

# A Comparative Study of Children with Autism Spectrum Disorders (ASD) in China and the United States: Diagnosis, Treatment and Educational Services

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## ABSTRACT

Autism Spectrum Disorder (ASD) is a group of pervasive neurodevelopmental disorders that originate in early childhood. There are more than 10 million autistic people in China and the number of autistic children is estimated to be growing by nearly 200,000 a year. Such a large number puts great pressure on the country's efforts to provide rehabilitation support and educational services for children with ASD. This paper compares the status of ASD between China and the United States in terms of diagnosis, treatment and educational services. The estimated prevalence of ASD is much lower in China than in the United States. However, there are concerns that the prevalence of ASD is underestimated in China due to the lack of a systematic framework for diagnosing autism. Similar to in the United States, treatment methods, such as behavioral intervention, sensory intervention, therapies and comprehensive interventions are also used to treat ASD in China. In addition, traditional Chinese medicine therapies such as oral Chinese medicine, acupuncture, massage have also been applied to the treatment of autism to relieve the clinical symptoms of children with ASD. Compared to the United States, there are fewer educational services provided to children with ASD and there are insufficient training capacities and a lack of teachers to provide special education to autistic children in China. The government should increase support for special education services for children with autism, so that children with autism can receive a good education, develop independent survival ability, and reduce the pressure and burden on families of children with autism.

**Keywords:** Autism Spectrum Disorders, Diagnosis, Treatment, Educational Services

## 1. INTRODUCTION

Autism Spectrum Disorder (ASD) is a group of pervasive neurodevelopmental disorders that originate in early childhood. People with Autism are characterized by difficulties in social communication, and they usually have restricted and repetitive behaviors, interests, or activities. The number of children across the world that are being diagnosed with ASD is increasing year over year. The United Nations estimates that more than 70 million people worldwide are living with autism. To improve public awareness of ASD, the United Nations approved April 2nd as World Autism Awareness Day (WAAD).

Autism was first introduced by Kanner in his paper on early infantile autism [1]. In China, the first case of an official diagnosis of autism was reported about 40 years

later in 1982. Tao reported the first four cases of Chinese early infantile autism in English [2]. Since then, people have become aware of autism, and the number of children diagnosed with autism is growing significantly in China.

According to the first Report on the Development of Autism Education and Rehabilitation Industry in China released in April 2015, there are more than 10 million autistic people in China, including more than 2 million children aged 0 to 14. The number of children diagnosed with autism has increased by more than 100 times in the past 20 years and the number of autistic children is estimated to be growing by nearly 200,000 a year [3]. Such a large number puts great pressure on the country's efforts to rehabilitate autistic patients.

There are many challenges we are facing in terms of ASD diagnosis, treatment, and the education services provided to children with ASD in China. Western countries, such as the United States have more experience

in diagnosing, treating, and supporting children with ASD. By comparing the status quo of diagnosis, treatment, and education services for ASD in China and the United States, we can learn from them and adopt interventions and support methods tailored to China's national conditions.

## 2. PREVALENCE & DIAGNOSIS

According to the latest report from the Centers for Disease Control and Prevention (CDC), the prevalence of ASD among children aged 8 years old is estimated to be 1 in 44 in the United States, a significant increase from 1 in 150 in 2000. The report has also shown that autism is much more common among boys than girls. The ASD prevalence in boys was about 3 times higher than the prevalence in girls [4].

The estimated prevalence of ASD is much lower in China. According to Zhou, H., et al. (2020), the estimated ASD prevalence rate is 0.70% among children aged 6 to 12 years in China. From the statistics, it seems that the Chinese is less likely to be affected by this neurodevelopment disorder than American. However, there are concerns that the prevalence of ASD is underestimated in China. The authors suggested that the cultural heritage and the level of awareness of ASD might have impacts on the underestimates of the estimation of the prevalence of ASD. Some parents may worry about discrimination if their children are diagnosed with autism. In addition, the study also shows that the prevalence rate in boys is 0.95%, which is significantly higher than that of 0.30% in girls [5]. This finding is consistent with the findings in the U.S. CDC report [4].

Another reason that caused the underestimation of the ASD prevalence rate in China is that there is no routine neuropsychological screening for children in China. Only when the child's parents notice significant cognitive, communication and social abnormalities will they take the child to the doctor. If parents do not take their children to a doctor, these autistic children will not be tested and diagnosed. Many parents think their children will grow out of it.

It is difficult to diagnose autism spectrum disorder (ASD) because there is no medical test available to diagnose ASD. As the biological markers of ASD have not yet been found, the screening and diagnosis of ASD are mainly based on the behavioral characteristics and developmental history of children [4]. The diagnosis of autism relies on the expertise of a trained specialist. Specialists observe children, give them structural tests, ask parents or caregivers questions, or have them fill out questionnaires. Based on the results of the evaluation, the specialist will determine whether the child needs special treatment or early intervention services, or both.

Early diagnosis of autism directly affects whether autistic children can receive intervention and

rehabilitation as early as possible. Since the earliest symptoms of ASD appear in the first year or two of life, the American Academy of Pediatrics recommends universal screening of young children for ASD at 18 and 24 months [6]. Early screening and diagnosis of ASD increase children's chances of benefiting from early intervention.

According to the latest report from the Centers for Disease Control and Prevention (CDC), on average, the age at the earliest evaluation of ASD is about 2-3 years old in the United States. The age at the earliest known diagnosis is about 4 years old. Children with ASD and lower IQ (IQ score less than 70) are more likely to be evaluated and diagnosed at an earlier age [4]. This is reasonable since parents are more likely to detect the children with ASD and lower IQ. On the other hand, the diagnosis of children with normal or high IQ is difficult due to the complexity of the symptom.

According to Wang, F., and Yang, G. (2017), most of the parents (51.4%) in China were able to detect their children's abnormal symptoms early at the age of 2 ~ 3. However, most of the children (63.8%) were diagnosed at the age of 3 to 4, and the actual rehabilitation intervention began at the age of 4 to 5 [7]. This is aligned with the age of evaluation and diagnosis data in the United States.

As mentioned in the previous section, there is no routine neuropsychological screening for children in China. The diagnosis of ASD relies solely on parents' judgment and financial ability to decide whether or not to bring their child for autism screening and diagnosis. As a result, children with autism typically exhibit moderate to severe symptoms. Many children with mild autism in kindergartens and schools went undiagnosed. When those children displayed behavioral challenges, they are often regarded as naughty, abnormal personalities, rather than being considered as having disorders.

In addition, the lack of autism experts and the lack of a systematic framework for diagnosing autism make it difficult to correctly diagnose people with autism in China. On the other hand, psychiatrists are cautious about diagnosing children with Autism in China since the autistic children are mostly likely to be rejected by public regular schools. Since the public regular schools don't provide special education services in China. So, the psychiatrists tend to diagnose an autistic child as "tending autism" or "autism-like case" to avoid giving the child the label of "Autism" directly. However, it will not be the case in the United States. The autism children can get the special education services in public regular schools in the United States [8]. Most children with ASD can only be diagnosed at specialist clinics in large hospitals in big cities, rather than at local hospitals. This makes the diagnosis of ASD for children in small cities and remote villages more challenging and difficult.

### **3. TREATMENT**

Currently, there is no effective cure for autism. ASD affects people differently, which means that patients with ASD have different challenges, as well as different treatment needs. Current treatments for children with ASD are aimed at finding ways to reduce symptoms that interfere with normal daily living and quality of life. The common treatment methods include behavioral intervention, sensory integration training and therapies, and medication, etc.

#### ***3.1 Behavioral Intervention***

Behavioral intervention aims to change behaviors through understanding what happens before and after behaviors of children with ASD. In the United States, Applied Behavior Analysis (ABA) has been proved to be the most effective treatment available for children with autism [9]. ABA helps reinforce desired behaviors and discourage unwanted behaviors of children with ASD. It was created by a behavioral psychologist, Dr. Ivar Lovas in the 1960s.

Applied behavioral analysis has been widely used in many schools and treatment clinics. It becomes the most widely used therapy for autism in the United States. ABA treatments focus on improving the autistic children's skills by encouraging desired behaviors and discouraging undesired behaviors. The progress of the autistic children's behaviors is tracked and measured.

ABA treatment was rarely used to treat children with autism in China before due to the lack of professionals or researchers who have expertise in ABA. Most rehabilitation training uses sensory integration training and various relaxation training, such as massage, music and play therapies. However, the efficacy of such treatments has been questioned by some western researchers. In recent years, researchers and professionals have realized this and learned how to use these techniques to treat autistic children in China. ABA treatment is becoming available to an increasing number of autistic children. Behavior intervention ABA has become a common intervention method used for autistic children in China. For example, Wang, F., and Yang, G. (2017)'s study showed that among all the intervention methods used, the behavior intervention accounted for about 31%, followed by sensory integration training, accounting for about 25% [7].

#### ***3.2 Sensory Integration Training and Therapies***

Children with ASD may have sensory integration disorders that refer to sensory inputs are not integrated or organized appropriately in the brain and may result in problems in information processing and abnormal behaviors. One or more senses are either over-reactive or

under-reactive to stimulation, which might cause the behaviors such as rocking, spinning, and hand-flapping. The purpose of sensory integration training is to help the children to improve responses to sensory input and manage either restrictive or overwhelming behaviors. Sensory Integration treatment is commonly used with children with ASD in the United States. Studies have shown the effectiveness of sensory integration treatment in reducing the stereotyped or self-stimulatory behaviors in children with ASD [10].

Sensory integration training and related therapies were the most common treatment methods for autistic children in China in the early 2000s [11]. Although more and more behavioral interventions have been promoted in China. Sensory Integration training and various therapies still account for a significant proportion. As previously mentioned, Wang, F., and Yang, G. (2017)'s study showed the sensory integration training accounts for 25% among all the intervention methods used in the studied group of autistic children [7].

There are various types of therapies available, including play therapy, music therapy and massage therapy. Clinical application has confirmed that music therapy plays a positive role in the rehabilitation of ASD. In the intervention of ASD music therapy, children can effectively activate their innate musical ability through visual, auditory, tactile and other sensory experiences, thus stimulating their learning potential in the process of rehabilitation [12]. Music makes children with ASD overcome intellectual defects and feel the happiness brought by music. However, the lack of music therapists and non-standard intervention techniques greatly affect the development of music intervention for children with ASD.

#### ***3.3 Medication***

Because the exact cause of ASD is unknown, ASD is not a simple disorder that can be cured by just taking medication. But some medicines are used to treat co-occurring symptoms of ASD. Some medicines are used to help manage high energy levels, inability to focus, or self-harming behavior of people with autism or help to relieve autistic people's psychological conditions, such as depression and anxiety. In the United States, for example, the FDA has approved antipsychotic drugs, such as risperidone and aripiprazole to treat irritability of children with autism aged 5-12. Other drugs, although not approved by the FDA, are often used to improve some of the symptoms of autism. For example, Tricyclics are used to treat depression and obsessive-compulsive behaviors. Stimulants can help to increase focus and decrease hyperactivity. Anti-anxiety medications can be used to treat seizures and epilepsy. These medicines must be used under the supervision of an experienced doctor. Side effects also need to be monitored and assessed to ensure

that the negative side effects of using these medicines do not outweigh the benefits of taking them.

In China, traditional Chinese medicine therapies such as oral Chinese medicine, acupuncture, massage, auricular point seed-pressing therapy and its combination therapy have also been applied to the treatment of autism to relieve the clinical symptoms of children with ASD. Lv et. al. (2020) tracked the effect of taking Traditional Chinese medicine to treat autism in 34 children diagnosed with autism. Their study showed that the children's symptoms of language skills, social communication and stereotypical behavior improved significantly after taking traditional Chinese medicine for a period of time [13]. In recent years, the use of acupuncture has become a popular form of treatment for children with autism. Hui, J. et al. (2020) showed that acupuncture achieved good results in treating children with autism. It suggested that acupuncture could promote the growth and development of nerve fibers and improve the attention of children with autism [14].

### **3.4 Comprehensive Intervention**

Comprehensive Intervention refers to the comprehensive use of various intervention methods and technologies, aiming at improving the multiple defects of autistic children, so as to improve the overall development level of autistic children. In the United States, the comprehensive intervention has become a growing trend in autism intervention and education. In the field of practice, more and more emphasis is placed on the leading role of children, the intervention role of parents and the professional intervention personnel, and more and more attention is paid to the importance of early intervention.

In China, more and more researchers are paying attention to the effectiveness of the comprehensive intervention method. For example, Cai et.al. (2018) studies the comprehensive intervention that combines sports training, voice training, cognitive training, game training, self-care training, art training and computer game training. Cai et.al. (2018)' s study shows that comprehensive intervention can significantly improve the abilities of children with autism [14].

## **4. EDUCATIONAL SERVICES**

In the United States, there are clear laws supporting the right of children with autism to receive education services. The Individuals with Disabilities Education Act (IDEA) was amended in 1990 to include autism in the scope of special education services, providing children with autism spectrum disorders (ASD) with the right to free and appropriate public education, including educational guidance and related services.

At present, China has no separate legislation on autism spectrum disorder and the corresponding educational rights of children with ASD. It is difficult for children with autism to go to public regular schools. There is no individualized educational program available for children with ASD in public regular schools. Some children with autism go to public special schools, however, such schools are mainly located in cities. Children in remote rural areas have limited or no access to public special schools.

Most autism rehabilitation services providers in China are private institutions, lacking professional guidance and supervision. There are more than 2 million autistic children in China, and the number is increasing by nearly 200,000 every year. The service capacity of Education and rehabilitation institutions in China is seriously inadequate, and most children cannot receive formal rehabilitation training and intervention. In addition, rehabilitation institutions mainly focus on the education and rehabilitation of children from 0 to 7 years old, and the needs of intervention services after 7 years old and older people cannot be met [16].

The good news is that the number of rehabilitation institutions has continued to grow in recent years. According to the first Report on the Development of Autism Education and Rehabilitation Industry in China III released in April 2019, the number of autism rehabilitation institutions increased from more than 1,600 to 1,811, an increase of 12%. The service capacity has increased from serving less than 200,000 students to serving more than 300,000 students, increasing by 30%. The number of employees increased from less than 30,000 to more than 50,000, an increase of 40%; The distribution of institutions has gradually developed from concentrated in the developed areas of big cities to all over the country [16].

However, there is still a huge gap between the number of autistic children and the capacity of institutions to serve them. Many autistic children are left at home by their parents due to the shortage of resources and financial difficulties. Relevant government departments should speed up the development of relevant support policies so that more autistic children can enter appropriate institutions to receive educational intervention and return to ordinary schools as soon as possible.

## **5. DISCUSSION**

At present, China has no separate legislation on autism spectrum disorder and the corresponding educational rights of children with ASD. Government should promote legislation on autism because the improvement of laws and regulations plays a very important role in promoting the social integration of autism.

In terms of rehabilitation training in China, there are problems of insufficient training capacity and lack of teachers. At present, there is no college or university in China that can train autism rehabilitation trainers [16]. The training of professional teachers mainly depends on rehabilitation institutions, which is far from meeting the needs of autistic people. It is hoped that the government can give more support to the training of teachers for autism rehabilitation and provide policy support to the training schools run by private institutions. In addition, unscientific autism interventions are still widely used. There are many autism interventions that lack evidence-based support. Researchers and professionals should actively study and promote fully evidence-based interventions, which are the most effective methods.

It is worth mentioning that the rehabilitation and employment problems faced by older autistic children (aged 16 and above) are very serious. There are very few institutions that can provide them with proper education. And the government subsidies they receive for the education of autistic children expire because they are too old. At the same time, there is no sufficient supporting vocational training to help them live independently and integrate into society. These should receive the attention and policy support of the state and government.

## 6. CONCLUSION

In the United States, children with ASD have received a lot of attention and support from society. The relevant laws issued by the national government provide an institutional basis and legal basis for the fairness of education for autistic children. There are a large number of well-functioning service institutions, making it practical and feasible for autistic children to receive regular education, integrate into society and return to normal life.

China has a late start in autism research, the first case of an official diagnosis of autism was reported in 1982, which is 40 years later than that in the United States. The early screening of autism also lacks systematic methods and regulations, requiring government policy support and social attention. In terms of the intervention and treatment of autism, China should increase research input in the intervention and treatment of autism. While learning advanced western experiences, we should carry forward the treatment with Chinese characteristics, such as traditional Chinese medicine and acupuncture. In addition, in the rehabilitation process of autism, the leading role of children should be emphasized and the participation of parents of autistic children should be increased. The government should also increase support for special education services for children with autism, so that children with autism can receive a good education, and provide places for children with autism to learn knowledge and survival skills, so as to reduce the pressure and burden of families of children with autism.

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