Chapter-2 LITERARY RESEARCH FROM ANCIENT TEXT

2.0. Literary Research from Ancient Text

2.1. Introduction

Our ancient Indian civilization was practiced a different type of treatment method for the welfare of human beings. The great sages who lived for a long period by leading a healthy life introduced many systems like *Ayurveda*, Siddha, Unani and *Yoga* and preserved literature related to these systems for the welfare of the humans in the future. This information's quoted even in ancient scriptures like Vedas, Upanishad and Bhagavad Gita and much more. These scriptures were a treasure of knowledge and much has been destroyed by age and whatever remained was explored by few experts which are being practiced today. *Ayurveda, which* is prepared from plant extractions more widely used in rural India even today. Whereas *Yoga,* which is the way of life, gaining popularity all over the world nowadays due to its positive effect on different modern-day ailments. We searched ancient texts to extract any information about autism, but no precise information available. The information about symptoms similar to autism was found in different texts as explained below.

2.2 Reviews of Classical Texts

According to Indian Philosophy, *Ayurveda* has been a precise science practiced in ancient India since ages and continued practice even today. It was an essential part of the Indian system of

living and practiced as medical science by ancient rishis and seers. It was a part of the Vedas and *Charaka Samhita* described it as eternal (*Shashvata*). It was a very effective system of treatment of diseases. It has a long period of development in its various branches including surgery. It was very much advanced in ancient India.

2.3 Autism and *Ayurveda*

Though similar word for autism not found in *Ayurveda* but symptoms nearest to any terminology were found are somewhat similar. Any imbalance in the form of *bhramsa* of *thi, dhruti* or *Smriti*, whether collectively or singularly; if caused, an indulgence in unwholesome action, it is termed as *prajnaparadha*. Its direct consequence is *sarvadosa prakopa* and various types of derangements in *buddhi* as well as in physiological functioning and ultimately it becomes an important causative factor of the diseases. *Acarya Caraka* has enumerated the causative factors of all the diseases in a nutshell under the three heads viz. *asatmyendriyartha samYoga, prajnaparadha* and *parinama*. Out of these, highest significance has been attached to *prajnaparadha*.

The word *Unmada* (Psychosis), *Kaphja Unmada* refers to the disturbed mind mentioned in the *Charaka Samhita* and *Kashyapa Samhita*. All these problems can be grouped under the Psychosis disorders for the *Unmad*a of the ancient Ayurveda word. Person and especially children may be witnessed having a defect in the *buddhi* right from birth and generally, extend to the end of life in greater or lesser degree.

Various factors that may be responsible for *sthayi buddhi dushti* may be:

1. Complete *buddhi nasa* or *abuddha*.

2. *Buddhi.*

3. *Buddhi mandya.*

4. *Nirbuddhi.*

Out of these a complete *buddhinasa* or *abuddham* is the condition where the children are totally retarded and this condition is supposed to be incurable. *Jada* and *buddhi mandyas* are the conditions where the mental development is found to be impaired, children either understand little or understanding is delayed, or there is no sharpness in the intelligence. This condition, by appropriate treatment, may be corrected to some extent. Perhaps with this ideology, various *buddhi* sharpening recipes e.g. *Medhya Rasayana* etc. have been prescribed by the ancient Acharyas. *Nirbuddhi* is also a condition where is the absence of *dhi, dhriti and Smriti* is witnessed. However, such children recognize the pain and desire or satisfaction of natural urges. These persons may also be corrected by appropriate treatment to some extent, just to enable them partially adjusted in society.

उन्मादं पुनर्मनो बुद्धि संज्ञा ज्ञानस्मृति
भक्तिशील चेष्टाचार विभ्रमं विद्यात् ॥ (च. सं. नि. ७/५)

unmāda punarmano buddhi samjñā jñānasm ti
bhaktiśīla ce ācāra vibhrama vidyāt | (ca sa ni 7/5)

In *Charaka Samhita* about 600 BC, described mental ill health as resulting an imbalance among three kinds bodily fluids or forces (*doshas*). Different personality types were also mentioned. According to Acharya *Charaka Unmada* is unsettled conditions of *Manas* (mind), *Buddhi* (decision), *Smriti* (memory), *Sanjajananam* (orientation and responsiveness), *Smrithi* (memory) *Bhakti* (desire), *Sheel*a (habit), *Chesta* (activity), and *Achara* (conduct) (Dileep,

Sarvesh, & Narasimha, 2012).

Further, it can be defined according to excerpts from the *Charaka Samhita* that looks similar to present day Autistic Spectrum Syndrome (ASD) and in *Ayurveda* text mentioned as *Unmada.*

धीविभ्रमः सत्वं परिप्लवश्च
पर्याकुला दृष्टिरधीरता च ।
अबद्धवाक्त्वं हृदयं च शून्यं
सामान्यमुन्मादरादस्य लिङ्गम् ॥ (च. सं. चि. ९/६)

dhīvibhrama satva pariplavaśca
paryākula diradhīratā ca |
abadhavāktva hdaya ca śoonya
sāmānyamunmādarādasya ligam || (ca saṁ ci 9/ 6)

The three *Dosha*s or bodily humor of the body are *Vatha* (wind), *Pitta* (bile) and *Sleshma* or *Kapha* (phlegm). They exist in a definite proportion. If there is any variation in the proportion, health declines and even life is jeopardized. If the fixed proportion is maintained, they build up the different tissues of the body and tone the system. Though *Vatha, Pitta and Kapha* pervade throughout the body and are in a state of diffusion, yet there are special centers for them. According to *Ayurveda* qualities of mind depends on three *Gunas Sattwa, Rajas* and *Tamas. Rajas* and *tamas* are the *dosas* of *ma*nas which have relation with *tri dosas.* In *vata rajo guna* predominates; in *pitta satwa guna. Kapha tamo guna*. As per the *Charaka Samhita* two types of diseases affect any individual and they are *Sharirika* and *Manasika*.

The elements of *Ayurvedic* psychology are as follows

Mind (*Manas*), Intelligence (*Buddhi*), Memory (*Smriti*), Devotion (*Bhakti*), Conduct (*Achara*),

psychomotor activity, and Orientation and responsiveness (*Sajna Jnana*) *Unmada* is a common word for which represents modern time psychiatric or mental disorders. *Unmada* can be referred to the disturbed state of mind in which as an afflicted individual will not have regulated his/her actions and conducts according to set rules of the society in which he has to strive. In *Kaphaja Unmad*a person afflicted will have symptoms like fatigue (Sadhana), hypersomnia (*Svapnanityata*), staying in one place (*Sthanamekadeshe*), prefer to be solitude (*Rahaskmata*), less intellectual (*alpamati*), less appetite (*Alpabhug*) and edematous face (*Shvayathuranana*) (*Acharya Charaka*, 600 BC).

समुद्भ्रमं बुद्धिमनः स्मृतीनामुन्मादमागन्तुनिजोत्थमाहुः । (च. सं. चि. ९/८

samudbhrama buddhimana smtīnāmunmādamāgantunijotthamāhu | (ca saci 9 / 8)

Kaphaja Unmada afflicted individual show symptoms like loss of interest or pleasure associated with appetite disturbance, sleep disturbance, psychomotor agitation or retardation, decreased energy, difficulty in concentrating.

The Srimad Bhagavad Gita defines *Yoga* as *samatvam* meaning thereby a 'state of being' where equanimity manifests through physiological and biochemical homeostasis, psychological equanimity and intra-intra-trans-personal spiritual awareness, all integrated into a healthy and harmonious holistic balance. If we are to achieve this, it is imperative that we take into consideration the all-encompassing multi-dimensional aspects of *Yoga* that include a healthy life nourishing diet, a healthy and natural external –internal environment, a holistic lifestyle, adequate bodywork through *asana, mudra* and *Kriya*, invigorating breath work through the use of *Pranayama* and the cultivation of a healthy thought process through the higher practices of Jnana *Yoga* and Raja *Yoga*. *Yoga* is the ancient science of India, which

shows man not only how to claim his birthright of health and happiness, but also to obtain the goal of life – *Moksha*.

2.4 *Ayurveda* Treatment for Autism Spectrum Disorder

Ayurveda is an ancient science existing in India since time immemorial (more than 3000 years). The combination of two words *Ayur* (life) and *Veda* (science or knowledge) and *Ayurveda* medicines are prepared from plant or herbal extract, mineral, and metals. The present *Ayurveda* is the sources from mainly three *Sanskrit* texts namely *Caraka Samhita, Sushruta Samhita* and *Astanga Hridaya.*

2.4.1 "Autism ", in *Ayurveda* can be correlated to *Balagraha/Jada/Unmada*

Definition of Autism in *Ayurveda* can be- Any imbalance in the form of *bhramsa* of *dhi, dhrti* or *smrti*, whether collectively or singularly; if caused, an indulgence in unwholesome action, it is termed as *prajnaparadha*. Its direct consequence is *sarvadosa prakopa* and various types of derangements in *buddhi* as well as in physiological functioning and ultimately it becomes an important causative factor of the diseases. *Acarya Caraka* has enumerated the causative factors of all the diseases in a nutshell under the three heads viz. *asatmyendriyartha samYoga, prajnaparadha* and *parinama*. Out of these, highest significance has been attached to *prajnaparadha* (Radhakrishna, 2010).

The word *Unmada* (Psychosis), *Kaphja Unmada* refers to the disturbed mind mentioned in the *Charaka Samhita* and *Kashyapa Samhita*. All these problems can be grouped under the Psychosis disorders for the *Unmada* of the ancient Ayurveda word. Autism Spectrum Disorder considered as a brain disorder in modern medical science, it was mentioned in *Ayurveda* as *doshas* of life force. According to *Ayurveda*, Autism Spectrum Disorder symptoms mostly correlates with features of *Vatika* and *Unmada or Kaphaja Unmada (*Psychiatric disorders*).*

2.4.2 Treatment for Autism through *Ayurveda*

Ayurveda specifies to treat autism symptoms at different level like physical, mental and spiritual levels. According to classical *Ayurveda* treatment given to reduce *Unmada* which refers to Psychological disorders in modern medical science to normalize Autism Spectrum Disorder symptoms among affected children. Some of the treatment to managing *Unmada* among Autism children are *Deepana* and *Pachana* that enhances digesting ability, *Snehapana* that refers to use of medicated ghee, *Mridu shodhana* which refers to body purification by emesis or purgation, *Niruhabasti* and *Snehavasti* that refers to decoction enema and oil enema, *Sirovirechana* or *Nasya* which refers to medicated nasal drops and *Sanjnaprabodhana* which is used for stabilizing the mind.

Treatment for Autism symptoms from *Ayurveda* provided keeping in mind *Dosha* pacifying therapy (*Samsmana*), Bio cleansing therapy (*Samsodhana* or *Panchakarma*, Avoidance of causative factors (*Nidana Parivarjana*) and Favorable diet and regimens (*Pathya Ahara vihara*) (Gupta, Gupta, & Chavan, 2017). Certain herbal medication proved to have pharmacological and

clinical effect in treating ASD children. Some of the commonly used herbal medicines are Panax ginseng, Poria cocos, Acorus gramineous, Schisandra Chinensis and Glycyrrhiza uralensis to treat abnormal behavior, epilepsy, mental disease (Bang, Lee, Cho, & Yu, 2017).

According to Ayurveda Autism referred to as neuropsychiatric disorder under the category of the different type of psychotic disorders which refers to *Unmada* or *Kaphaja Undmada.* There are different ways mentioned in Ayurveda to manage these disorder such as *Daiva Vyapashraya Chikitsa* (Spiritual Therapy / Divine Therapy), *Sattvavajaya Chikitsa* (*Ayurvedic* Psychotherapy) and *Yukti Vyapashraya Chikitsa* (Rational use of drugs, diets, and activities). The treat these type of disorder there are different type of formulations use such as single drugs, *Churna* (powders), *Ashava / Arista* (fermented preparation), *Vati / Guggulu* preparations, *Ghrita* preparations, Oil preparations, *Bhasma / Rashausadhies*, *Avaleha*, *Arka* and *Nasya* (Nasal drops) (Dileep et al., 2012).

Chapter-3 REVIEW OF SCIENTIFIC LITERATURE

3.0. Survey of the Scientific Literature

3.1. Introduction

Survey of Scientific Literature was to find different types of interventions conducted to treat autism symptoms. Autism Spectrum Disorder (ASD) is a neurodevelopment disorder affecting a large number of children all over the world. Due to its complexity to establish precise etiology availability interventions also limited. The severity of the disorder varies from person to person which makes more complex in designing intervention suitable to the individual (Mcginn, 2002). Most of the interventions were kept in mind behavior problems of ASD children. Recent studies have shown ASD children suffer from both physiological and psychological conditions as explained below. All though several studies have done to investigate medical and neurological conditions in ASD children, relatively few reports have focused on the phenomenology and treatment of psychiatric disorder in this population. (Ghaziuddin, Mohammad, 2002). The causative factors are not known precisely for ASD symptoms and availability of pharmacological intervention also very little.

The purpose of the review is to find different types of an intervention, conducted previously, including *Yoga* for ASD children and its effectiveness. An extensive search was carried out by using different search engines on the internet like Google Search, PubMed, Shodhganga, Nature and Scientific review PsycINFO and The Web of Knowledge and so on. Even though thousands of articles have been searched in these websites, we found only a few were used for this study,

which includes Psychosocial Intervention and Applied Behavior Analysis (ABA) mostly used as behavior modification programs, Speech Pathology, dance, and music interventions, computer-based interventions, and interventions using alternative treatments like *Ayurveda*, mind-body medicine and *Yoga.*

3.1.1 Review Studies

A number of review studies have been done previously with relating to intervention for ASD children. Reviewers have searched and compiled previous studies in a different system of therapies and found some were useful for treating ASD children. Most of the treatment and therapies were for behavior modifications. These include allopathic system involving medicines, psychosocial intervention to modify maladaptive behavior problems and alternative therapies like mind-body medicine, physical exercises, *Ayurveda*, and *Yoga.* These review studies have been done after searching extensively on the internet and compiled information. A number of research papers have been published based on this information. These review papers recorded benefits of the different types of interventions to ASD children or an individual affected with autism spectrum disorder as shown in the tabulated form below.

3.1.2 Intervention Studies

Autistic children are known mainly for their social behavior problem with symptoms and behavior modification program was considered as a best-suited remedy in the most of the cases until recently. The Psychosocial Interventions are used as behavior modification program and being used even today which stands as the gold standard to train ASD children. Now there are other alternatives to commonly used which forms individual behavioral modification training.

Since the onset of autism among children can be diagnosed as early as between the age of 18 months to 30 months and if early intervention gave it is most useful. Apart from there is another type of interventions like alternative and non-pharmacological and medical treatment, alternative therapies like dance, music, exercise, *Ayurveda*, Homeopathy, *Yoga*, a certain type of physical exercise like Chinese mind-body exercises *Yoga*. Most of the interventions conducted in tertiary care centers, hospitals, special schools, and university research centers. Some of the interventions are shown in the table below.

3.2 Psychological and Physiological Problems of ASD Children

3.2.1. Sleep Problems

Sleep is one of the essential activities of human life broadly, saying required for all form life on earth. Food and sleep are the physiological needs human beings deprived of which manifest in the form of negativity. Recent studies on autistic children showing a different type of sleep disorders not having continuous sleep at a stretch, less sleep, wake up during sleep, snoring during sleep and breathing from the mouth during sleep (Klukowski, Wasilewska, & Lebensztejn, 2015). Lack of sleep leads to the negative cognitive effect of typically growing children and even adult population. Different therapies used to improve sleep problems of ASD children along with Applied Behavior Analysis treatment have a positive effect on ASD children (Paul Gringras, Dido, Green, Barry Wright, Carla Rush, 2014). With intensive treatment children can be placed academic classroom successfully. But deprived of sleep with an ASD child leads to a negative influence on their academic performance as well as daytime behavior. Lack of sleep leads to learning difficulties in any individual and same

happens with ASD children (Schreck, Mulick, & Smith, 2004). Even though few types of research have done involving ASD children of sleep problems and its negative effects on daytime behaviors but it proved that unstructured sleep problems lead to inappropriate behavior during the daytime, tendencies to sleep during daytime, learning difficulties, social behavior problems etc. Around 80% of ASD children suffer from sleep-related problems (Krakowiak, Goodlin-Jones, Hertz-Picciotto, Croen, & Hansen, 2008). Sleep-related problems lead to many problems like lack of attention and hyperactivity, communication and interaction deficiency, an epileptic seizure which is a common comorbid condition with ASD children which increases the severity of sleep-related problems. Children are prone to anxiety and depression, self-injurious behaviors, defiant behaviors and not able to imitate (Brown, Herrick, Luskin, & Cardwell, 2013; Ghaziuddin & Ghaziuddin, 2002). Sleep problems may lead to the intellectual disability of ASD children and parents have a concern about this. The majority of ASD children are having difficulty in initiating (going to bed) and maintaining the same for a long stretch. This sleep disturbance will manifest in daytime behavior problems according to latest researches. In one of the study, 63.7 % of children between age group five to sixteen years old have sleep problems as per parental report (Allik, Larsson, & Smedje, 2006). Unstructured sleep of ASD children disturbs entire family particularly immediate caretaker affected most due to deprival of sleep. There are some studies tried to analyze the sleep structure of ASD children in order to characterize better sleep pattern of ASD children using polysomnographic (Miano, Bruni, Elia, & Trovato, 2007).

Sleep problems are a common concern for individuals with Autism Spectrum Disorder (ASD). Although there is evidence that significant sleep problems are common in children with autism spectrum disorder (ASD) and that poor sleep exacerbates problematic daytime behavior, such

relationships have received very little attention in both research and clinical practice (Cohen, Conduit, Lockley, Rajaratnam, & Cornish, 2014). Disrupted sleep patterns and other difficulties pertaining to sleep often negatively affect academic, behavioral, physical, emotional, and social functioning. Hence, early detection of sleep problems in this population and the utilization of sleep-improvement intervention strategies by qualified professional may prove beneficial. Sleep problems are a common concern for individuals with Autism Spectrum Disorder (ASD). Disrupted sleep patterns and other difficulties pertaining to sleep often negatively affect academic, behavioral, physical, emotional, and social functioning. Many ASD-related sleep problems are not simply a result of environmental and behavioral issues. Some sleep-related issues may be reduced through the development of good sleep hygiene practices. Since a caregiver's ability to maintain a routine for a child can be significant in treating sleep problems. Since a caregiver's ability to maintain a routine for a child can be significant in treating sleep problems, an important component of improving childhood sleep problems involves parent education. For example, parents can exacerbate problematic sleep behavior by providing attention when the child has difficulty falling asleep or awakens during the night. Sleep problems among one or more family members can also significantly impact overall family functioning. This may further complicate other, secondary mental and medical health conditions. Parents of children with ASD are just as likely to report this. This can negatively contribute to family malfunction. Since chronic sleep difficulties are linked to an increase in anger and stress in adults this leads to trouble sleeping. This can become a cyclic pattern because family problems can negatively impact a child's quality of sleep. Finally, the treatment of sleep-related difficulties in children with ASD may benefit overall family functioning and well-being.

3.2.2. Gastrointestinal Problems

GI disorder is common among persons with autism and affects up to 85% of children with ASD. These conditions range in severity from a tendency for chronic constipation or diarrhea to inflammatory bowel disease. Pain caused by GI issues can prompt behavioral changes such as increased self-soothing (rocking, head banging, etc.) or outbursts of aggression or self-injury. Conversely, appropriate treatment can improve behavior and quality of life.

Some children with autism spectrum disorders (ASD) are characterized by fluctuating behavioral symptoms following immune insults, persistent gastrointestinal (GI) symptoms, and a lack of response to the first-line intervention measures (Gorrindo et al., 2012). These children have been categorized as the ASD-inflammatory subtype (ASD-IS). Gastrointestinal disorders and associated symptoms are commonly reported in individuals with ASD but key issues such as the prevalence and best treatment of these conditions are incompletely understood. A central difficulty in recognizing and characterizing gastrointestinal dysfunction with ASDs is the communication difficulties experienced by many affected individuals (Odom, Boyd, Hall, & Hume, 2010). The gastrointestinal disorder is another medical comorbidity associated with ASD children. Way back in 1944 observation of 11 children 7 were had eating or dietary problems. Symptoms associated with gastrointestinal are chronic constipation, vomiting, gaseousness, bloody stools, diarrhea, and inflammation such as lymphoid nodular hyperplasia, complement activation and elevated pro-inflammatory cytokines and also intestinal pathologies such as enterocolitis, gastritis, and esophagitis (Hsiao, 2014). About 23 to 79% of ASD children suffer from gastrointestinal disturbance (Chaidez, Hansen, & Hertz-Picciotto, 2014). ASD children have a high risk of feeding problems narrowing down to the selectivity of foods not

eating nutritional foods like fruits, vegetables, and nuts (Buie, Campbell, Hyman, & Jirapinyo, 2010; McElhanon, McCracken, Karpen, & Sharp, 2014).

3.2.3. Behavior Problems

Many persons with autism have unusual responses to sensory input. They have difficulty processing and integrating sensory information or stimuli such as sight, sounds, smells tastes and/or movement. They may experience seemingly ordinary stimuli as painful, unpleasant or confusing. Some of those with autism are hypersensitive to sounds or touch, a condition also known as sensory defensiveness. Others are under-responsive, or hypersensitive. An example of hypersensitivity would be the inability to tolerate wearing clothing, being touched or being in a room with normal lighting. Hypersensitivity can include failure to respond when one's name is called. Seizure disorders, including epilepsy, occur in as many as 39 percents of those with autism. It is more common in people with autism who also have an intellectual disability than those without. Someone with autism may experience more than one type of seizure. The easiest to recognize is the grand mal, or tonic-clonic, seizure. Others include "petit mal" seizures (when a person temporarily appears "absent") and subclinical seizures, which may be apparent only with electroencephalogram (EEG) testing. Seizures associated with autism tend to start in either early childhood or adolescence. But they may occur at any time. If you are concerned that you or your child may be having seizures, it is important to raise the issue with your doctor for a possible referral to a neurologist for further evolution. The process of setting goals, developing action plans to achieve those goals, implementing and following the action plans, evaluating the outcomes of the action plan, and changing action plans if the goal

is not achieved (Wehmeyer, Shogren, Smith, Zager, & Simpson, 2010). Self-Stimulatory Behaviors are behaviors that can interfere with positive social behavior or learning and integration into community settings. This can include body rocking, spinning, hand flapping, object tapping gazing at the lights and mouthing (Rosenthal-Malek & Mitchell, 1997). A sensory processing difficulty impairs responses to, processing of, and/or organization of information that affects participation in functional daily life routines and activities (Miller, Nielsen, Schoen, & Brett-Green, 2009). Difficulties processing sensory stimuli may be not responding to the environment, over sensitivity to the environment, or seeking out more sensory input (Simpson et al., 2004). As early as infancy, a baby with ASD may be unresponsive to people or focus intently on one item to the exclusion of others for long periods of time. A child with ASD may appear to develop normally and then withdraw and become indifferent to social engagement. Children with an ASD may fail to respond to their names and often avoid eye contact with other people. They have difficulty interpreting what others are thinking or feeling because they can't understand social cues, such as tone of voice or facial expressions, and don't watch other people's faces for clues about appropriate behavior. They may lack empathy.

3.3 Treatment for Autism Spectrum Disorder

3.3.1 Conventional Treatment (Medication)

The exact cause of the autism disorder not able to identify till now, the availability of conventional treatment also limited. Since autism is due to neurological related problems

medication is not very effective or advisable for long duration treatment due to side effects. But some drugs and medications are being used to treat some of the manifested behavioral problems of autism like attention deficit, hyper activeness, impulsivity, withdrawal symptoms, anxiety and aggressive behaviors. Most commonly used drugs for treating some of the autism behavior are antipsychotic drugs, antidepressants, stimulants and other drugs like anticonvulsants.

Antipsychotic drugs are widely used drugs which include risperidone (Risperdal), olanzapine (Zyprexa) and quetiapine (Seroquel) to control or to reduce the hyperactive behavior, repetitive behaviors, aggressive and self-injurious behaviors and withdrawal symptoms. These are a new group of drugs which have lesser side effects compared to earlier ones.

Stimulants group of drugs includes amphetamines (Adderall and Dexedrine) and methylphenidate (Ritalin) which helps in treating attention deficit and hyperactive disorder and concentration ability of autistic children.

Antidepressants mainly include serotonin reuptake inhibitors (SSRLs) and are commonly used a class of medicines for anxiety, depression and obsessive-compulsive disorder behavior of autistic children. Some of the antidepressant drugs are fluvoxamine (Luvox), fluoxetine (Prozac), sertraline (Zoloft), and paroxetine (Paxil). Some of these drugs are used to treat irritability, repetitive behaviors, aggressive and self-injurious behaviors, tantrums etc. related to autistic children. Some other antidepressant drugs less frequently used are Mirtazapine (Remeron),

Clomipramine (Anafranil), Amitriptyline (Elavil) and Bupropion (Wellbutrin) (Akanksha, Sahil, Premjeet, & Bhawna, 2011).

Some autistic children suffer from convulsions and some of the drugs used as anticonvulsants to manage seizures are Alpha-2 adrenergic agonists (Clonidine) which sometimes used to treat behavior and hyperactive problems.

Though some of the above medicines are effective to some extent these cannot be used for a longer period due to many side effects which can short time or long time side effects. Most of the children develop resistant to drugs hence long term usage of drugs are avoided.

Most of the parents fear side effects of these drugs and opt for alternative or non-pharmacological medicines or therapies.

3.3.2 Behavior Interventions

Aberrant Behavior Analysis is the most commonly used type of intervention for ASD children. Most of the interventions being used for ASD children are behavior modification programs and it is gold standard since children are more identified with maladaptive behaviors (Memari, Panahi, Ranjbar, & Moshayedi, 2015). The deficit in social communication and lack of social behavior of ASD children plays havoc on them. ASD children frustrated at certain situation due to their inability to express themselves which leads them to behavior problems. ASD children are prone to anxiety and depression due to their helplessness situation. Children totally

depend on their caretakers unless proper intervention methods adopted at an early age. Autism Spectrum Disorder is a heterogeneous in nature and needs of each of them required to be analyzed and shout

3.3.3. Psychosocial Interventions

ASD children are a deficit in social communication and social behaviors which incapacitate them under the situations around them and act accordingly. It is a complicated and diverse case of developmental disorder. In the majority of cases, behavior therapy is being used predominantly to modify social behavior with reward scheme (Anne & Roberts, 2007). The biological process in and the individual may result in aggressive behaviors of ASD children, which not in the control of the individual. ASD children's outbursts happen without their level of understanding and often confuse them in a situation. Due to this children become seek immediate attention of caregivers and failure of which makes them more and more aggressive and turn self-injurious behavior or injuring others. This requires urgent intervention at an appropriate age. Psychosocial intervention is the primary requirement for ASD children to develop minimum communication skills and social behaviors. It also helps in mutual sharing, active participation and to be attentive towards their surroundings.

3.3.4. Alternative Therapies

Alternative therapies are widely used for ASD children by their parents. Parents search for complementary and alternative therapies which are sustainable and cost-effective either due to its effectiveness or for a lesser cost. These complementary and alternative therapies are either based on ancient treatments or locally available remedies largely believed that they are without

any side effects. Hundreds of therapies appear when searched the web but parents goes for evidence-based therapies. Complementary or alternative therapies like *Ayurveda*, homeopathy, mind-body medicine, energy medicines, biological- based medicine, dance, music, and *Yoga*. About 50 to 75% of ASD children treated with complementary medicine or therapies of that 50% goes for biological based medicine and rest go for other therapies like mind-body medicine and manipulative medicines (Levy & Hyman, 2008).

Limited application and high-cost parents of ASD children often go for alternative and complementary medicine of therapies. The fear side effects of using conventional medication for a longer time also one of the reasons for parents going in search of alternative medicine apart from the belief that alternative medicine if not effective there won't be any side effect of it. Parents also search for evidence-based alternative therapies, *Yoga*, and mind-body exercises. Failure to diagnose disorder at the appropriate age aggravates the severity of ASD children and not finding immediate relief parents opt for alternative therapies. Around some of the alternative therapies being used around 31.7% to 74% of the ASD population adopt one or other alternative therapies (Hall & Riccio, 2012). Complementary and alternative are different categories which include biologically related practices, mind-body medicine, energy medicine and manipulative and body-based practices, a supplement of vitamins, specific or modified food diets, and ancient medical systems like *Ayurveda*, Homeopathy, mind-body exercises and *Yoga* (Levy & Hyman, 2008). Some of the alternative therapies being used may not have any evidence of its effectiveness, whereas *Ayurveda* and *Yoga* have proved to be effective.

3.4 *Yoga* as an Alternative Therapy

As we know the *Yoga* effects at different levels in the human body as *Punca Kosas* like *Annamaya Kosa, Pranamaya Kosa, Manomaya Kosa, Vijnanamaya Kosa and Anandamaya Kosa* and brings positive changes both mentally and physically (Zuchnik, 2011). *Yoga* is used as therapy to treat and control the different ailments around the world and it is found to be successful (Behar, 2006). Research has found *Yoga* to be used for mental health also (Satishchandra, 2015). *Yoga* modules have been developed to treat different ailments in S-VYASA and thousands of people getting the benefit of it. Ailments like diabetes, hypertension, which are lifestyle disorders can be controlled and use of pharmacological medicines can be minimized. Since autism spectrum disorder will affect both physical and psychological levels through the specific *Yoga* program severity of autistic symptoms can be minimized and with a longer period of intervention, positive changes can be observed (Keshavan, M S, 2015). Since *Yoga* strengthens both physically and mentally this can be used to bring changes in the autistic children also (Porter, 2013). There is no specific module for children affected with ASD as such, but there are *Yoga* modules. Due to lack of communication where ASD children are unable to express themselves gastrointestinal problems causing many problems to the children. Children suffer from urine and fecal incontinence, bed wetting, irritable bowel syndrome, etc., but due to lack of communication ability, they are subjected to high level of anxiety. Parents' stress level, the particularly mother is very high due to all these problems. There will be a huge financial burden also for families of ASD children. Till now more attention was given to improve behavior problems of ASD children with *Yoga* modules (Radhakrishna, 2010b). In this study, three areas of problems were considered covering both

physiological and psychological aspects of ASD children. The three domains considered here are a sleep disorder, digestion related problems and food habits and subsequent daytime behavior problems (Studnitzer, Allen, 2014).

3.5 Brief explanation of the some of the interventions shown in the table below

As shown in the table below is different types of intervention studies done and its effect. A *Yoga* intervention for ASD children has shown positive results. Most of the interventions done in foreign countries and few were in India. The majority of the studies has been done in America, UK, and China. Although these intervention studies have found to be effective and this disorder affecting the more and more children by passing of years simultaneously more *Yoga* intervention studies required. Some of the interventions were done in special school meant for autistic children as well as tertiary care centers or University research centers. The majority of the ASD children are affected by a sleep disorder, GI problems (food habits and digestion problems) and other behavior related problem. Most of the previous interventions have done to improve the behavior problems of ASD children. Attention was not given to improve physiological problems like digestion problems and sleep disturbance and food habits subsequently which leads to daytime behavior problems.

3.5.1 A study by Shantha Radhakrishna, Raghuram Nagarathna, 2010

A specially formulated Integrated approach to *Yoga* therapy and autism spectrum disorder was conducted previously which was a control group design with 6 children each (n=6). It was

conducted to test the efficacy of *Yoga* for seven variables of ASD children and data collected pre, mid and post-therapy. *Yoga* intervention was conducted for the 10-month session of two academic years with two months summer holiday. Variable tested here are Eye to eye gaze (EEG), Sitting tolerance(ST), Body Awareness(BA), Body posture (BP), Depth perception and balance (DPPB), Self-stimulatory behavior (SSB), Receptive skills related to spatial relationships (RSRSR) and Self-injurious behavior (SI). The intervention group was given every one-hour *Yoga* intervention apart from 15 hours applied behavior analysis (ABA). Control group given only 15 hours applied behavior analysis (ABA) per week. Changes in communication, social, cognitive and adaptive skills were compared to six matched control groups. A total of forty-two established ASD children were profiled and six were selected. All the children were attending regular sessions for the applied behavior analysis session. Special educators and parents helped to collect data through an item

An assessment was conducted pre-(session 1-12), mid-(session 200-202), and post- (session 389-391) the intervention. 1 hour per day and five days a week *Yoga* intervention was given to *Yoga* group and one of the parents helped children during the session. *Yoga* session included warm-up, strengthening, the release of tension and calming exercises. The result was presented in three parts as first baseline characteristic, the second impact on ASD symptoms and perceived child outcomes and third effects on behavior, nonverbal skills, social interaction, imitation and repetitive stereotyped behaviors (RSB). Even with small sample size, significant results have been found. After the first 12 sessions not much changes observed but in mid-session observation some changes seen in eye-to-eye gaze (by focusing on the lighted candle, focus circle, color mat), sitting tolerance and body posture apart. Other improvements seen were

in receptive skills to verbal command concerning the spatial relationship during some asanas, imitation skills, self-stimulatory activity and self-injurious behaviors. Teachers were reported about increased alertness among children.

3.5.2 A study by Sharma & Sharma, 2016

In this intervention marked changes seen in the behavior of ASD children, increased sitting tolerance and adult proximity and subsequent socialization. Slow mantra chanting increased oral-facial movement imitation skills. Significant changes happened in communication skills, language, play and attention span. Eye contact steadily improved children started looking at therapist to share, reciprocate and initiate. An intervention is done where both yogic and recreational activities were used to check improvement in the self-injurious and aggressive behavior of 20 autistic children between age group 8 to 14 years from mentally challenged children. This intervention included both parents and teachers and self-made scale by investigators in the form of the item was used to collect the data pre and post-intervention which was held for 90 weeks and six days per week. The scale was constructed and standardized in consultation with a national and international psychiatrist.

The session was held at morning 7 to 9 am and evening 5:30 to 7:30 pm. In the morning session, the yogic session was conducted which included *Haläsana, Trikonäsana, Padmäsana, Naukaäsana, Vajräsana, Shaväsana, Pachimottanäsana, Vrikshäsana, Titliäsana, Sarvangäsana, Tadäsana, Dhanuräsana, Bujangäsana, Suryanamaskara, Bhramari Pranayama, Kala Hati, Ujjayi Pranayama, Aluloma-Viloma Pranayama, Virabhadräsana,* and

Meditation. In recreational activities, it included stand up and sit down, baby walk, on the spot jump, matching the colors of balloons, nail paint, crazy cards, matching flowers, matching pet toys, vegetables, and fruits, softball throw, bowling arrange the circle rapid fire and some other physical activities. In the result mean and standard deviation of the pre-test of the *Yoga* group in relation to the self-injurious behavior of autistic children by mother, father and teacher were 53.60 and 0.54, 53.6 and .054, 53.86 and .049 where the mean and standard deviation of post-test of the *Yoga* group in relation to self-injurious behaviors of autistic children by mother, father, and teacher were 32.40 and.89, 31.20 and 0.44, 31.89 and 1.34. Mean and standard deviation of the pre-test of the logic recreational group in relation to self-injurious Behavior autistic children by mother, father and teacher were 53.60 and .054, 53.60 and 0.54, 53.86 and 0.66 whereas mean and standard deviation post-test of recreation group in relation to self-injurious Behavior of autistic children by mother, father and teacher were 35.20 and 1.30, 34.60 and 1.51,35.50 and 1.34. The result shows confirmed that yogic activities have a significant effect on the self-injurious behavior of autistic children. This significant was found in the aggressive behavior of autistic children post yogic intervention. Similarly, recreational activities also have shown a significant effect on self-injury as well as the aggressive behavior of autistic children. So it was concluded that both yogic and recreational activities should be part of an intervention strategy for autistic children of the self-injurious and aggressive behavior of autistic children.

3.5.3 A study by Koenig, Buckley-Reen, & Garg, 2012

Get Ready to Learn (GRTL) *Yoga* was conducted by Kristie Pattern Koenig and others which were pre-test-Post-test control group design and convenience sample from one of the

largest urban public schools in New York, America involving 48 autistic children. *Yoga* group had 24 children and control group left with 22 children at the end. Intervention group manualized *Yoga* intervention for 6 weeks on a daily basis. It was conducted to measure the effectiveness of manualized occupational therapy challenging behaviors of ASD children in a classroom environment. It was included *Yoga* posture, chanting and breathing and relaxation exercised for elementary school students with ASD having challenging maladaptive behavior. It was a daily classroom-based preparatory *Yoga* program developed by Anne Buckley-Reen to enhance the functional and academic performance of the students with a variety of disabilities. *Yoga* is increasingly being used across the United States as a way to have an impact on and enhance students' behavioral and academic functioning such as their attention, concentration or focusing ability, impulse control, strength, motor coordination and social skills etc.

Participants from eight classrooms from large urban school which serves 700 students with autism with diverse minority student population and 64% of them classified as an economically disadvantaged group. Inclusion criteria were 1.diagnosed as an ASD, 2.elementary school age and 3.no known the medical condition that prevents participation in the GRTL program. Participants received 2.5 hours in-service training by a trainer who developed the program, received GRTL program DVD to practice, instructional material and *Yoga* mat necessary or practice and teachers were asked to complete ABC community for their students on their own. Teachers were also provided with video cameras to video graph the activities. GRTL program was conducted every day for 16 weeks. Data were collected through video recorder. Data were analyzed with SPSS Version 18.

They have recruited 6 children each of eight classes, a total of 48 children. Both the group

having had 24 children each but for control group parents of two children changed school, hence control group left with 22 children at the end. There was no much difference in age, sex, ethnicity, and VABS- II scores among two groups. Posted 16 weeks manualized *Yoga* intervention program, students who engaged in standard morning routine showed a reduction in behavior maladaptive identified by teachers which included irritability, lethargy, social with a drawl, hyperactivity, and noncompliance. This intervention shows that through *Yoga* intervention occupational therapist can bring changes in behavior problems in ASD children.

3.5.4 A study by Shantha Radhakrishna

An intervention using the application of integrated therapy to increase imitation skill among ASD children, which conducted for 10 months involving six children from the SGS Vagdevi Integrated School who were matched for age sex, IQ and Socioeconomic background of parents. Children were diagnosed as ASD using DSM-IV-TR. Weekly five days of a *Yoga* intervention for 45 minutes for 10 months period was given. *Yoga* asanas (postures), and *Pranayama* (breathing practices) were specially selected to address issues related to imitation difficulties with ASD children. Outcomes are measured at mid and end points of the program through the parents' interview schedule to see changes on target five areas of behavior. Imitation test battery based on the task developed by previous pilot study experience by a researcher who is a speech/language /*Yoga* therapist by profession was used for assessment. A simple 3 point scale was used based on the previous study to obtain information on the level of benefit (0 = rarely imitates, 1= occasionally and 2 = consistently imitates). Trained professionals were used to observe and record readings. *Yoga* intervention consisted of

warm-up asana, strengthening *äsana*, releasing of tension *Äsana* - calming *äsana* and breathing *äsana* and most of these *äsana* were simple physical stretching *äsana*. In the case of a child not imitating therapist parents present helped and most of the children gradually learned to imitate actions. At the start of the intervention, all the six children were very poor in breathing exercises as most of them lacking imitating skills. During mid-session, there was a significant change in imitating gross motor actions, oral facial movements and perform breathing exercises but lacking in complex imitating and vocalization. Only in the last sessions, significant changes seen in imitation related to all the five parameters and changes in communication, functional object use and play and joint at were seen. With the progress of therapy increase in imitation skill noticed further. Children started enjoying therapy with attentive towards the therapist and following instructions. At the end of the therapy period children engaged in 30 to 45-minute *Yoga* without break and built rapport with a therapist. All the six children showed an increase in vocal imitation skill by imitating “a, e, i, o, u” the vowels and OM are chanting which shows increased vocal imitate skills. It was a first scientific study involving ASD children in India to find the effect of imitation skills through *Yoga* intervention. It also can be an effective management to in treating ASD children involving families and also for teachers in the schools.

TABLE 3.1: REVIEW OF INTERVENTION STUDIES

Author and year of publication	Sample size (n)	Design	Intervention	Variables studied	Findings
(Shantha Radhakrishna, Raghuram Nagarathna, 2010)	*Yoga* n=6 Control n=6	Age-matched control group design	*Yoga* Intervention	Eye to eye gaze(EEG), Sitting tolerance (ST), Body Awareness(BA), Body posture (BP), Depth perception and balance (DPPB), Self-stimulatory behavior(SSB),	Marked changes observed by mid-session assessment eye-to-eye gaze, sitting tolerance, body posture. Improvements were observed in receptive skill to verbal commands concerning spatial relationship imitation skills, self-stimulatory activity, and self-injurious behaviors.

(Sharma & Sharma, 2016)	N=20	Single group design	*Yoga* Intervention	Self-injurious behaviors, aggressive behaviors	The result shows confirmed that yogic activities have a significant effect on the self-injurious behavior of autistic children. This significant was found in the aggressive behavior of autistic children post yogic intervention. Similarly, recreational activities also have shown a significant effect on self-injury as well as the aggressive behavior of autistic children. So it was concluded that both yogic and recreational activities should be part of an intervention strategy for autistic children of the self-injurious and aggressive behavior of autistic children.

(Koenig, Buckley-reen, & Garg, 2012)	Intervention n=24, control n =22	Pre-test, post-test control group design	*Yoga* Intervention	Irritability, lethargy, social withdrawal, hyperactivity, and noncompliance.	The post manualized *Yoga* intervention program intervention group showed a reduction in behavior maladaptive in irritability, lethargy, social withdrawal, hyperactivity, and noncompliance.
(Radhakrishna , 2010a)	Intervention =6	Case Study	*Yoga* Intervention	Imitation skills	Marked improvements were seen in imitation skills in all the six children who participated in the intervention.
(Rosenblatt et al., 2011b)	N=24	Pre-test, post-test	*Yoga* Intervention	Childhood behavior problem	A movement based program involving dance and *Yoga* showed efficacy in treating behavior and some core features of autism particularly for latency-age children

(L. I. B. R. Taylor & Garland, 2010)	Intervention = 19, Non-Intervention n=10	Two group RTC model	Psycho-Social Intervention	Problem-solving/social skills, Affect/anger management, Psychoeducation, Modelling, Roleplay/practice, Assigning/reviewing homework	Results indicate significant decreases in parent-reported child problem severity (ECBI) from baseline to 8-month follow-up, Parents of children with ASD also reported significantly lower caregiver strain on the CGSLEEP ITEM at 8-month follow-up compared to the baseline assessment
(Harrison, 2004)	N=48	Exploratory study	*Yoga* Intervention	Emotions (anxiety, anger, able to manage negative feelings), self-esteem (confidence), attention (memory,	Post-treatment interviews with the children showed that being able to stop or reduce daily medication was seen as a positive outcome of the SYM program. Significant improvement in the ADHD symptoms.

(Leekam, Prior, & Uljarevic, 2011)	N=3	Multiple baseline designs	Psycho-Social Intervention	Social Initiation, Social Interaction, Repetitive Motor Behaviors	Interobserver agreement checks occurred in each condition and were calculated separately for each behavior repetitive motor behavior, social interaction, and social initiations. Significant improvement was seen in all the three areas of problems.
(Weijer-Bergsma, Formsma, de Bruin, & Bögels, 2012)	N=10	Experimental design lasting 8 weeks	Mindfulness Intervention	Inattentive/hyper	At pre-and post-test, data was complete for adolescents (N=10) And mothers (N=10). One father lived abroad, leaving N=9 fathers. Only N=7 tutors returned the post-test measurement. After training, adolescents' externalizing, internalizing and attention problems reduced, and executive functioning improved

(Porter, 2013)	*Yoga* (n=28)	20 Minute Classroom *Yoga* intervention	*Yoga* Intervention	Increasing ability to focus, motor skills, increase body awareness, induce calming and improve eye contact.	A number of occurrences the student needed to be prompted to stay on task decreased. During the intervention, he increased the amount he was focused on 62%. After the four weeks of the intervention, the student did *Yoga* 29 independently, each morning and data were taken. After this type of practice, he was on task 73% of the time.
(Rosenblatt, Gorantla, Torres, & Yarmush, 2011)	(n=24)	Pre-test, post–post	*Yoga* Intervention	Aggression anxiety Depression Somatization A typically withdrawal Attention problems Conduct problems	And Internalizing), only the BSI showed improvement. Among children in the latency – age group (n=16), all three BASC-2 composite scales were found to be changed No subclass of the other BASC-2 composite scales reached significance using the Bonferroni correction, for the whole cohort. However, for the latency – aged children, the depression subscale of the

(Kenny, 2002)	*Yoga* group N=24	Pre-test, post-test	*Yoga* Intervention	Sensory integration difficulties, physical problems associated with poor motor coordination, body	Significant improvement found in all the deficiencies compared to pre-test values
(Chan, Sze, Siu, & Lau, 2013)	Intervention n=23 Control n=23	Pre-test, post-test	Mind Body Intervention	Social Interaction, Communication, Stereotyped Behavior, Event-related EEG assessment	The results measures showed significant and marginally significant Time (Pre vs Post) by Group (Control v's experimental) interaction effects on the two indices of the TOLD X, i.e., the frequency of rule violation, $F(1,34)=3.25, p=0.08$, the main effect of Time(CCTT-2:$F(1,33)=13.23, p=0.001$, FPT:$F(1,35)=18.05, p=0.00$)

(Behar Miriam, 2006)	Intervention = 6	Pre and Post analysis	*Yoga* Intervention	Various sensitivities, diet, language, the ability to focus, eye contact, socialization, transitioning from one activity to another, motor	Encouraging results in the area of focus, parents reported that their children are able to stay on a task for a longer amount of time. Some of the parents also reported that it is easier for their children to go from one activity to another
(Kijowski, 2008)	Intervention = 1	Pre and post single group	*Yoga* Intervention	Maladaptive Behaviors	Maladaptive behaviors decreased post-intervention.
(Deorari & Bhardwaj, 2017)	*Yoga* =30	Pre and Post	*Yoga* Intervention	Symptoms of ASD	Three months post-intervention, improvement was seen in symptoms of ASD children
(Studnitzer, Allen, 2014)	*Yoga*=7	Pre and Post	*Yoga* Intervention	Sensory Integration	Ten-week *Yoga* intervention improved social and academic engagement, social interaction, bonding and managing a stressful situation.

(Sharma, 2012)	Exp =164, Control=137	Pre and Post	*Yoga* Intervention	High Stress and Low Stress	Significant results of.01 level of confidence for both High Stress and Low-Stress groups
(Purohit, Pradhan, & Nagendra, 2016)	*Yoga*=40, Control=30	Pre and Post	*Yoga* Intervention	Loneliness and Social Dissatisfaction	Significant of p=. 001 post-intervention of the *Yoga* group compared to the wait-listed control group. Within the analysis of both, the group showed significantly
(Gothe, Pontifex, Hillman, & Mcauley,	Intervention =30	Repeated measures design	*Yoga* Intervention	Executive Function	Results showed that cognitive performance showed significant value post-intervention compared to aerobic exercises.
(Verma, Shete, Thakur, & Kulkarni, 2014)	*Yoga*=37, Control =34	Pre and Post	*Yoga* Intervention	Cognitive Developmental variables. Mental ability and Memory	Significant result was observed in measures of mental ability and memory in the *Yoga* group after the intervention but now changes seen in the control group

(Praful M Barvalia, Piyush M Oza, Amit H Daftary, Vijaya S Patil, Vinita S	N=60	Pre and post	Homeopathy Intervention	Neuro-Psychological Dysfunctions, Hyperactivity, Impulsiveness	Post 1-year treatment with Homeopathic treatment significant results found in reduced autistic features. Significant change in behavior, communication, and socialization, sensory awareness with p-value >.0001
(John, 2013)	Intervention =18, Control =17	Pre and Post	Psycho Social Intervention	Cognitive ability	Positive results found with p value >.0001 forYTP1(nail biting) and YTP3 p value >.0001 (fulfilling needs)
(Umeda & Deitz, 2011)	N=2	Single-subject A–B–A–B–C	Psycho-Social Intervention	Classroom Behaviors	Post-therapy no significant results found.

(Hetzroni & Tannous, 2004)		Multiple-baseline design	Psycho-Social Intervention	Delayed echolalia, Immediate echolalia, Irrelevant speech, Relevant speech, and Communicative initiations	Post-intervention all children produced fewer sentences with delayed and irrelevant speech, children engaged in fewer sentences involving immediate echolalia and increased the number of communicative intentions and the amount of relevant speech and the children were able to transfer their knowledge of the natural classroom environment

(Eldevik, Hastings, Hughes, & Jahr, 2010)	Intervention =309, Comparison n=39 Control n=105	Group design studies	Psycho-Social Intervention	Behavioral	Post-intervention behavioral intervention achieved reliably change in IQ (29.8%) compared with 2.6% and 8.7% for comparison and control groups, respectively, reliable change in adaptive behavior was achieved for 20.6% versus 5.7% and 5.1%, respectively
(Juneja, Mukherjee, Sharma, Jain, & Das, 2012)	N=16	Pre and Post	Psycho-Social Intervention	Mean development, Social, expressive, Receptive language quotients, the Childhood Autism Rating Scale (CARS)	Post-intervention significant improvement in the development quotient (p =0.015), Social quotient (p=0.004), expressive language quotient (p=0.03), CARS (p=0.001), and ABC (p=0.014) scores were observed

(Luxford, Hadwin, & Kovshoff, 2016)	Intervention =18, Control n=17	Pre and Post	Psycho-Social Intervention	Social communication	The Post-intervention group showed positive change for a parent, teacher, and self-reported anxiety symptoms, and more marginal effects of increased teacher-reported social responsiveness compared to the wait-list control group.
(Hanney, Jostad,	Intervention =30	Pre and Post	Psycho-Social Intervention	Toilet training, urine incontinence	Positive results were seen post-intervention in both toilet training and urine incontinence