

Unlocking Potential: The Impact of Physical Therapy on ASD and ADHD Care

Maheshkumar Baladaniya^{1*} and Shraddha Baldania²

¹Physical Therapist Neighborhood Physical therapy PC Brooklyn, NY, USA

²Exercise Physiologist, Enjoy Rehab PT, PC. Woodbury, NY, USA

ABSTRACT

This white paper highlights the critical role of physical therapy in the lives of children diagnosed with Autism Spectrum Disorder (ASD) and Attention Deficit Hyperactivity Disorder (ADHD). The review encompasses diagnostic insights, prevalence considerations, and nuanced clinical perspectives. Emphasizing the crucial role of occupational therapy, it elucidates strategies spanning sensory processing, motor skill development, and adaptive techniques. A core theme advocates for collaborative, multidisciplinary practices involving physical therapists, medical professionals, educators, and caregivers. The synergistic efforts of these stakeholders are highlighted, aiming to craft individualized and holistic treatment plans. Furthermore, the review underscores physical therapy's impact on fostering independence and self-confidence in affected children. Through illustrative case studies, this synthesis contributes to the evolving landscape of pediatric neurodevelopmental care. The overarching objective is to champion a paradigm shift towards holistic interventions that address the interconnected facets of physical, cognitive, and emotional well-being. In envisioning an inclusive future, this review advocates for the empowerment of every child, regardless of their neurodevelopmental profile, to realize their fullest potential.

*Corresponding author

Maheshkumar Baladaniya, Physical Therapist Neighborhood Physical therapy PC Brooklyn, NY, USA.

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Index Terms

Autism Spectrum Disorder (ASD), Attention Deficit Hyperactivity Disorder (ADHD), Unique challenges, Neuro-developmental disorders

Introduction

Children with Autism Spectrum Disorder (ASD) and Attention Deficit Hyperactivity Disorder (ADHD) often experience complex physical and developmental challenges. Physical therapy plays an indispensable role in addressing these challenges, enhancing their motor skills, social interactions, and overall quality of life. This white paper underscores the significance of physical therapy in supporting children with ASD and ADHD. In the initial section, we delve into the clinical nuances, diagnostic complexities, and prevalence statistics surrounding ASD and ADHD. This foundational exploration sets the stage for an in-depth analysis of therapeutic interventions in the second section, where the focus is primarily on the role of occupational therapy. Addressing sensory processing challenges, motor skills development, and adaptive strategies, this section illuminates targeted interventions crucial for enhancing the quality of life for children grappling with ASD and ADHD. Moving forward, the narrative seamlessly transitions into the collaborative care and multidisciplinary approach presented in the third section. Here, the synergy of physical therapists, medical professionals, educators, and caregivers takes center stage.

Emphasizing the significance of collaboration, this section underscores the creation of holistic treatment plans tailored to the unique needs of each child. Furthermore, it accentuates the role of physical therapy in promoting independence and self-confidence,

showcasing how such interventions unlock the full potential of children facing neurodevelopmental challenges.

Within this scholarly tapestry, the synthesis of these sections calls for a paradigm shift in the conceptualization and execution of care for children with ASD and ADHD. The overarching theme advocates for a holistic perspective where collaborative and multidisciplinary approaches converge to nurture the physical, cognitive, and emotional dimensions of each unique individual.

As we traverse this scholarly landscape, the aim is not merely to elucidate existing knowledge but to contribute to the evolving narrative of pediatric neurodevelopmental care. By shedding light on transformative interventions and insightful case studies, this literature review seeks to propel the field towards a future where every child, regardless of their neurodevelopmental profile, can thrive and realize their full potential.

Epidemiology

Autism affects around one out of every hundred children worldwide. This number is an average because the stated prevalence varies greatly between studies. However, several well-controlled investigations have revealed far higher values. The frequency of autism is unknown in a number of countries with middle and low incomes. ADHD has been diagnosed in millions of children in the United States.

According to a countrywide poll of parents¹, the anticipated number of children aged 3-17 years who have ever been diagnosed with ADHD is 6 million (9.8%) using data from 2016 to 2019.

This figure - 2 includes,

- 3-5 years: 265,000 (2%)
- 6-11 years: 2.4 million (10%)
- 12-17 years: 3.3 million (13%)

Boys (13%) are more often than girls (6%) to be diagnosed with ADHD [24]. According to CDC estimates from 2010, one in every hundred children in the United States has Autism Spectrum Disorder.

Over time, the Number of US Children who have Received an ADHD Diagnosis has Varied

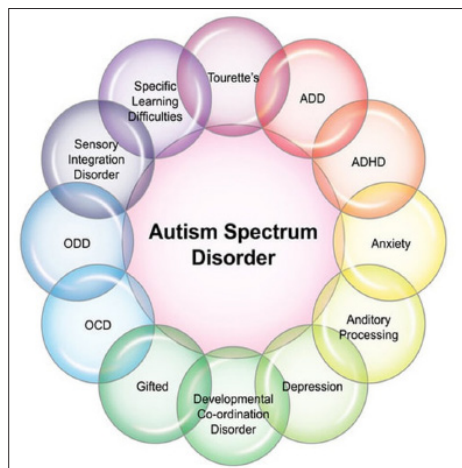


Figure 1: Navigating the Complexity of Mental and Physical Health Challenges in Autism Spectrum Disorder (ASD) [24].

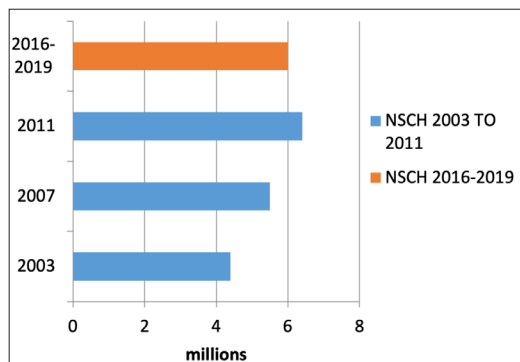


Figure 2: Children (3-17 years old) who were ever Diagnosed with ADHD Comprise 1 in every Million.

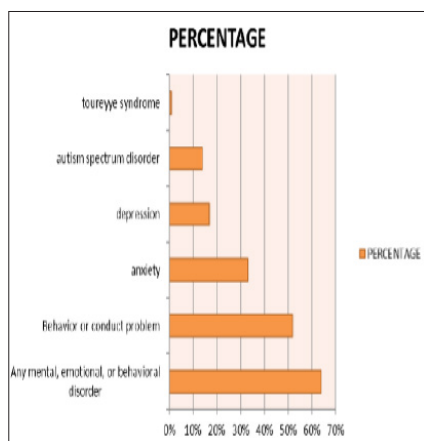


Figure 3: Percentage of Children with ADHD who had at Least one Other Disorder

Understanding ASD and ADHD

A. Define ASD and ADHD and provide an overview of their characteristics and symptoms

Autism and attention deficit hyperactivity disorder (ADHD) sometimes reflect each other. Children with both conditions may have difficulty concentrating. They may be impulsive or have difficulty communicating. They could have trouble in both social and academic settings. **Autism spectrum disorders** are a group of developmental problems that affect language skills, behavior, socialization, and learning ability.

ADHD is a common disorder that can affect your ability to concentrate, stay still, or think before acting. Keep an eye on your child's attention focus. Children with autism have difficulty focusing on activities they dislike, such as reading a book or working on a puzzle. And they may become fixated on something they enjoy, such as playing with a specific toy. Children with ADHD frequently dislike and avoid tasks that require concentration [1]. They frequently struggle to put their thoughts and feelings into words. They may also be unable to point to an object to provide meaning for their remarks. They have difficulty making eye contact.

In contrast, a child with ADHD may talk constantly. They are more likely to interrupt when others are speaking or to butt in and try to take over a conversation. Some autistic children can chat for hours about a topic that interests them.

Early diagnosis allows youngsters to receive the appropriate treatment and avoid missing out on critical developmental and learning opportunities. People with these conditions can have fulfilling lives [2].

Discuss the Unique Challenges and Needs of Children Diagnosed with these Conditions

Children with ADHD frequently struggle to focus on a single activity or task. They may be easily sidetracked when engaged in their normal responsibilities. Children with ADHD often struggle to finish a single task before moving on to the next, and they are frequently physically unable to sit still. However, some children with ADHD may become fixated on a topic or activity and hyper focus on it.

Children with ASD are likely to be overly concentrated, and unable to shift their focus to the next task. They are frequently strict in their habits and have a low tolerance for change. This could include taking the same route and eating the same foods every day. Many people are either extremely sensitive or insensitive to light, noise, touch, pain, smell, or taste, or they have a significant interest in them. They may have predetermined food preferences based on color or texture, and they might show behaviors such as frequent hand flapping. Because of their intense focus, people with ASD are generally able to memorize specific data for long periods and may excel in math, science, art, and music [3].

More than half of individuals diagnosed with ASD also have symptoms of ADHD. The most common associated condition in children with ASD is ADHD. On the other hand, up to a quarter of children with ADHD display low level ASD symptoms, such as problems with social skills or being too sensitive to garment textures.

According to research, 50 to 70% of people with autism spectrum disorder (ASD) also have comorbid attention deficit hyperactivity disorder (ADHD). This high proportion of co-morbidity is interesting from a clinical standpoint.

Introduce the Role of Physical Therapy in Addressing these Challenges

It is essential to ensure that a child's developmental delays in behavior, communication, and social interactions do not compensate for an inability to use gross and fine motor abilities. Assessment and treatment of motor deficits should be part of autism treatment. Physiotherapists must include autism diagnosis when developing structured treatment programs so that children with autism can be taught to feel comfortable with their bodies and competent in their activities. Including physiotherapy in autism therapies has helped to improve (and lessen the severity level of) weak muscle control in children with autism, which in turn helps to reduce future injuries and build confidence in doing tasks.

Physiotherapy can be an important part of treating motor deficits in children with ASD and ADHD. The physiotherapist will collaborate closely with parents/caregivers and others involved in the individual's care to ensure that they benefit most from therapy. Physiotherapy seeks to enhance an individual's physical ability to its full potential in school, at home, and in educational settings.

A physiotherapist in Pediatrics will examine the child's general motor performance, identify the root causes, and propose an intervention program to help address or enhance these challenges, and therefore the child's overall functioning. Physical training programs, hydrotherapy, range of movement exercises, recommendations, techniques, and strategies are some of the physiotherapy therapies that can be utilized to target the areas mentioned above [4].

The Expertise of Pediatric Physical Therapists

The developmental delays may have an impact on the children's gross and fine motor skills. The goals of physiotherapy are to collect information from parents, clinical physicians, and other members of the multidisciplinary team. The physiotherapist's role is to care for autistic children who have motor impairments in their bodies (for example, issues with respiratory control and coordination level, improvement in posture, and addressing misalignment in the musculoskeletal system including chest wall deformities and foot and ankle misalignment issues).

Assessments and Treatments are typically conducted in a variety of locations (for example, at home, daycare, community centers, clinics, hospitals, rehabilitation centers, and fitness centers). Physiotherapists are also involved in rehabilitation after injuries, such as when a child sustains a fractured limb and requires rehabilitation therapy. However, when developing treatment sessions, physiotherapists must consider the autism diagnosis. This is owing to the fact that many physiotherapy sessions are very organized. Teaching people to be comfortable and competent in their own bodies is an important aspect of the treatment.

Age-appropriate physical and motor skills, such as jumping clapping hands, skipping, hopping, and combing, kicking, or catching a ball, are included in exercise-based physiotherapy treatments. One cause for the poor participation rate in Physical Education (PE) for children with ASD (53%) and ADHD (38%), could be challenges with primary diagnosis and associated motor deficits. According to Cairney et al. (2005), children with DCD

are less likely to be physically active.

Children with ASD have poor motor performance, hence early intervention programs that focus on motor development are recommended. Physiotherapists can assist children to develop functional motor abilities to compensate for motor skill deficits.

It has been stated that there is a need for better-tailored (Physical Education) PE for children with neuropsychiatric disorders, with a sense of self efficacy and physical fitness. When it comes to helping someone with autism, positive reinforcement can be a very effective strategy. Praise your loved one for their accomplishments, no matter how minor, can help them develop self-esteem and confidence. It can also inspire them to try new things and take on new challenges [5].

The Expertise of Pediatric Physical Therapists

Each diagnostic technique for autism requires different conversations, observations, and field-specific examinations, and is carried out by autism-specialized psychologists. The goal is to gain as complete an image of the individual as

possible and to evaluate the person in his or her various environments.

- Autism examination to establish if a person has autism
- Assessment of a person's abilities
- Suggestions for concrete and tailored educational initiatives, as well as assistance for parents in putting them into action
- Medical examination

The majority of diagnostic assessments are performed in collaboration with an outside medical psychiatrist who is primarily responsible for medical considerations.

All of the information gathered from the evaluations is then shared, analysed, and reviewed in order to decide whether the individual has autism. This diagnosis is based on the most up-to-date international diagnostic standards [7].

Sensory and Psychomotor assessments specific to people with autism can be arranged, with tests and equipment accessible for care providers to employ. Following an evaluation by the group's psycho-motor specialist, families are given advice, tactics, and customized support. Psychomotor skills are also made useful to groups and families of all ages.

There are several treatments available to assist children with ASD in learning new skills and overcoming a variety of developmental challenges. These treatments aren't meant to cure ASD. Instead, they help your child enhance his or her capacity to socialize and play, perform academically, and navigate daily life with adaptive abilities.

There is a dizzying variety of therapies and approaches available for early autism treatment. Some autism therapies are aimed at lowering troublesome behaviors and improving communication and social abilities, while others address sensory integration issues, motor skills, emotional concerns, and food sensitivities.

With so many options, it is critical to conduct research, consult with autism treatment professionals, and ask questions. However, keep in mind that you are not required to select only one sort of therapy. Autism treatment should aim to address your child's specific symptoms and requirements. This frequently necessitates a multifaceted treatment strategy involving multiple types of therapy.

Behaviour Therapy, speech-language therapy, play-based therapy, physical therapy, occupational therapy, and nutritional therapy are all common autism therapies. However, keep in mind that the routine is essential, and the program should be developed in such a way that it can be maintained. Consider which skills and habits are most important and prioritize their treatment. It's probable that you won't be able to tackle everything at once.

Anxiety: ASD children may have significant anxiety or conditions such as obsessive-compulsive disorder (OCD). Anxiety can contribute to social difficulties or undesirable behaviors such as outbursts. However, there are numerous methods for dealing with anxiety. Teaching your youngster to recognize anxious feelings is one useful method. Exposing them to the source of their worry gradually in a safe environment may also assist [6].

Early Intervention and Developmental Milestones

Early intervention is specialized help for disabled children and teens, autistic children and teenagers, and children and teenagers with other special needs. Early intervention should begin as soon as your child's requirements are identified. It could include therapies, assistance, education, and so forth. Early intervention frequently focuses on four main aspects of a child's development:

- **Physical development** refers to the growth of children's bodies and brains.
- **Cognitive development** is the process by which children think and learn.
- **Behavioral development** is the study of children behavior and how it is influenced by physical and cognitive growth.
- Children's ability to build relationships and manage emotions is referred to as **social and emotional development**.
- Early intervention therapies address these areas of development in a variety of ways. As an example:
 - Fine motor skills, play, and self-help abilities such as dressing and toileting can all benefit from occupational therapy.
 - Balance, coordination, and gross motor skills such as sitting, crawling, and walking can all benefit from physiotherapy.
 - Speech therapy can aid in the development of speech, language, and feeding and drinking skills like chewing, sucking, and swallowing.
 - Psychological treatment can aid in the formation of relationships, the management of emotions, and the development of behavior, social, and other skills.

Height and weight are not the only developmental milestones that parents and caregivers should keep track of from birth to five years of age. Another significant developmental milestone includes how a child speaks, plays, acts, and learns. Early diagnosis of developmental deficits is crucial for children on the autistic spectrum. Children with autism spectrum disorder are more likely to enroll in normal kindergarten classrooms, learn the skills needed to expand social opportunities and realize their full potential throughout their lives if they receive early detection and intervention.

The most important purpose for monitoring each child's growth is to assess whether or not the child is on track. It is critical to look for developmental milestones to understand each child's development and behavior [8,10]. Milestones assist in explaining a child's behavior. If a 1-year-old tears as her father leaves the classroom in the morning, she is exhibiting a typical 12-month milestone that indicates good growth.

- Pretending to be someone else during play (teacher, superhero, dog) can be both a social/emotional and a cognitive milestone.
- Following directions can be both a language/communication and a cognitive milestone.
- Playing peek-a-boo can be both a cognitive and a social/emotional milestone.

Motor Skills Development

Because of the motor difficulties that children with ASD face during their developmental period, physiotherapy treatments and instruction are important. The treatments have been effective in reducing and decreasing the severity degree of their poor muscular control, which can lead to a variety of serious complications as they develop if left untreated.

Physiotherapists should use based on play treatment and exercise therapies to encourage children to feel confident and comfortable with their bodies. This will result in better outcomes for many children with ASD in the future.

Physical Therapy that Enhances Motor Skills Development

Hydrotherapy for Children with ASD: According to several studies, hydrotherapy can be a good type of exercise for autistic children. Furthermore, children with Autism can benefit considerably from exercise-based physiotherapy.

Hydrotherapy has been commonly used to treat Autistic people. This is normally done in a swimming pool. An autistic youngster can be relaxed by the pressure and temperature of water pressing against his or her body. While the child performs activities designed to improve range of motion and overall mobility, water as a property form can provide a claiming sensory input. Warm water can reduce body weight by 90%, minimize impact force on the body, relax muscles, and minimize spasticity, making it the ideal medium for body rehabilitation [5].

Motor Control Difficulties in Children with ASD: Here are some children with weak motor abilities before the age of seven who do not have a definite neurological condition. According to DSM criteria, some of these youngsters may have Developmental Coordination Disorder (DCD). However, it appears that the vast majority of children with DCD are diagnosed after they begin school. Poor motor performance at preschool age is regarded as one of the first clear symptoms of additional comorbidity for developmental problems such as ASD or Attention Deficit Hyperactivity problem (ADHD) in some circumstances.

Although motor problems can arise on their own, they are thought to frequently coexist with ADHD and ASD. Motor control issues are common in ASD children. DCD is found in almost half of all people with ASD and ADHD. Recently, there has been an increase in research into the links between DCD and ASD.

Promoting Physical Education and Fitness for Children with Autism

One cause for the poor participation rate in Physical Education (PE) for children with ASD (53% accompanying motor deficits. According to Cairney et al. (2005), children with DCD are less likely to be physically active.

The United Nations Sustainable Development Goals emphasized the significance of early childhood development in allowing children to attain their full potential, with physical development being the top priority and a vital component for growth. Children

are typically expected to accomplish basic motor abilities such as locomotor (running and leaping), balance (standing on one leg), object control (grabbing, throwing, and kicking), and fine motor activities (using a pencil and scissors). Motor abilities, for example, are thought to provide the foundation for sport-specific skills, and they are predictive of physical activity engagement and have been connected to cognitive outcomes. Poor motor skills have also been linked to childhood obesity, which has been linked to both short and long-term negative health outcomes. It has been stated that there is a need for better-tailored (Physical Education) PE for children with neuropsychiatric disorders, with a sense of self-efficacy and physical fitness. Furthermore, a lack of motor skills may indicate the presence of a developmental or physical issue that requires specialized treatment [5].

Children with ASD have poor motor performance, hence early intervention programs that focus on motor development are recommended. Physiotherapists can assist children in gaining functional motor abilities to compensate for motor skill impairments [8].

A. Discuss Techniques and Exercises to Improve Gross and Fine Motor Skills

Fine Motor Skills are Important for Autistic Children to carry out activities of daily living and to use pens, tablets, and computers. To develop good fine motor skills, autistic children need good core stability and strength in their shoulders and arms. Here are eleven ideas for fine motor activities for autistic children:

- **Use play dough:** Play dough is a great way to strengthen fine motor skills. Children can use their hands to squeeze, roll, and shape the dough. They can also use play dough cutters and tools to create different shapes.
- **Playing with blocks:** Blocks are another great way to strengthen fine motor skills. Children can use their hands to stack, build, and knock down blocks. They can also use blocks to create different shapes and structures.
- **Drawing and coloring:** Drawing and coloring are great ways for children to express their creativity and to develop fine motor skills. Children can use crayons, markers, or colored pencils to draw and color pictures.
- **Cutting:** Cutting is a great way to develop fine motor skills and hand-eye coordination. Children can use scissors to cut out shapes or pictures from paper.
- **Tying and untying shoes:** Tying and untying shoes is a great way to develop fine motor skills and to learn how to dress independently. Children can practice tying and untying their own shoes.
- **Using a fork and spoon:** Using a fork and spoon is a great way to develop fine motor skills and to learn how to eat independently. Children can practice using a fork and spoon to eat cereal, soup, and other foods.
- **Using a toothbrush:** Using a toothbrush is a great way to develop fine motor skills and to learn how to brush their teeth independently. Children can practice using a toothbrush to brush their teeth for two minutes, twice a day.
- **Writing:** Writing is a great way to develop fine motor skills and hand-eye coordination. Letters, numbers, and words can be practiced by children.
- **Using a computer:** Using a computer is a great way to develop fine motor skills and hand-eye coordination. Children can practice using a mouse or touchpad to navigate the computer screen and to click on icons and buttons.
- It is important to make fine motor activities fun and engaging for autistic children. Parents and caregivers can provide

support and encouragement to help children develop their fine motor skills [9,11].

Ten Gross Motor Activities for Autistic Children:

- Marching
- Jumping on a trampoline
- Playing ball
- Balancing
- Riding bicycles and tricycles
- Dancing
- Pretend play
- Box step
- Tunnel crawl
- Obstacle course

B. Activities Aimed at Improving Coordination, Balance, and Motor Planning

Bilateral Coordination is the ability to manage and arrange both sides of the body at the same time, for as stabilizing paper with one hand while writing/cutting with the other. Good bi-lateral integration/coordination indicates that both sides of the brain are communicating and sharing information effectively. Children who struggle to coordinate both sides of their bodies may struggle with daily living tasks (dressing, tying shoes), fine motor activities (banging blocks together, stringing beads, buttoning), gross motor activities (crawling, walking, climbing stairs, riding a bike) and motor tasks (drawing, writing, cutting, catching/throwing).

The ability to coordinate the movement of the eyes with the movement of the hands is referred to as hand-eye coordination. Children with autism may struggle with **hand eye coordination**, but it can be improved by playing with everyday objects of different sizes and shapes, or by using textured toys such as pop tubes [12].

- Hand eye coordination is important for children with autism.
- Playing with everyday objects of different sizes and shapes can help improve hand-eye coordination.
- Textured toys such as pop tubes can also help improve hand-eye coordination, especially for children with poor tactile registration.
- **Musical Toys:** Beating a drum, hitting a bell, or playing a keyboard all require hand-eye coordination. If you don't have any instruments at home, you can use everyday objects such as a wooden spoon and an upside-down saucepan, a plastic bottle filled with rice as a rattle, or silver foil to scrunch.
- **Tongs and Tweezers:** Have your child use tongs or tweezers to pick up small objects, such as beads, cereal, or cotton balls.
- **Nuts and Bolts:** Have your child screw nuts onto bolts or vice versa.
- **Using Scissors:** Have your child practice cutting paper with scissors. Begin with simple shapes and progressively progress to more sophisticated creations.
- **Popping Bubbles:** Blowing and popping bubbles is a fun way to improve hand-eye coordination. You can buy bubble wands or make your own using a straw and soapy water.
- **Rolling Balls:** Have your child roll a ball back and forth to you or to another person. You can also try rolling a ball through a maze or into a container.
- **Throwing into a Container:** Have your child throw beanbags, balls, or other objects into a container, such as a basket or box.
- **Throw and Catch:** Play catch with your child using a ball or beanbag. Start by standing close together and gradually move farther apart as your child gets better at catching.
- **Egg and Spoon Race:** Have your child balance a spoon with an egg on it in their hand and race to the finish line.
- **Painting and Colouring:** Painting and coloring are great

ways for children to express their creativity and improve their hand-eye coordination.

- **Puzzles:** Puzzles are another great way to improve hand-eye coordination and problem-solving skills. Start with simple puzzles and gradually work your way up to more complex puzzles as your child gets better.

Social Interaction and Communication

Physical therapists (PTs) play an important role in supporting children with autism spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD) in developing social interaction and communication skills. PTs can work with children on a variety of skills, including:

- **Joint Attention:** A PT might use a ball to play a game of joint attention with a child with ASD or ADHD. The PT would start by rolling the ball to the child and waiting for the child to roll it back. Once the child is able to roll the ball back consistently, the PT can start to move the ball around the room and encourage the child to follow it with their eyes.
- **Turntaking:** A PT might use a game of Simon Says to help a child with ASD or ADHD develop turn-taking skills. The PT would give the child instructions, such as "Simon says touch your toes" or "Simon says jump up and down." The child would only follow the instructions if the PT started with the phrase "Simon says." This game helps children learn to wait for their turn and to respond to others' actions.
- **Selfregulation:** A PT might teach a child with ASD or ADHD a deep breathing exercise to help them manage their emotions. The PT would have the child sit or lie down in a comfortable position and place one hand on their chest and the other hand on their stomach. The PT would then instruct the child to breathe in slowly and deeply through their nose and to breathe out slowly through their mouth. This exercise helps children to calm down and to focus their attention.
- **Gross Motor Skills:** A PT might help a child with ASD or ADHD develop their gross motor skills by playing games with them that involve running, jumping, and throwing. The PT can also provide the child with opportunities to practice these skills on playground equipment and in other safe and supportive environments.

PTs can play an important role in helping children with ASD and ADHD develop social interaction and communication skills. By working with children to develop specific skills and by providing them with opportunities to practice these skills in a variety of settings, PTs can help children with ASD and ADHD to interact more effectively with others and to participate more fully in their communities.

Sensory Integration and Regulation

A. Role of Physical Therapy in Addressing Sensory Integration Challenges

Physical therapists can support children with ASD and ADHD in developing social interaction and communication skills in a number of ways.

Physical therapists can also teach social skills through play. Play is a natural way for children to learn and develop, and it can be especially helpful for children with ASD and ADHD. Physical therapists can use play-based activities to teach children important social skills such as:

- Turn-taking
- Sharing
- Cooperation

- Following rules
- Managing emotions

Play-based activities can also help children with ASD and ADHD develop their communication skills. Physical therapists can teach children how to use nonverbal communication cues, such as eye contact, facial expressions, and body language. They can also teach children how to use verbal communication skills, such as starting and maintaining conversations, asking questions, and listening to others.

Physical therapists can also help children with ASD and ADHD develop self-awareness and body confidence. This is important because children with ASD and ADHD may have difficulty understanding their own bodies and how they move. They may also have difficulty interacting with others in a physically comfortable way. Physical therapists can also work with families and caregivers to help them support their children's social interaction and communication skills development. Physical therapists can provide families with information about social skills development and strategies for teaching social skills at home. They can also provide support and guidance to families as they help their children navigate social situations.

Techniques in Sensory Integration Therapy

- **Play Based Activities:** The primary medium used in SIT is play. To test the child's sensory processing abilities, occupational therapists create entertaining games that include a variety of sensory stimuli. These activities may involve using swings, trampolines, huge balls, and other sensory input devices.
- **Swinging and Spinning:** Two exercises that are frequently utilized to offer vestibular (balance and movement) input. These activities can help children develop their balance and coordination while also regulating their arousal levels.
- **Deep Pressure Activities:** Deep pressure activities, such as squeezing or enveloping the child in a blanket, give proprioceptive input, which aids in the development of body awareness and calming reactions in the child.
- **Brushing Protocol:** The Wilbarger Brushing Protocol involves applying deep pressure to the child's skin using a soft surgical brush. This approach is thought to increase sensory processing and lessen tactile defensiveness.
- **Weighted Vests and Blankets:** These are used to deliver deep pressure and proprioceptive feedback. They can assist children in being more grounded and focused.
- **Therapeutic Listening:** The use of specially designed music to boost the child's auditory system. It is thought to improve sensory processing and self-regulation.
- **Visual Stimulation:** Visual stimulation activities, such as monitoring moving objects or playing with light sources, can aid improve visual processing and attention.
- **Oral Motor Activities:** Activities such as chewing and blowing bubbles can aid improve oral sensory processing and support speech [13].
- **Effective Communication and Emotional Regulation:** These are essential for everyone, but they are especially important for people with ASD and ADHD.

People with ASD may have difficulty with communication in a number of ways. They may have difficulty understanding and responding to social cues, using verbal and nonverbal communication effectively, and starting and maintaining conversations.

People with ADHD may also have communication challenges. They may have difficulty paying attention, following instructions, and completing tasks. They may also be impetuous and cause others to be interrupted.

Emotional regulation is the ability to manage one's emotions in a healthy way. People with ASD and ADHD may have difficulty with emotional regulation due to a number of factors like Difficulty understanding and responding to their own emotions and Difficulty understanding and responding to the emotions of others.

Sensory Integration and Regulation

The process of organizing and interpreting sensory information from the environment is known as sensory integration. People with sensory integration challenges may have difficulty processing sensory information, which can lead to a variety of problems. Physical therapists can also help children with ASD and ADHD to develop coping strategies for dealing with sensory overload and other sensory challenges. For example, a physical therapist might teach a child how to use a weighted blanket to help them feel calm and focused.

Physical therapy can be an effective way to help children with ASD and ADHD improve their sensory integration and live more fulfilling lives [23].

Sensory-based interventions and techniques are a type of therapy that uses sensory stimulation to help people improve their physical, cognitive, and emotional functioning. Sensory-based interventions are often used to treat people with autism spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD), but they can also be used to treat people with a variety of other conditions, including cerebral palsy, Down syndrome, and sensory processing disorder.

Sensory-based interventions can be used in a variety of settings, including schools, clinics, and homes. They can be used in individual or group therapy sessions. The specific type of sensory-based intervention that is used will depend on the individual's needs and goals.

There is a growing body of research that supports the use of sensory-based interventions for a variety of conditions. For example, studies have shown that sensory-based interventions can help to improve:

- Motor skills
- Attention and focus
- Social interaction skills
- Communication skills
- Emotional regulation
- Academic performance
- Quality of life

A. Activities Aimed at Promoting Sensory Regulation

Sensory Circuit: A sensory circuit is a collection of activities and exercises designed to stimulate the senses while also providing a quiet and soothing setting for autistic children.

Sensory Bottle as a Sensory Activity: A sensory bottle is a container filled with various items. It's simple, but it can provide autistic youngsters with a calming and fascinating sensory experience.

1) **Sensory Box:** A sensory box is a collection of items designed to engage the senses while also providing a quiet and pleasant environment for people with autism.

Sensory Activities for Teens: Nature Walk: Nature walks can help autistic youngsters in a variety of ways. Nature's sounds, fragrances, and movement provide a tranquil and soothing experience that can assist autistic children and teens reduce stress and anxiety levels. Walking over an uneven surface (not to mention leaping on logs or rolling down hills!) gives vestibular (balance) and proprioceptive (body awareness) feedback, which aids in nervous system regulation.

Video Games as Sensory Activities: Games can provide a consistent atmosphere in which your autistic kid feels in control. They can participate at their own pace. Gaming's repetitious and predictable nature can be relaxing to the neurological system. Naturally, this depends on the game, and some games might be stimulating. The greatest games for autistic teenagers are soft and do not demand your child to reach a certain point before saving their progress. Spend time observing and conversing with your teen about their game preferences. Consider the colors, sounds, and length of the game, as well as what will be most beneficial to your youngster.

Musical Instruments or Garage Band: *Sensory Musical Activities:* Learning to play a musical instrument is one of the more complex sensory experiences, and it only works if your child is motivated, but it can provide an array of sensory benefits. The feeling of the instrument in their hands, the movement of their fingers and hands, the sound of the instrument, and the visual cues of sheet music provide mild sensory stimulation.

Swinging: A Therapeutic Activity for Autistic Child: Learning an instrument delivers a rhythm and repetition to the nervous system that can be peaceful and contemplative. Because this is regulated by the teenager, it is the ideal self-regulating sensory activity. If your teen is feeling nervous, they might choose to play a soothing, quiet tune [14].

Collaborative Care and Multidisciplinary Approach

Collaboration between physical therapists, medical professionals, educators, and caregivers is essential for providing comprehensive and effective care to children with ASD and ADHD. Each of these professionals has a unique perspective and set of skills that can be combined to create a holistic treatment plan that meets the child's individual needs.

Physical Therapists can help children with ASD and ADHD improve their motor skills, coordination, balance, and sensory processing. They can also teach children coping strategies for dealing with sensory overload and other sensory challenges. **Medical professionals** can provide medical care and treatment for any underlying medical conditions that may be contributing to the child's ASD or ADHD. They can also monitor the child's progress and provide guidance on medication management. **Educators** can provide appropriate educational support and services to help children with ASD and ADHD succeed in school. They can also work with the child's other professionals to develop and implement individualized education plans (IEPs). **Caregivers** play a vital role in supporting their children with ASD and ADHD at home. They can implement the strategies and recommendations of the child's other professionals and provide a safe and supportive environment.

When these professionals collaborate effectively, they can develop a comprehensive and individualized treatment plan that addresses all aspects of the child's needs. This can lead to significant improvements in the child's overall functioning and quality of life [15,22].

Here are some specific examples of how collaboration between physical therapists, medical professionals, educators, and caregivers can benefit children with ASD and ADHD:

- A child with ASD is having difficulty with self-care skills, such as dressing and feeding themselves. The child's physical therapist can work with the child's occupational therapist to develop a plan to help the child develop these skills. The child's parents can then implement the plan at home.
- A child with ADHD is having difficulty paying attention in class. The child's educator can work with the child's doctor to determine if medication would be helpful. The child's physical therapist can also teach the child strategies for coping with sensory overload and other sensory challenges.
- A child with ASD is having difficulty making friends and participating in social activities. The child's educator can work with the child's parents to develop a social skills training program. The child's physical therapist can also help the child to develop the motor skills and coordination needed to participate in physical activities with other children.

By working together, physical therapists, medical professionals, educators, and caregivers can help children with ASD and ADHD reach their full potential [15].

Promoting Independence and Self Confidence

Depending on the severity of the autism, physical therapy is one of many treatments that children with autism require. Their knowledge enables them to evaluate a child's delayed motor and functional skills [10,5].

Physical therapy can help with:

- Improving and engaging in daily routines at home
- Developing new movement abilities
- Developing improved coordination
- Developing Play Skills
- Improving motor imitation abilities
- Increasing stamina and fitness

A physical therapist can assist your child at both school and at home. He or she should create individualized plans to fit the needs of the child and their family.

Through exercises, physical therapy helps children improve their physical health, range of motion, and coordination. These activities are frequently done at a care facility or at home [16]. **During Therapeutic Play, Encourage Large Quality Movements.** Movement, self-direction, interaction, and other characteristics are used in therapeutic play. Physical therapists can stimulate action with inner motivation to assist autistic children overcome limitations by employing therapeutic play. This has been shown to improve emotional functioning, communication, and parent-child connections.

Support Better Behavior and Mood Children with ASD can show behaviors that are damaging to their daily lives. This has a physical and mental impact on children. Physical therapy can assist these children in overcoming their difficulties with mobility and gross motor abilities. As a result, individuals will be motivated to exhibit improved behaviors and overcome behavioral problems if they retain a positive emotional state and higher emotions.

Increase Confidence in Social Situations Children will have greater social experiences if they behave appropriately in social interactions. This will increase their confidence in future

interactions because they will have a better understanding of what is expected of them. Increased motor functions, such as eye-hand coordination, will also provide children with ASD with the physical skills needed to keep up with peers on the playground and in school settings, allowing them to develop the independence they require to build their confidence.

Provide Special Education and Support to Parents Physical therapists will also educate and encourage parents in their efforts to assist their children when necessary. Participation in physical therapy, like all early interventions, must continue outside of formal sessions. When parents can assist their children in overcoming ordinary challenges, their relationship is strengthened and they gain a greater knowledge of their child [17].

Here are Some Strategies for Building a Positive Self Image and Enhancing Emotional Well-Being for ASD and ADHD Children:

Focus on Strengths and Interests Children with ASD and ADHD often have unique strengths and interests. Identifying and nurturing these strengths can help them feel good about themselves and develop their potential. For example, if your child loves to draw, encourage them to take art classes or join an art club. If they are good at math, help them find ways to challenge themselves and learn more.

Provide Positive Reinforcement When your child does something well, be sure to praise them specifically. This will help them to understand what they are good at and build their confidence. Instead of expressing "good job," offer something like, "I love how you focused on your homework for 15 minutes without getting distracted."

Create Opportunities for Success Children with ASD and ADHD may need more support to succeed than other children. Tasks should be broken down into smaller steps with clear directions. Set realistic expectations and celebrate their accomplishments, no matter how small. For example, if your child is struggling to get ready for school in the morning, break down the process into smaller steps, such as getting dressed, eating breakfast, and brushing their teeth. Then, set a timer for each step and help them to stay on track.

Help Them to Develop Social Skills Children with ASD and ADHD may have difficulty with social skills. This can result in emotions of loneliness and isolation. There are many ways to help your child develop their social skills, such as role-playing social situations, practicing conversation skills, and joining social skills groups.

Provide a Supportive and Loving Environment Children with ASD and ADHD need to know that they are loved and supported, no matter what. Create a safe and predictable home environment where they feel comfortable expressing themselves. Be patient and understanding, and seek professional help if needed [18,20,21].

Conclusion

Pediatric physical therapy is a cornerstone in the care and development of children with ASD and ADHD. By addressing their unique physical, social, and sensory needs, physical therapists empower these children to reach their full potential and lead fulfilling lives. Through early intervention, individualized assessments, and a multidisciplinary approach, physical therapy plays a vital role in supporting children with ASD and ADHD,

fostering their independence, self-confidence, and overall wellbeing.

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