more effective than those run by adults. This confirmed that it is possible that children who are capable of reading and monitoring their interventions are likely to be more successful in improving their understanding of social scenarios. The research found that intervention effectiveness was higher when Social Stories were used immediately before a situation occurred. Several of the studies reviewed only one Social Story per student. The studies that used several Social Stories per student demonstrated more effective changes in student behavior. Social Stories that used illustrations were more effective than those with only written

text. According to the meta-analysis by Kokina & Kern (2010), a combination of several factors was associated with increased effectiveness in using Social Story interventions, including reductions in inappropriate behaviors, implementation in the general education classroom, the use of students as intervention agents, Social Stories read immediately before a situation, Social Stories describing simple behaviors rather than complex ones, brief duration of the intervention, use of functional assessment, use of comprehension checks, participants who had higher levels of communication and social skills, and low or moderate levels of challenging behaviors.

O'Nions et al. (2017) reviewed strategies parents could implement to manage the problem behaviors of their children with ASD. This meta-analysis explored strategies parents could use to manage behaviors such as irritability, non-compliance, and anxiety. Researchers explored many approaches such as: accommodating the child, changing the environment, introducing structure and routine, supervision, including everyday tasks, response to problem behavior, managing distress, maintaining safety, and planning. The meta-analysis concluded that there were greater parenting demands for individuals who have children with ASD and challenging behavior.

The research found that parents of children with problem behaviors associated with ASD attempted to avoid directly challenging the behavior by adapting situations, demands, and requirements to suit the child. According to the study, parents who attempted to 'preserve the family unit' and conceded to adjust to suit the child were perceived as being the lesser of two evils. Other parenting strategies for challenging behavior in children with ASD consisted of consequences, time-out, and physical punishment. Parents from the study concluded that sticking to routines reduced the likelihood of outbursts. Parents also always indicated they needed to stay

alert and ready to intervene. Parents found it helpful to give their children cues to complete daily activities and to persist with routine demands. Distracting the child with activities was also found to divert them from problem behavior (O'Nions et al., 2017).

Chen et al. (2016) explored the social participation experiences of individuals with ASD. Existing literature cited in the study suggested that individuals with ASD spent little time in social interactions and more time in solitary or parallel activities. The study included individuals from Australia and Taiwan who were considered "high functioning" or had mild ASD.

In contrast with the previous findings, the study concluded that the participants did not report feeling lonely even when alone. Experiencing high social anxiety did not mean that the individuals from the study felt anxious all the time. The findings revealed the importance of "in-the-moment" experiences when seeking to understand the social views of individuals with ASD. The participants from the study reported having higher levels of enjoyment in social activities and solitary/parallel leisure than in other activities. The individuals from the study also experienced greater anxiety when engaged in social activities with little variation noted in loneliness across activities. Participants preferred interactions with casual friends compared to family members and preferred to be alone 75 percent of the time (Chen et al., 2016).

The study concluded that individuals with mild forms of ASD reported a low frequency for social participation. However, participants did not prefer to be alone when interacting with others, even when experiencing anxiety. The individuals in this study, in contrast to previous findings, did not report feeling lonely when alone. Additionally, the participants experienced anxiety but did not feel anxious all the time (Chen et al., 2016).

Dutka & Kalyn (2018) considered the outcomes of a study that implemented a daily activity routine to manage anxiety for high school students with ASD. The participants kept activity journals while paying attention to personal, physical, emotional, and cognitive responses. This study explored whether physical activity could increase self-control, cease unwelcome behaviors, and decrease anxiety.

The study included youth with ASD who participated in a routine physical fitness program. Previous findings concluded that several positive changes occurred when youth with ASD exercised regularly. Implementing at least 20 minutes of exercise was found to decrease anxiety, cause fewer behavioral challenges, increase socialization, and lead to more engagement with classroom work. The youth participated in an exercise program, based on previous research that produced positive changes in student behavior, improved concentration, and enhanced attitudes, to name a few. Exercise is known to increase levels of serotonin, norepinephrine, and dopamine and decrease other "noise" in the brain. It can be a distraction from anxiety by decreasing muscle tensions and building brain resources by teaching the brain a different outcome (Dutka & Kalyn 2018).

Dutka & Kalyn (2018) implemented a self-regulating routine to help students decrease anxiety through exercise. Since students with ASD are often in a state of anxiousness, the literature suggested that exercise has a positive impact on the well-being of students with ASD and assists with the negative effects of anxiety. Just 15 minutes of physical activity allows students to be more focused and ready to learn. Although some students experienced challenges with focusing, they were more willing to problem-solve and use communication strategies following their physical activity (Dutka & Kalyn 2018).

CHAPTER III: DISCUSSION AND SUMMARY

Summary of Literature

The literature review addressed the following topics and questions: What is Autism Spectrum Disorder (ASD)? What are the most common comorbid disorders? How prevalent are anxiety disorders for individuals with ASD? How can parents, caretakers, and especially educators, differentiate between ASD and anxiety? What tools and strategies are available for educators to implement in the classroom to help students with ASD who have various anxiety disorders?

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder categorized by deficits in social communication, social interaction, and restrictive, repetitive behaviors or interests across multiple settings (American Psychiatric Association, 2013). Individuals diagnosed with ASD can have many comorbid conditions that accompany the diagnosis. Some frequent comorbidities include mood disorders, anxiety disorders, obsessive-compulsive disorders (OCD), attention deficit hyperactivity disorder (ADHD), gastrointestinal symptoms (GI), Tourette's Syndrome, or sleep disorders. For this paper, I reviewed the comorbid condition of anxiety for individuals also diagnosed with ASD. ASD and anxiety have similar observable symptoms, making it difficult to differentiate.

The best way to differentiate whether symptoms are from an ASD or anxiety diagnosis is from a documented formal assessment completed by a healthcare professional with additional input from the individual's care team. Individuals with anxiety, specifically social anxiety, may have a severe fear about social situations or being judged by their peers. On the other hand, individuals diagnosed with ASD have trouble recognizing and reading social cues. ASD and

anxiety affect everyone differently. It is important to consider specific individual needs when planning intervention.

According to van Steensel, Bögels & Perrin (2011), specific phobia was the most common disorder followed by OCD, social anxiety disorder and agoraphobia, generalized anxiety disorder, separation anxiety disorder, and panic disorder. That same study found that children and adolescents with ASD were nearly twice as likely to have a type of anxiety disorder compared to typically developing children. The results from the Magiati et al. (2016) study concluded a positive relationship between anxiety and the severity of autism. It was found that 25 percent of the participants from the study presented clinically elevated anxiety symptoms. Settipani et al. (2012) concluded as many as 62 percent of children with mood or anxiety disorders show elevated ASD traits. The study concluded that no significant differences were found between youth with or without elevated ASD symptoms based on their age, sex, race, parental education, or socioeconomic status. However, children with elevated ASD symptoms had significantly more diagnoses than children without elevated ASD symptoms.

ASD does not have a one size fits all diagnosis or treatment plan. It is important to differentiate between the two conditions to determine appropriate treatment plans and targeted services for these individuals who struggle daily. In a 2014 study by Laugeson et al. (2014), researchers explored social skills training as a treatment for adolescents with ASD, specifically in the classroom. The study reviewed the implementation of a school-based, teacher-facilitated social skills intervention called the Program for the Education and Enrichment of Relational Skills (PEERS). PEERS is a social skills class led by teachers for individuals with ASD that focuses on making and keeping friends and dealing with rejection and conflict with peers. The

purpose of the study was to test the effectiveness of the school-based social skills intervention for individuals with ASD. According to Laugeson et al. (2014), utilizing teachers as social skills interventionists increased opportunities for social coaching and teachable moments in a setting that is natural for adolescents with ASD.

The use of Social Stories in the classroom can be an effective way to increase the understanding of social situations and expectations for individuals with ASD. Social Stories may not necessarily decrease anxiety. However, individuals with anxiety need to understand social expectations they have due to an extreme fear of being judged by others and therefore intentionally avoid social interactions.

An additional study concluded that participants who received Cognitive Behavioral Therapy (CBT) had significantly larger reductions in anxiety compared to the group of individuals on a waitlist to receive the therapy. McNally et al, (2012) provided evidence that the Coping Cat program effectively reduced anxiety in children with ASD. Based on the results from the study, over half (58%) of the participants in the CBT treatment group demonstrated remission of significant anxiety symptoms and no longer met diagnostic criteria for an anxiety disorder. According to the documentation, the CBT intervention results were comparable to the same anxiety remission for typically developing children who also completed the Coping Cat program.

Limitations of the Research

Anxiety and ASD have been diagnosed in the medical field for years with a plethora of research studies completed for each diagnosis. Research reviewing the combination of both ASD and anxiety is limited. ASD is characterized by varying degrees of communication impairment, social interaction deficits, and stereotyped interests and behaviors (van Steensel et al., 2011).

Anxiety is also viewed as being inherent to ASD. Research shows that children with ASD are at an increased risk of anxiety and anxiety disorders. Differentiating between specific ASD symptoms and anxiety is difficult due to their similarities. Wanting clarification helped guide my research. My goal was to determine which treatment plans and interventions could help autistic students with anxiety find success in the classroom.

Many of the studies that indicated the gender of the participants had significantly more male participants compared to females. Anxiety and ASD presented differently for participants based on gender. More research should be conducted to highlight gender differences when approaching treatment. ASD is a spectrum. There was not one study that considered how anxiety related to the subjects at different points on the spectrum and how that may have changed the intervention strategy outcomes. Only researching one end of the spectrum, such as high or low-functioning, presented a significant limitation to the results. Another limitation was the lack of diversity represented in the participants. Culture, race, ethnicity, and socioeconomic status certainly should be considered when determining how symptoms of these diagnoses present.

The Social Stories research was conducted in self-contained settings. Social Stories are a good fit for the general education environment due to the ease of implementation. The Kokina, A., & Kern, L. (2010) study on Social Stories was limited because the research was conducted only in a controlled self-contained classroom. Social Stories implemented in the general education settings should be considered.

Implications for Future Research

Anxiety in individuals with ASD is common but there is a lack of research about other comorbid disorders. Educators need to be aware of the difference between anxiety and ASD

along with strategies to implement interventions in the classroom. Additional evidence-based tools are needed for educators to have available in educational settings.

As determined by the van Steensel et al. (2011) study results, children and adolescents from specific ASD subtypes could be more likely to develop one specific type of anxiety disorder. The ASD subtypes are typically similar but the severity of communication, social interaction, and behaviors varies. However, studies suggested that the severity of each of these domains was rarely reported. Further research should focus on the severity of ASD symptom domains and whether the rates of particular anxiety disorders varied as a function of the severity.

Cognitive Behavioral Therapy (CBT) was shown as an effective treatment to help ease symptoms for individuals ASD and anxiety. However, implementing this treatment plan requires specialized training from professionals, such as social workers or school psychologists. CBT is not an intervention a classroom teacher could conduct independently to help ease anxiety symptoms during class time. However, the social worker or school psychologist could coach the classroom teacher about ways to implement tools to ease anxiety. Further research should be conducted regarding what specific CBT strategies are effective when used in the classroom setting by the teacher.

Professional Application

Upon reviewing the research about ASD and anxiety I found that there was not much information about tools and strategies educators can use to help students in a school environment who struggle with these diagnoses. There was a vast amount of research about individuals with anxiety and how to ease those symptoms as well as for individuals with ASD. When students display negative behaviors in the classroom, it is often attributed to their singular diagnosis of

ASD. This literature review illustrates there is more to consider. The research reviewed shows a need to train educators about ways to differentiate between anxiety and ASD symptoms. Schools should provide tools and intervention strategies for educators to implement in classrooms.

Conclusion

There is a common saying that if you have met one person with autism, you have met one person with autism. This speaks volumes about the difficulties professionals have if they are looking for a one size fits all approach to intervention because each student with ASD presents differently. There are significant differences from one ASD person to the next. However, it is important to note that research confirmed that having ASD makes children and adolescents prone to anxiety. To many people, the characteristics of ASD and anxiety appear to be similar. Having a better understanding of how to differentiate and treat ASD and anxiety can help improve the quality of life for ASD individuals and promote school success.

Although they can co-occur, ASD and anxiety are separate conditions. ASD is a neurodevelopmental disorder and anxiety is a mental health condition. There are several coping tools and resources that can help ease anxiety such as CBT, social skills training, and mindfulness strategies to name a few. I hope to educate people about published research and continue to study this topic because there is still so much to be revealed.

References

Adams, D., Young, K., & Keen, D. (2019). Anxiety in children with autism at school: A systematic review. *Review Journal of Autism and Developmental Disorders, 6*(3), 274-288. doi:10.1007/s40489-019-00172-z

"Anxiety Disorders." *Mayo Clinic*, 4 May 2018, www.mayoclinic.org/diseases-conditions/anxiety/symptoms-causes/syc-20350961.

"Autism." *World Health Organization*, 2023, www.who.int/news-room/fact-sheets/detail/autism-spectrum-disorders#:~:text=About%201%20in%20100%20children,and%20can%20evolve%20over%20time.

Ben-Itzchak, E., Koller, J., & Zachor, D. A. (2020). Characterization and prediction of anxiety in adolescents with autism spectrum disorder: A longitudinal study. *Journal of Abnormal Child Psychology, 48*(9), 1239-1249. doi:10.1007/s10802-020-00673-0

Carruthers, S., Kent, R., Hollocks, M. J., & Simonoff, E. (2018). Brief report: Testing the psychometric properties of the spence children's anxiety scale (SCAS) and the screen for child anxiety related emotional disorders (SCARED) in autism spectrum disorder. *Journal of Autism and Developmental Disorders; J Autism Dev Disord, 50*(7), 2625-2632. doi:10.1007/s10803-018-3774-8

Chen, Y., Bundy, A., Cordier, R., Chien, Y., & Einfeld, S. (2015). The experience of social participation in everyday contexts among individuals with autism spectrum disorders: An experience sampling study. *Journal of Autism and Developmental Disorders, 46*(4), 1403-1414. doi:10.1007/s10803-015-2682-4

Chang, Y., Quan, J., & Wood, J. (2012). Effects of anxiety disorder severity on social functioning in children with autism spectrum disorders. *Journal of Developmental and Physical Disabilities, 24*(3), 235-245. doi:10.1007/s10882-012-9268-2

Clarke, C., Hill, V., & Charman, T. (2016). School based cognitive behavioural therapy targeting anxiety in children with autistic spectrum disorder: A quasi-experimental randomised controlled trail incorporating a mixed methods approach. *Journal of Autism and Developmental Disorders; J Autism Dev Disord, 47*(12), 3883-3895. doi:10.1007/s10803-016-2801-x

"Data & Statistics on Autism Spectrum Disorder." *Centers for Disease Control and Prevention*, 4 Apr. 2023, www.cdc.gov/ncbddd/autism/data.html.

Diagnostic and statistical manual of mental disorders : DSM-5 (2013). (5th ed.). Arlington, VA: American Psychiatric Association.

Dutka, C, & Kalyn, B. (2018). Exploring strategies for anxiety management in autism spectrum disorder students through physical activity. *Journal of Higher Education Theory and Practice, 18*(1), 141-151. doi:10.33423/jhetp.vl8il.540

Ezell, J., Hogan, A., Fairchild, A., Hills, K., Klusek, J., Abbeduto, L., & Roberts, J. (2019). Prevalence and predictors of anxiety disorders in adolescent and adult males with autism spectrum disorder and fragile X syndrome. *Journal of Autism and Developmental Disorders; J Autism Dev Disord, 49*(3), 1131-1141. doi:10.1007/s10803-018-3804-6

Hallett, V., Lecavalier, L., Sukhodolsky, D. G., Cipriano, N., Aman, M. G., McCracken, J. T., . . . Scahill, L. (2013). Exploring the manifestations of anxiety in children with

autism spectrum disorders. *Journal of Autism and Developmental Disorders, 43*(10), 2341-2352. doi:10.1007/s10803-013-1775-1

"Home." *Psychiatry.Org - Home*, www.psychiatry.org/. Accessed 24 July 2023.

Howe, F. E. J., & Stagg, S. D. (2016). How sensory experiences affect adolescents with an autistic spectrum condition within the classroom. *Journal of Autism and Developmental Disorders, 46*(5), 1656-1668. doi:10.1007/s10803-015-2693-1

Kerns, C. M., Kendall, P. C., Berry, L., Souders, M. C., Franklin, M. E., Schultz, R. T., . . . Herrington, J. (2014). Traditional and atypical presentations of anxiety in youth with autism spectrum disorder. *Journal of Autism and Developmental Disorders; J Autism Dev Disord, 44*(11), 2851-2861. doi:10.1007/s10803-014-2141-7

Kokina, A., & Kern, L. (2010). Social story™ interventions for students with autism spectrum disorders: A meta-analysis. *Journal of Autism and Developmental Disorders; J Autism Dev Disord, 40*(7), 812-826. doi:10.1007/s10803-009-0931-0

Laugeson, E. A., Ellingsen, R., Sanderson, J., Tucci, L., & Bates, S. (2014). The ABC's of teaching social skills to adolescents with autism spectrum disorder in the classroom: The UCLA PEERS ® program. *Journal of Autism and Developmental Disorders; J Autism Dev Disord, 44*(9), 2244-2256. doi:10.1007/s10803-014-2108-8

Llanes, E., Blacher, J., Stavropoulos, K., & Eisenhower, A. (2018). Parent and teacher reports of comorbid anxiety and ADHD symptoms in children with ASD. *Journal of Autism and Developmental Disorders, 50*(5), 1520-1531. doi:10.1007/s10803-018-3701-z

Magiati, I., Ong, C., Lim, X. Y., Tan, J. W., Ong, A. Y. L., Patrycia, F., . . . Howlin, P. (2016). Anxiety symptoms in young people with autism spectrum disorder attending special schools: Associations with gender, adaptive functioning and autism symptomatology. *Autism : The International Journal of Research and Practice, 20*(3), 306-320. doi:10.1177/1362361315577519

Mayes, S. D., Calhoun, S. L., Aggarwal, R., Baker, C., Mathapati, S., Molitoris, S., & Mayes, R. D. (2013). Unusual fears in children with autism. *Research in Autism Spectrum Disorders, 7*(1), 151-158. doi:10.1016/j.rasd.2012.08.002

Mazzone, L., & Vitiello, B. (2016). *Psychiatric symptoms and comorbidities in autism spectrum disorder* (1st ed.). Cham: Springer International Publishing. doi:10.1007/978-3-319-29695-1

McNally, Keehn, R.,H., Lincoln, A. J., Brown, M. Z., & Chavira, D. A. (2012). The coping cat program for children with anxiety and autism spectrum disorder: A pilot randomized controlled trial. *Journal of Autism and Developmental Disorders; J Autism Dev Disord, 43*(1), 57-67. doi:10.1007/s10803-012-1541-9

Neil, L., Olsson, N., & Pellicano, E. (2016). The relationship between intolerance of uncertainty, sensory sensitivities, and anxiety in autistic and typically developing children. *Journal of Autism and Developmental Disorders, 46*(6), 1962-1973. doi:10.1007/s10803-016-2721-9

Nuske, H. J., McGhee Hassrick, E., Bronstein, B., Hauptman, L., Aponte, C., Levato, L., . . . Smith, T. (2019). Broken bridges—new school transitions for students with autism

spectrum disorder: A systematic review on difficulties and strategies for success. *Autism; Autism, 23*(2), 306-325. doi:10.1177/1362361318754529

O'Nions, E., Happe, F., Evers, K., Boonen, H., & Noens, I. (2018). How do parents manage irritability, challenging behaviour, non-compliance and anxiety in children with autism spectrum disorders? A meta-synthesis. *Journal of Autism and Developmental Disorders; J Autism Dev Disord, 48*(4), 1272-1286. doi: 10.1007/s 10803-017-3361-4

Rance, G., Chisari, D., Saunders, K., & Rault, J. (2017). Reducing listening-related stress in school-aged children with autism spectrum disorder. *Journal of Autism and Developmental Disorders; J Autism Dev Disord, 47*(7), 2010-2022. doi:10.1007/s10803-017-3114-4

Rodgers, J., Glod, M., Connolly, B., & McConachie, H. (2012). The relationship between anxiety and repetitive behaviours in autism spectrum disorder. Journal of Autism and Developmental Disorders, 42(11), 2404-2409. doi:10.1007/s10803-012-1531-y

Settipani, C. A., Puleo, C. M., Conner, B. T., & Kendall, P. C. (2012). Characteristics and anxiety symptom presentation associated with autism spectrum traits in youth with anxiety disorders. *Journal of Anxiety Disorders, 26*(3), 459-467. doi:10.1016/j.janxdis.2012.01.010

Spain, D., Sin, J., Linder, K. B., McMahon, J., & Happé, F. (2018). Social anxiety in autism spectrum disorder: A systematic review. *Research in Autism Spectrum Disorders, 52*, 51-68. doi:10.1016/j.rasd.2018.04.007

Syriopoulou-Delli, C., Syriopoulou-Delli, C., Polychronopoulou, S. A., Polychronopoulou, S. A., Kolaitis, G. A., Kolaitis, G. A., . . . Antoniou, A. G. (2019). Views of teachers on

anxiety symptoms in students with autism spectrum disorder. *Journal of Autism and Developmental Disorders; J Autism Dev Disord, 49*(2), 704-720. doi:10.1007/s10803-018-3752-1

van Steensel, F. J. A., Bögels, S. M., & Perrin, S. (2011). Anxiety disorders in children and adolescents with autistic spectrum disorders: A meta-analysis. *Clinical Child and Family Psychology Review, 14*(3), 302-317. doi:10.1007/s10567-011-0097-0

White, S. W., Lerner, M. D., McLeod, B. D., Wood, J. J., Ginsburg, G. S., Kerns, C., . . . Compton, S. (2014). Anxiety in youth with and without autism spectrum disorder: Examination of factorial equivalence. *Behavior Therapy; Behav Ther, 46*(1), 40-53. doi:10.1016/j.beth.2014.05.005

White, S. W., Ollendick, T., Albano, A. M., Oswald, D., Johnson, C., Southam-Gerow, M., . . . Scahill, L. (2012). Randomized controlled trial: Multimodal anxiety and social skill intervention for adolescents with autism spectrum disorder. *Journal of Autism and Developmental Disorders; J Autism Dev Disord, 43*(2), 382-394. doi:10.1007/s10803-012-1577-x

White, S. W., Lerner, M. D., McLeod, B. D., Wood, J. J., Ginsburg, G. S., Kerns, C., . . . Compton, S. (2015). Anxiety in youth with and without autism spectrum disorder: Examination of factorial equivalence. *Behavior Therapy, 46*(1), 40-53. doi:10.1016/j.beth.2014.05.005

White, S., White, S., Bray, B., Bray, B., Ollendick, T., & Ollendick, T. (2012). Examining shared and unique aspects of social anxiety disorder and autism spectrum disorder

using factor analysis. *Journal of Autism and Developmental Disorders, 42*(5), 874-884. doi:10.1007/s10803-011-1325-7