

## COGNITIVE BEHAVIOURAL THERAPY: HOW FAR IS IT EFFECTIVE FOR ASPERGER'S SYNDROME?

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### ABSTRACT

The general public has become more aware about Asperger's syndrome and it is no longer viewed as a disability but rather, a medical condition. Asperger's syndrome is not uncommon and being diagnosed does not mean that you are handicapped. People with Asperger's syndrome are equally capable of living a valuable life, as demonstrated by public figures bestselling British author Tom Cutler and Swedish environmental activist Greta Thunberg.

In this , Asperger's syndrome is introduced by its various diagnostic criteria and its unique characteristics followed by the discussion of the causes of this specific condition. It is very common for people with Asperger's syndrome to have other associated psychiatric comorbidities, for example, Cutler and Thunberg have also been diagnosed with depression and obsessive compulsion disorder respectively. The aspect of comorbidities of Asperger's syndrome will also be explored, and how cognitive behavioural therapy (CBT) is able to assist the management of symptoms of these comorbidities alongside the symptoms of Asperger's syndrome.

The efficacy of CBT for the condition was addressed by the evaluation of five studies of cognitive behavioural therapy for Asperger's syndrome or Autism Spectrum Disorders. That led to the conclusion that cognitive behavioural therapy may act as an effective method to address symptoms but is not a cure for the condition. A review of the limitations of the studies referenced is given and suggestions for possible parameters of future research to find the cause and a more efficient and directive treatment method for Asperger's syndrome.

### 1. INTRODUCTION

#### *Origin of Asperger's syndrome*

Asperger's syndrome (AS) was first described by a Viennese pediatrician, Hans Asperger (Asperger, 1944). 'Hans Asperger observed a group of boys and found them to show social isolation and lack of reciprocity in social interactions; normal or precocious language acquisition, with above-average linguistic skills but subtle abnormalities of verbal and non-verbal communication; a narrow focus of interests, often restricted to unpragmatic and highly original themes; overachievement in specific cognitive domains; and motor clumsiness.' (Barahona-Corrêa & Filipe, 2016). He emphasized that the syndrome that he was describing was different from infantile and juvenile schizophrenia. This could be justified by the absence of language delays and

average cognitive skills, which would contrast to the usual course of schizophrenia. His work remained virtually unknown until the release of *Asperger's syndrome: a clinical account* by Wing in 1981, which was followed by an exponential increase in publications about AS.

#### *Modern definition of Asperger's syndrome*

Since then, there has been an increasing amount of research conducted to investigate the causes of AS and how it could be effectively treated. Despite the expanding knowledge about AS, the rapid development has brought researchers and physicians back to the fundamental problem of, 'What is Asperger's syndrome?'. There has never been an agreed concept to the definition of AS or, more specifically, the diagnostic criteria of the disorder.

This has to be due to the nature of AS. AS is characterized by a pattern of symptoms, which each could vary in extent, giving an indistinct outline of the disorder and making it difficult to have a discrete description. This has led to the existence of different diagnostic criteria, namely, the Diagnostic and Statistical Manual of Mental Disorders (DSM) (American Psychiatric Association, 2013), the International Statistical Classification of Diseases and Related Health Problems (ICD) (World Health Organization, 1992), the Szatmari criteria (Szatmari, 2000), the Gillberg and Gillberg criteria (Gillberg, Gillberg & Råstam et al., 2001) and the Australian Scale for Asperger's syndrome (Garnett & Attwood, 1998).

In the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) AS was referred as a separate category from Autism disorder, with different described features (American Psychiatric Association, 1994). Now, AS is incorporated into the umbrella term of Autism Spectrum Disorder (ASD). AS is now referred as Autism Spectrum Disorder (ASD) Level 1 without accompanying intellectual or language impairment in the DSM-V (American Psychiatric Association, 2013). The rationale is that ASD can be conceptualized as a dimensional rather than categorical concept and that a single umbrella term of ASD, with specific information on the level of expression is more accurate and consistent with the research literature and clinical experience (National Autistic Society, n.d.).

In the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10), AS is classified under the category, Pervasive Developmental Disorders (PDD), alongside autism. It is described as being characterized by similar 'qualitative abnormalities of reciprocal social interaction that typify autism, together with a restricted, stereotyped, repetitive repertoire of interests and activities' (World Health Organization, 1992). AS could be distinguished from autism by the fact that there is generally no delay in language or cognitive development and clumsiness is often associated with the disorder.

The Szatmari criteria is published by Dr. Peter Szatmari, who is a Canadian researcher of autism and AS. His criteria covers five main areas: solitary, impaired social interaction, impaired nonverbal communication and odd

speech pattern (Szatmari P., Bryson S. & Boyle M., n.d.). He suggests that the validity of AS being a ‘true’ disorder is still unclear and promoted AS as a diagnosis to spark more research into the syndrome.

The Gillberg and Gillberg criteria are mainly targeted for teenagers and takes the form of an interview. The clinician is to interview both teenager and parent(s) separately and would score the interviewee based on set criteria on a questionnaire (Gillberg & Coleman, 1992). There are five main criteria that the Gillberg and Gillberg criteria focuses on: difficulty in mutual social interaction, narrow interests, speech and language problems, non-verbal communication problems and motor clumsiness (Leekam, Libby, Wing, et al., 2000). A diagnosis will then be made, based on the combined score of the questionnaires.

Similarly, the Australian Scale for Asperger’s syndrome is used as a screening tool to identify children who may have AS, who are then advised to receive a formal evaluation. It is to be completed by parents, teachers, or other professionals who know the child. The scale takes the form of a questionnaire and consists of 24 questions, divided into six sections. The questionnaire is answered according to a rating scale from 0 to 6, with 0 as the ordinary level expected of a child of that age. From this tool, those that are identified with the possibility of having AS should be referred for a more complete evaluation.

All criteria have been made from research and observations and are unquestionably valid. However, since the DSM-V is more well-known and established internationally, this review will mainly adhere to the description of AS in the DSM-V but will retain the name Asperger’s syndrome. Some of the studies referenced in this review are based on ASD and not specifically AS, so AS may sometimes be referred with the umbrella term ASD. AS is also referred as HFA in one of the studies cited, where HFA is a common, non-medical term used to describe the section of ASD without intellectual disabilities.

## **2. COMMON SYMPTOMS/CHARACTERISTICS**

Symptoms associated with AS may appear as early as the first year of life and more often affects males than females. Although included in the autism spectrum, Asperger’s syndrome could be distinguished from classic autism by its milder symptoms, the absence of language delays and average or above average IQ (Millcreek, n.d.). To an untrained observer, a child with Asperger’s syndrome may just seem like a neurotypical child (child without AS or ASD) behaving differently (National Autistic Society, n.d.).

The discussion of symptoms will be divided into 3 categories: Physiological, Psychological and Behavioral. Overlaps exist within the categories and one symptom is prevailed to lead to another, so the categories are only set up to present the symptoms in a logical manner.

### ***Physiological***

Children with Asperger’s syndrome tend to have heightened sensitivity towards overwhelming stimulations in

the five senses such as, loud noises, bright lights, unusual textures and strong tastes/smells (Brereton & Tonge, 2002). These distractions could lead to the individual being unable to notice social cues due to his/her attention being focused elsewhere. As stated by Bhandari (2018), while motor difficulties are not a specific criterion for AS, children with AS frequently have motor skill delays and may appear clumsy or awkward. This is may also be demonstrated as unusual gestures and body postures.

### ***Psychological***

Psychological symptoms include difficulties with changes or upsets in routine, difficulties picking up on the subtle changes in tone, pitch and voice that accompany a regular conversation, hence inability to understand sarcasm or jokes, as described in the article written by Tonge and Brereton (2011). People with AS may not understand conventional social rules and miss social cues, e.g. the use of hand gestures or change in tone when speaking. They usually want to fit in and interact with others but are puzzled in how to do so. They may be socially awkward, as a result of their cognitive dissonance. This brings about psychosocial symptoms, such as loneliness and social isolation, lowered self-esteem and even anxiety and depression (Holland, 2019).

### ***Behavioral***

Children with AS often like to collect categories of things, such as rocks or bottle caps. They may be proficient in knowledge categories of information, such as baseball statistics or Latin names of flowers (Bhandari, 2018). They may have good rote memory skills but struggle with abstract concepts. They frequently have good language skills but commonly show abnormalities in the subtle use and interpretation of language (Stöppler, 2019). Speech patterns may be unusual, flat or have a rhythmic nature, or may be formal, but too loud or high-pitched, leading to inappropriate social or emotional behavior (Brereton & Tonge, 2002). It is common for a child with AS to lack interpersonal relationship skills and have a one-sided conversation. Some may find it difficult to express their own feelings, while often verbalizing thoughts that most would keep private.

Generally speaking, these symptoms are all developmental and social related, which indicates that they are acquired and that there is a possibility to transform these symptoms into Characteristics that is less obstructive to daily life activities. Assistance through therapy, is preferred by most as it is non-invasive, cognitive behavioral therapy being the most common.

## **3. CAUSES AND RISK FACTORS**

There is no single evident cause for the development of AS. Considering the complexity of AS and the variation in symptom severity, there are several likely causes including environmental and genetic factors, that combine to give rise to its characteristics. As proposed by the U.S. National Library of Medicine (2020), common gene variations combined with environmental risk factors determine the risks of developing autism spectrum disorders, although not everyone with these gene variations are thought to be affected.

### **Environmental factors**

Researchers have been exploring the impact of environmental factors, such as viral infections, air pollutants, prenatal complications, e.g. in utero exposure to phthalates or pesticides and parental behavior. It is speculated that they may all play in the development of ASD. From the meta-analysis carried out by Modabbernia, Velthorst, & Reichenberg (2017), studies have shown that several environmental factors are unrelated to the risks of ASD, whilst others show associations with the risk of ASD to different extents. For instance, Rosen, Lee, Lee, Yang, & Burstyn (2015) found that maternal smoking has no links to the risk of ASD in the child, which the results were still consistent even after adjustment for socioeconomic status and parental psychiatric history.

### **Genetic factors**

Research has determined that several genes appear to be involved in AS. In some children, the presence of AS can be associated with genetic disorders, such as Rett syndrome or Fragile X syndrome (Marks, 2018). Another study, also described in Marks' (2018) work, on identical twins have also shown genetic correlations. It has shown that if one twin is diagnosed with an ASD, the other is likely to be affected to up to 95 per cent of the time.

On the other hand, it is thought that certain rare gene mutations are the cause of the development of ASD and/or AS. For example, rare mutations in the genes ARID1B, ASH1L and CHD2, are shown to be associated with ASD, as the mutations are likely to cause changes in gene expression and affect chromatin remodeling which would affect brain development (U.S. National Library of Medicine, 2020).

A *de novo* mutation in the Activity-dependent neuroprotective protein (ADNP) gene is also projected to be one of the most frequent single gene causes of autism (ADNP Kids Research, n.d.). When the mutation occurs, it causes a rare neurodevelopmental genetic disorder called ADNP syndrome, also known as Helsmoortel-VanDerAa syndrome where ASD occurs in a substantial proportion of cases (Sermone, 2017).

From the study by Gozes, Van Dijk, and Hacoen-Kleiman, et al. (2017), a biomarker has been identified for the ADNP syndrome. More than 80 per cent of infants with the syndrome developed early tooth eruption. This was the first of its kind, which could potentially identify children with a high risk of developing ASD and open up a lead for further research (NORD, 2019).

The evidence does show that there is a correlation between ADNP syndrome and ASD, however, no clear evidence shows a causative relationship. And even if it is proven that the two conditions are causal, the similarity in symptoms would cause significant difficulty in determining which condition the biomarker corresponds to and which is the driving cause and resulting complication. But nevertheless, these results are ground-breaking, and are signs of optimism for further research to uncover a biomarker and the underlying cause of ASD.

Genetical variation may also cause changes in brain development which will determine the severity of symptoms. Brain imaging studies have shown that there are structural and functional differences in specific areas of the brain of those who have AS versus those who do not. These differences may affect the way in which the brain is wired and further goes on to affect the neural circuits that control thought and behavior (Medlink, n.d.). This could serve as an explanation for the social awkwardness and lack of interpersonal relationship skills alongside average to above average IQ. It is just that people with AS perceive their surrounding environment in a different way to neurotypical people, and hence they react in a different way.

All these findings illustrate how there is evidence to support the environmental and the genetic side of the argument; therefore it is no longer an argument of which is the only cause, but rather, whether AS is affected by genetics or the environment to a greater extent. By finding the causes of AS, scientists and clinicians would hopefully be able to come up with a new treatment or modify therapies such as CBT for people with AS.

#### **4. ASSOCIATED CO-MORBID DISORDERS**

AS is not a stand-alone disorder, and often coexists with other psychiatric disorders. According to Shaker-Naeni, & Govender (2014), the ASD population has very high levels of co-morbid psychiatric difficulties with estimates ranging from 7-15 per cent, which anxiety related concerns amongst the most prevalent problems. CBT is commonly recommended for this population to address their psychiatric comorbidities such as anxiety, depression and bipolar disorders.

The frequent occurrence of anxiety in the AS population may be due to its fundamental characteristics. In the case of AS, their difficulties in coping with changes in routine, could lead to them feeling nervous and restless (Julson, 2018), and the abnormal persistence of these feelings could lead to anxiety. A review of 11 studies by White, Oswald, Ollendick & Scahill (2009) has reported comorbidity estimates for anxiety ranging from 11- 84 per cent. Despite the large range, this study still provides strong evidence that anxiety is a problem for a significant proportion of the ASD population.

Depression is also a common co-morbid psychiatric issue of AS. For individuals with AS, depression may be the result of being isolated and feeling pessimistic in social situations due to the lack of interpersonal relationship in people with AS. In the review by Magnuson and Constantino (2011), it is stated that many studies have reported increased risk of depression in children with ASD compared to neurotypical children and concluded that the prevalence rates of depression in children with ASD ranged from 1.4 – 38 per cent, showing a remarkable link between ASD and depression, analogous to that of anxiety.

Obsessive-compulsive disorder (OCD) may also be classified as a comorbidity of AS that is commonly treated by CBT, although clinicians may often find it difficult to differentiate between the characteristic repetitive

behaviour of AS and the compulsive behaviour due to obsession in OCD (Mazzone, Ruta & Reale, 2012).

## **5. COGNITIVE BEHAVIOURAL THERAPY FOR ASPERGER'S SYNDROME**

Although there isn't a curative treatment, there is a wide range of therapies available for people with AS. These therapies are mainly aimed to manage or relieve symptoms or comorbidities associated that are affecting the individual's daily activities or even, in severe cases, their quality of life. The following section will be dedicated to discussing the most common therapy for AS – cognitive behavioural therapy. The term 'client' will be used to refer to the individuals receiving therapy in the following sections.

### *What is Cognitive Behavioral Therapy?*

Cognitive behavioral therapy (CBT) is one of the most recognized 'talking therapy'. It is a psycho-social intervention that takes on a practical approach to problem solving, it aims to change the thinking or behavioral patterns that are behind the client's difficulties (Lambert, 2013). 'It is based on the theory that thoughts, feelings, what we do and how our body feels are all connected' (Beck & Beck, 2011).

CBT has the key characteristics of being collaborative, structured and active, time-limited and brief, empirical and problem-orientated. The therapist has knowledge about effective ways to solve problems, whilst the client has expertise in their own experiences where they are facing difficulties. Individual or group therapy sessions would usually be held once every week or every two weeks and approximately one hour long (British Association for Behavioral & Cognitive Psychotherapies, n.d.). The convention is to set an agenda for the therapy to be structured and problem-focused to ensure its efficacy in attaining its objectives. The therapist will actively engage with the client mainly in the form of asking questions which in the early phases may take up to 50 per cent of the time. This is to help the client break down the problem into components, such as thoughts, physical feelings and actions. The therapist will analyse these areas to work out if they are unrealistic and unhelpful and then determine the wider impact these components have on each other and consequently on the client. Then, a solution to change these unhelpful thoughts and behavior would be laid out as a goal to be achieved. (Attwood, 2006). As the therapy progresses, the client will gradually take up more responsibility, and to some extent become their own therapist. This enables the client to maintain self-care after completing all sessions with the therapist, which is the ultimate core objective of CBT.

## **6. STRENGTHS OF CBT**

Medications are an alternative to treating co-morbid mental disorders; however, CBT is the recommended intervention for coexisting problems by the National Institute for Health and Care Excellence (NICE, 2013). It is often favored over medication in concern of side effects of the drugs, such as nausea and insomnia. And evidence has proved CBT to be as effective or even more effective than anxiolytic and antidepressant drugs, as they only deal with anxiety or depression, whereas CBT can also tackle the unfavorable symptoms of AS.

CBT is also preferred because its treatment duration is shorter than that of taking medications. A CBT course is typically 16 sessions, which would take approximately 4-6 months, whereas an antidepressant course usually lasts for a minimum of 6 months before they could taper off the medication for someone who has had one episode (Conaway, 2010), and those with recurrent depression may be recommended to take antidepressants indefinitely (NHS, 2018).

CBT will help the client adapt to practical and helpful strategies in coping with stress and difficulties that are useful in daily life and can be continually used in the future, even after termination of the therapy. It focuses on the client's interpretation of an event, which is the origin of dysfunctional thoughts — inaccurate thoughts that reinforce negative emotions. Through CBT, the client will be able to review their interpretation and therefore change the way they think and feel, regardless of the event experienced, into a more positive and less distressful perception (Kennerley, Kirk & Westbrook, 2016). As one of the symptoms of AS is the inability in identifying social conventions, a solution would be for the client to understand and develop these skills through CBT. Therefore, when they encounter a social situation, they would be able to use these skills prevent or minimize miscommunication, and in turn, resolve the fundamental cause of the comorbidity of AS.

The study by Chalfant, Rapee and Carroll (2006), carried out a randomized controlled trial in evaluation of a 12-week group-delivered CBT treatment for 47 young people with anxiety and AS or high functioning autism (HFA). Prior treatment, over 74 per cent of the individuals of the sample met the criteria for more than one anxiety disorder. After twelve weeks, the children who received CBT showed a remarkable reduction in anxiety symptoms, 71.4 per cent of the treated group no longer met criteria for an anxiety disorder, compared to 0 per cent in the wait-list condition. It is noteworthy that the intervention was adopted for the treatment of children and adolescent with ASD and anxiety, which could have made a large contribution to the success in the CBT treatment.

Another study by Reaven and Hepburn (2003) measured the effects of a six-month CBT treatment for a seven-year-old girl with AS. Based on parent and child interview of symptoms, the girl's OCD symptoms decreased by 65 per cent post-treatment. Both studies support and present evidence of the efficacy of CBT in children and adolescents with AS.

### ***Weaknesses of CBT***

As proposed in the review by White et al. (2009), the 73 per cent gap for comorbidity estimates for anxiety could be accounted for by the difference in methods to measure anxiety, difference in definitions of diagnostic criteria and the degree of social impairment that is likely to have an influence on the individual's experience of anxiety. There is a possibility that the results are misinformation, and that AS and anxiety are not as strongly associated



as concluded in the study, directing the objective of the CBT away from the true issue.

As compared to taking medication to ease symptoms, CBT requires a lot more commitment. An essential factor to make the most out of CBT is engagement. The client may be assigned ‘homework’ to do outside sessions such as keeping a thought diary (White et al., 2009), which some people may find difficult and prefer to take medications.

CBT would also be unsuitable for people with more complex mental health comorbidities or learning disabilities. As explained by Shaker-Naeni & Govender (2014), ‘CBT relies on the individual’s ability to infer their own emotional states and thoughts in order to shift their cognitive style and in turn their anxious behaviour.’ Therefore, CBT may not be the ‘go-to’ treatment for everyone.

A problem with treating with CBT also occurs due to the difficulty in diagnosis. In conditions like AS and anxiety where symptoms and severity span a full spectrum, it is hard to distinguish whether the anxiousness experienced by the client is due to AS or an anxiety disorder, and as a result, severe anxiety disorders in ICD 10 have autism as an exclusion criterion. The different diagnosis is likely to result in different approaches, albeit presented with the same symptoms. With this confusion present, CBT may not be able to address the real problem and have no effect of the client, therefore it may not be the best treatment.

## **7. OTHER FACTORS**

Some might say that other factors contributed to the high success rate of CBT to a greater extent. For instance, modifications and parent involvement are two leading factors, that may not necessarily be a compulsory element of CBT but have a significant effect on the outcome on CBT.

In the study mentioned previously by Reaven and Hepburn (2003), the intervention was tailored for the girl’s OCD. They modified exposure and response prevention in the CBT, adapted to ‘unusual ideas and interests’ and emphasized the use of visual aids and parent involvement (White et al., 2009). The study concluded that the modifications were beneficial to the girl but was uncertain whether it will have the same effect on another child.

In the study by Chalfant, Rapee and Carroll (2006), the CBT treatment was adapted to a group-based program for treatment of childhood anxiety. The emphasis of generating the child’s own helpful and unhelpful thoughts were removed and turned towards simplified cognitive strategies, i.e. they pick their thoughts from a written list instead, and a greater focus was put on visual aids and exposure. This was to make up for their weak expressive communication skills and was concluded to have helped the children to complete the cognitive tasks. Both studies were ended with great success in reducing the problematic symptoms experienced by the clients, providing evidence that modifications in CBT can amplify the benefits experienced by the client.

A study by Sofronoff, Attwood and Hinton (2005), could be used to demonstrate the impact of parent involvement. It assessed the influence of a six-week CBT intervention for 71 school- aged children with AS. The children were randomly assigned to three groups: combined intervention (parent involvement in therapy), child-based intervention (no parent involvement) or wait-list. After the intervention was delivered, children who received either therapy were able to develop more coping strategies at endpoint compared to the children on the waitlist. Furthermore, children who received the combined intervention reported fewer symptoms of anxiety than those in the child-only intervention group. In short, it is evident from this study that parent involvement also fortified the benefits of CBT, however, a widespread conclusion would only be valid provided more research and studies have reached the same conclusion.

In addition, the impact of the common factors theory on the success rate of CBT is also noteworthy. The common factors theory suggests that different psychotherapies share similar therapeutic methods which more significantly accounts for its efficacy than its specific techniques. Likewise, suggested in Lambert and Ogles' (2004) review, cited by Brown (2015) that 'all therapies seem to be effective regardless of the specific techniques used'. One common factor of significance to this dissertation is the influence of the therapeutic alliance.

Therapeutic alliance requires a positive client-therapist relationship, to be able to unlock the client's own natural tendency toward growth and development. (Psychology, n.d.) Client motivation is an important factor that has a distinct impact upon therapy success as stated by Nelson (2015), citing Thomas' (2006) work. The characteristics of the therapist is also key to the success of CBT despite having standardized guidelines, as evidence has shown that on average, the therapist accounts for approximately 6-9 per cent of the variability in outcomes. (Psychology, n.d.)

Considering how heavily CBT depends on interpersonal communication, it is undeniable that both the personality of the client and therapist will have an influence on the efficacy. But more importantly, it is the compatibility of the client and therapist that could directly affect the outcome. However, interpersonal relationships are difficult to measure and define in discrete terms as they vary from person to person. Currently, there is no statistical evidence to show this causal correlation, even though therapeutic alliance is extensively acknowledged as an authentic common factor between psychotherapies.

## **8. EVALUATION**

The research in AS and in search for a cure or treatment has been faced with complications since the very beginning. The variability in its diagnostic criteria and aetiology is a major problem. Many researchers believe that there must be an underlying genetic cause for AS, and the environment is just a minor factor. Yet, the difference between AS and the neurotypical can be described as a behavioural phenotype. Phenotype, by definition, is the sum of an organism's observable characteristics that are influenced by its genotype and its

surrounding environment (Campbell, 2019), which means that the genotype and environment are equally important to the cause and continual effect of AS. This explains why modifications, parent involvement and therapeutic alliance have an effect in enhancing CBT benefits, as they can all be considered as environmental factors.

However, the modification that the studies made may or may not be legitimate alterations of CBT, they may just be adaptations that are still within the criteria of 'traditional' CBT. Since, a main principle of CBT is collaboration (Kennerley, Kirk and Westbrook, 2017), it could be acceptable to adapt to the preferences of the client as part of setting up the therapy as done in the case of the girl with OCD in the study of Reaven and Hepburn (2003). It would be more reasonable to classify modifications, as adjustments made that contradicts the therapy protocol but does not violate any of the core principles of the therapy. This would be a possible way to ensure that the modified CBT has sufficient difference for it to be compared with the traditional CBT.

Quality of life could be compromised as a result of having AS. They could experience isolation and communication difficulties in school and possibly in the future, at work. In the modern society, connections and networking is very important. Due to the weak communication skills of people with AS, this would be very hard to achieve and would therefore build on the feeling of isolation. The stress generated would become the driving cause for developing mental disorders, which would further negatively impact their quality of life, due to the inconvenience brought by their weak communication skills and obsessions, or the impact on mental health by the co-morbid psychiatric disorder.

## **9. CONCLUSION**

Asperger's syndrome falls within the category of Autism Spectrum Disorder. It is presented with typical autistic symptoms and behaviour, other than having average to above average IQ and no language delays. At present, there is no single treatment proven and well established for AS. Researchers have come across complexities in identifying a characterizing cause of AS and therefore has been unsuccessful in finding one single solution.

The spectrum of cognitive flexibility in AS to generate strategies against varying circumstances in different individuals is a major factor in the differentiation in developing different comorbidities. Having co-occurring comorbidities could further negatively influence the overall social impairment associated with AS, which could lead to misunderstanding in communication in a social setting. CBT is one of the most acknowledged methods to addressing these problems and has the capacity to adjust for different needs and complications by each individual. It has also been continuously recommended by NICE for many issues, demonstrating its appropriateness in managing the complexity in AS.

Overall, CBT is widely suitable and effective for the majority of clients, but different individuals will have

different needs, so it is more important for the individual to find a treatment and therapist that is suitable for them. The five studies reviewed have shown that CBT was effective in relieving symptoms of AS or an associated comorbidity.

#### **10. LIMITATIONS AND FUTURE RESEARCH**

All of the studies cited have a fairly small sample size and each have different variables evaluated, limiting the comparability of the results. Reliance of reports are also another limitation. Several studies have utilised therapist and parent report in addition to individual assessment. This may include biased due to being aware of the ongoing treatment. A more thorough evaluation of the therapy could be aided with the help of independent (blinded) ratings, including reports from school and/or workplace.

Other treatments methods such as medications, sensory integration therapy and speech language therapy have also been suggested for people with AS. It would be valuable for future research to conduct randomized controlled trials of these treatment methods, to further validate that CBT is the most suitable for AS, as current studies are only comparing CBT to a control (waitlist) group.

The severity of AS, cognitive ability, language ability, age, gender and associated comorbidity, if present, all play a role towards the individual's response to CBT. Perhaps future research would need to standardize these factors to fully study the influence of one, and also conduct a study to explore the epigenetics of AS, which optimistically would promote development of variations of CBT that targets the specific cause of AS.

Unquestionably, AS is an area that is understudied. CBT could be a very useful tool to help people with AS, but it requires a lot of communication to build an effective therapist-client relationship. This process may be time consuming, causing a delay in diagnosis and intervention which is unideal, and given the increasing number of children and adolescents diagnosed with AS, being able to refine the techniques of CBT for AS or developing a specific treatment method for AS would be optimal for the AS community.

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