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RESEARCH ARTICLE

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## THE EFFECT OF PHYSICAL THERAPY ON CHILDREN WITH AUTISM AND ATTENTION DEFICIT HYPERACTIVITY DISORDER

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### ABSTRACT

**Introduction:** The benefits of physical activity on the mental health and overall well-being of children, including those with autism and other neurological difficulties, have been widely acknowledged. Studies have reported positive improvements in these areas as a result of regular physical activity. **Research Aim:** This article presents novel findings on the relationship between concurrent physical therapy and the mental health of children with autism, suggesting a significant positive correlation. These results highlight the need for further research to expand our understanding of these associations. **Research Methodology:** Methodologically, a comparative literature review took place in order all the questions and dilemmas of the project to be answered. **Discussion-Conclusions:** This health sciences article covered physiotherapy, examining the effects of the physiotherapeutic intervention on the mental health of children with neurodevelopmental disorders like ADHD and autism spectrum disorders, focusing on stress management and mood and psych emotional status. Children with neurodevelopmental disorders such as ADHD and autism spectrum disorders (ASD) often require physiotherapy and educational interventions to address their motor issues in childhood. Medications can improve poor muscle control which, if unchecked, will have serious consequences as the children age. Treatments have improved muscle control.

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## INTRODUCTION

Recent research suggests that physical activity plays a crucial role in enhancing the mental well-being of children. By acting as a protective factor and promoting resilience, it can have a positive impact on their overall health. In fact, identifying such protective factors has become a major focus of research, with the aim of encouraging healthy lifestyle choices and promoting positive mental health outcomes throughout a person's lifespan (Johnson *et al.*, 2007). In a similar vein, there is a link between regular exercise and reduced depression symptoms. Despite the well-documented benefits of physiotherapy for children with typical neurodevelopment, there has been a significant lack of research on its positive effects on children with

autism and other neurodevelopmental disorders. (Johnson *et al.*, 2007). Physiotherapy for children has been shown to bring a number of psychological benefits, including beneficial effects on the children's sense of self-worth and well-being. Evidence also shows that children who participate in the appropriate form of physiotherapy see improvements in cognitive processes such as increased attention. The potential psychological and cognitive benefits of physiotherapy in children are expected to enhance their overall resilience and provide protection against future life stressors. (Johnson *et al.*, 2007). Emotional, psychological, and social well-being are all components of what is known as mental health. Mental health is important throughout life, from infancy to old age. A person's thoughts, emotions, and behaviour can change over their lifespan if they struggle with mental health concerns. It is important to note that the

World Health Organization (WHO) (2007) defines mental health as "the condition of well-being in which each person successfully copes with life's issues, can work productively, and can actively participate in his social environment, not just the absence of problems or "disorders". Because mental health is not a clearly measurable aim, it is difficult to attain and remains an ideal that each of us seeks to realize. In essence, mental health cannot be quantified. Therefore, the definition is highly valuable from a theoretical aspect; Nevertheless, an in-depth examination is imperative so that it can be transformed into mental health systems, services, and structures. This study must be unique to any country or organisation that aspires to offer these kinds of services since it has to take into account: 1. the multitude of theoretical perspectives and scientific data; 2. the cultural data (culture) of each community (WHO, 2007). Mental health is defined as a state of psychological well-being that enables individuals to effectively manage the challenges of daily life, attain their full potential, engage in productive activities, and make meaningful contributions. It is an essential part of one's health and well-being that contributes to the development of individual and communal potential. Mental health is a fundamental human right for the development of individuals, communities, and society as a whole (Johnson *et al.*, 2007).

In addition to mental disorders and psychosocial disabilities, various mental conditions that are associated with significant levels of discomfort, functional impairment, or the risk of self-harm are also considered to be issues pertaining to mental health. Even though this is not usually or always the case, people who have problems with their mental health are more likely to suffer from lower levels of mental health. Therefore, for individuals tasked with delivering mental health services, the entire and unquestioning adoption of a certain scientific position is insufficient and ineffective. Such an approach fails to take into account the traditions, cultural components, or culture of the other society in which they are implemented. Thus, adopting mental health systems, services, and structures that have been successful in other countries does not guarantee that they will be successful in the country in which they are implemented. It is important to prioritize the improvement of children's mental health, which can be accomplished through the adoption of laws and policies that promote and protect mental health, the provision of support for caregivers, the execution of programs, and the improvement of the quality of life for children who have disabilities (Johnson *et al.*, 2007). Children's mental health is recognized as being distinct from that of adults and as being more multifaceted. This is because of the particular developmental stages that children experience. Child characteristics, such as gender and syndromes, can be used as reliable indicators of a child's overall health and sense of happiness. Problems with a child's mental health can manifest as difficulties in psychological and emotional development, social interaction and behavioral regulation. These challenges are classified as mental health disorders when they are persistent, severe, and cause a decline in functionality. Children's well-being can be improved, and the progression of problems can be mitigated, through the implementation of evidence-based programs and treatments for the promotion and prevention of mental illness.

## RESEARCH METHODOLOGY

This study provides evidence for the existence of positive and substantial correlations between physical therapy and the mental health of children diagnosed with Autistic Spectrum Disorders and Attention Deficit Hyperactivity Disorder, as demonstrated by a comparative literature review. The findings of this study warrant further investigation into these correlations. In addition, in table 1 all the articles used in this article are presented hereby.

## LITERATURE REVIEW

**Autistic Spectrum Disorders:** The umbrella term "autistic spectrum disorders" encompasses a variety of clinical features associated with autism, including Autism, Asperger syndrome, and Pervasive

Developmental Disorder Not Otherwise Specified (PDD-NOS), all of which are classified in the Diagnostic and Statistical Manual of Mental Disorders (DSM). While autism spectrum disorders are widely recognized as neurological developmental conditions with a strong genetic component, their exact etiology remains unclear (Johnson *et al.*, 2007). The history of autism can be traced back to 1943, when psychiatrist Leo Kanner from Johns Hopkins University first characterized the condition. Kanner's observation of a small group of children who exhibited abnormal levels of suspicion and apathy towards people led to the recognition of autism as a distinct disorder. In 1944, pediatrician Hans Asperger independently published an essay that described symptoms similar to those identified by Kanner, but with the exception that the children's linguistic and cognitive abilities were higher. Asperger's essay was published in the same year as Kanner's study, providing important early insights into autism. Today, autism is recognized as a complex neurodevelopmental disorder that affects individuals across the lifespan (Johnson *et al.*, 2007).

The term "pervasive developmental disorder not otherwise specified" (PDD-NOS) is a diagnostic term used when a child exhibits severe and persistent deterioration in social skills, deficits in language skills, stereotypic behaviours, or limitations in interests and activities, but does not meet criteria for autistic disorder or Asperger syndrome. PDD-NOS is also known as "pervasive developmental disorder not otherwise specified" (Johnson *et al.*, 2007). However, significant linguistic retardation is only observed in autistic disorder and pervasive developmental disorder not otherwise specified (PDD-NOS). All autistic spectrum disorders are characterized by limited repetitive and stereotypical behaviours, interests, and activities, as well as a deficit in the ability to socialize; however, significant linguistic retardation is only observed in autistic disorder and PDD-NOS (Johnson *et al.*, 2007). Autism spectrum disorders are thought to affect around six people out of every one thousand people in the world, with a recent trend towards an increase in this rate. This increase may be partly attributed to improved public awareness and the development of more accurate diagnostic tools (Johnson *et al.*, 2007; Escalona *et al.*, 2001). Diagnosis of autism spectrum disorders (ASD) is commonly initiated in children between the ages of 15 and 18 months. The initiation of evaluation is often prompted by parents due to perceived delays in speech development, although impairments in social abilities may be observed prior to this. It is important to note that the prognosis for an individual with ASD cannot be determined with certainty before the age of three, as it is influenced by multiple factors (Johnson *et al.*, 2007).

The conditions comprising the autism spectrum are believed to have a neurodevelopmental basis and a hereditary component. However, the exact etiology of many of these disorders remains unclear due to their complex genetics and varied phenotypic expressions. Family studies have shown that the risk of having a child with an autism spectrum disorder (ASD) in families with one affected child ranges from 5% to 6%, with a higher risk observed in families with two or more affected children (Johnson *et al.*, 2007). The phenotypic appearance of autism spectrum disorders can be influenced by several environmental factors, despite the fact that these disorders are regarded to be genetic. Research has shown that both the age of the father and the age of the mother are important risk factors for having a child who has autism. Because of this, the intricate etiology of many diseases results from the combination of inherited factors and environmental factors (Johnson *et al.*, 2007). Early behavioural therapies have the potential to reduce anxiety and aggression while simultaneously improving social interaction. A delay in the development of vocal articulation, verbal and nonverbal communication, motor abilities, the inability to sustain eye contact, and irritability are all early signs of autism spectrum disorders (Lai *et al.*, 2014).

**Physiotherapy treatments for children with ASD:** Childhood development delays, can negatively impact both their gross and fine motor skills. Physiotherapy involves collecting information from the patient's parents, the treating physician, and any other members of the multidisciplinary team. Physiotherapists are responsible for providing

care for autistic children who have motor disabilities in their bodies (such as issues with breath control and coordination level), improving posture, and treating misalignment in the musculoskeletal system. However, physiotherapy treatments must take the autism diagnosis into account due to the highly structured nature of many physiotherapy approaches (Lai *et al.*, 2014). Children who have autism spectrum disorder have been shown to significantly benefit from participation in physiotherapy and educational interventions aimed at addressing their developmental mobility difficulties. Evidence suggests that physiotherapy treatments can effectively mitigate symptoms of poor muscle control in individuals with ASD. Failure to treat these symptoms can result in significant adverse outcomes later in the individual's life. In conclusion, physiotherapists should implement game-based fitness and therapeutic interventions to promote body confidence in young people. This approach has the potential for many children who have autism spectrum disorder to lead to improved outcomes in the future (Lai *et al.*, 2014).

### Attention Deficit Hyperactivity Condition

Attention Deficit Hyperactivity Condition (ADHD) is a psychiatric disorder that manifests in early childhood, with a prevalence of 5% in children aged 4 to 17 years who continue to have educational, social, and mental health issues during adolescence and adulthood (Matthews *et al.*, 2014). In order to establish the diagnosis of the hyperactive disorder, symptoms in the domains of inattention, hyperactivity, and impulsivity must be present simultaneously in several environments (home, school, etc.) and lead to a decrease in learning, social, and occupational functioning. Symptoms should also be present prior to 12 years of age. Individuals with ADHD are clinically, etiologically, and pathophysiologically heterogeneous, and their basic symptoms, deficits, and comorbidities vary (Thapar & Cooper, 2016). According to European studies (Thapar, 2016), the estimated incidence of ADHD in youngsters in the general population is 3-4%. However, some studies suggest it can be as high as 8-12%. Males are disproportionately afflicted by a condition with a male-to-female incidence ratio of 3 to 4 to 1. ADHD frequently co-occurs with other neurodevelopmental problems, including autism spectrum disorders (Thapar & Cooper, 2016). As with other complicated illnesses, both genetic and environmental factors contribute to the development of ADHD. The relative risk among first-degree relatives is 5 to 9, although twin studies estimate the percentage of heredity to be 76%. Diet, psychosocial status, exposure to environmental pollutants, and other environmental factors appear to be linked to the incidence of ADHD. Low birth weight, preterm birth, smoking and alcohol consumption during pregnancy, maternal stress, and the use of certain drugs are prenatal and perinatal risk factors for ADHD. In terms of prognosis, ADHD is related to early school dropout, low academic achievements, and antisocial behaviour (Thapar & Cooper, 2016).

**Physiotherapy for children with ADHD:** Because of the children's developmental delays, there is a possibility that their large and small motor abilities will be negatively impacted. The role of physiotherapy in this population is to collect information from the child's family, the treating physician, and other members of the interdisciplinary team. Physical therapists are responsible for providing care to children with autism and motor disabilities, including improving respiratory control, coordination, posture, and addressing misalignments in the musculoskeletal system such as chest wall deformities and foot and ankle misalignment issues (Isaksen *et al.*, 2017). Physical therapy examinations and treatments are typically provided at a number of different sites, such as homes, daycare, community centres, clinics, hospitals, rehabilitation centres and fitness centres. Physiotherapists may be consulted for rehabilitation after accidents or injuries, such as fractures requiring therapy. Nevertheless, physiotherapists must take into consideration the diagnosis of ADHD when formulating treatment plans. This is since the vast majority of physiotherapy treatments stick to a predetermined schedule. Building body confidence and promoting physical acceptance is an essential aspect of physiotherapy for children. Children who have attention deficit hyperactivity disorder (ADHD) often have motor abilities and

movements that are perceived as abnormal. A number of these coordination problems can give rise to more complicated learning concerns, such as difficulties with playground and sporting abilities when paired with communication, social skills, and behavioural disorders. Physiotherapy treatments that are based on exercises incorporate the kinds of physical and motor abilities that are suited for patients of a certain age range. These could include activities such as jumping, handclapping, skipping, or hopping, in addition to tossing, kicking, or catching a ball (Isaksen *et al.*, 2017).

The effect of swimming classes on children diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) has been studied by physiotherapists, with evidence suggesting that it leads to a significant improvement in motor skills. Hydrotherapy has also been shown to be an effective form of exercise for children and adolescents with autism. Hydrotherapy as a treatment modality for individuals with autism has gained popularity in recent years and is typically conducted in a swimming pool environment. Immersion in warm water can provide a calming sensory input and may promote range of motion and mobility while reducing body weight and muscle tension. Thus, warm water is considered an ideal medium for body rehabilitation (Isaksen, 2017). Before the age of seven, some children who have no obvious neurological disability still have trouble with their motor skills. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM), it is possible that some of these kids may have a condition called developmental coordination deficit (DCD). Most children with DCD are not diagnosed until after they have already started attending school. One of the earliest indicators of a more serious developmental issue, such as autism spectrum disorder or attention deficit hyperactivity disorder, is poor motor skills in preschool (ADHD). Although motor problems may occur for no apparent reason, they are often associated with ADHD. Children with autism typically have difficulties with motor control, and most individuals with ADHD also suffer from a serious mental condition. Kopp found that adolescent girls who had Attention Deficit Hyperactivity Disorder Type A and a normal or almost normal IQ had more trouble than other teenage girls with motor coordination. The majority of females with ADHD who were preschool age reported having trouble with their hand-eye coordination (4/5). There were performance differences between the major diagnostic categories, and gross motor and sensory deficits were more severe in the ADHD group compared to the ADHD group. The findings also revealed a correlation between inadequate motor coordination and reduced levels of independence, which provides evidence for a link between difficulties in adaptive daily skills, motor deficits, and social, language, and attentional difficulties. (Kopp *et al.*, 2010).

Challenges with the initial diagnosis and following motor deficits may be potential causes to the relatively low rate of involvement in Physical Education (PE) among children with ADHD (38%). Children with attention deficit hyperactivity disorder (ADHD) have a much lower likelihood of participating in physical activity, according to the findings of Cairney *et al.* (2005). It has been suggested that children who suffer from neuropsychiatric conditions should participate in specialised physical education classes. These classes would help the children develop their motor abilities, boost their self-confidence, and improve their overall health. The United Nations' Sustainable Development Goals place a premium on early childhood development as a mechanism for children to realize their full potential. The United Nations' Sustainable Development Goals prioritize early childhood development as a means to reach full potential, with physical development being a key component. The Goals emphasize the importance of fine motor skills, including walking, running, jumping, balancing, standing on one foot, catching, throwing, and kicking (Isaksen *et al.*, 2017). Motor skills have been widely acknowledged as a crucial aspect in the development of sport-specific abilities. Evidence suggests that these abilities predict participation in physical exercise and are positively correlated with cognitive outcomes. The lack of motor skills has been connected to childhood obesity, which in turn has been linked to both immediate and long-term health problems. This highlights the importance of promoting the development of motor skills in children.

Table 1. Contribution of the Literature Review

<p>A cross-sectional study aimed to examine the mediating effect of Generalized Self-Efficacy (GSE) on the relationship between Developmental Coordination Disorder (DCD) and Physical Activity (PA) in a sample of 590 students in Ontario, Canada. Results indicated that GSE significantly mediated the relationship between DCD and PA, accounting for 28% of the variance in PA. These findings suggest that GSE may play a crucial role in promoting PA among children with DCD and support the implementation of interventions aimed at increasing PA in this population</p>
<p>Cairney J, Hay JA, Faught BE, Wade TJ, Corna L, Flouris A. (2005). <a href="#">Developmental coordination disorder, generalized self-efficacy toward physical activity, and participation in organized and free play activities</a>. <i>The Journal of Pediatrics</i>. ;147(4):515-20.</p>
<p>A study of twenty 3-6 year old autistic children found that those in a massage therapy group showed less stereotypical behavior and improved on-task and social behavior during school observations, as well as fewer sleep problems at home. The therapy involved 15-minute bedtime massages by parents, who were trained by a massage therapist, while the control group's parents read stories to their children.</p>
<p>Escalona, A., Field, T., Singer-Strunck, R., Cullen, C., &amp; Hartshorn, K. (2001). Brief Report: Improvements in the Behavior of Children with Autism Following Massage Therapy. <i>Journal of Autism and Developmental Disorders</i>, 31(5), 513–516. <a href="https://doi.org/10.1023/a:1012273110194">https://doi.org/10.1023/a:1012273110194</a>.</p>
<p>This paper explores the impact of various external factors on the estimation of Autism Spectrum Disorder (ASD) prevalence. A literature review was performed using PubMed searches and manual searches of related articles, resulting in the inclusion of 49 studies. The results showed significant variations in the reported prevalence rates of ASD and the methodology used in the studies. The authors conclude that the methods used in some studies may contribute to the recent increase in reported prevalence rates.</p>
<p>Isaksen J, Diseth TH, Schjølberg S, Skjeldal (2017).OH. <i>European Journal of Paediatric Neurology</i>;17(4):327-33.</p>
<p>This study provides information on recognizing and assessing autism spectrum disorders in children. It covers the definition, history, diagnostic criteria, early signs, and potential causes of autism. It also helps pediatricians by analyzing a method to identify children with autism early on. The research is accompanied by a second clinical report on managing children with autism, as well as a toolkit to assist pediatricians in the identification, evaluation, and management of autism in children.</p>
<p>Johnson Chris Plauché, &amp; Myers, S. M. (2007). Identification and evaluation of children with autism spectrum disorders. <i>Paediatrics</i>, 120(5), 1183–1215. <a href="https://doi.org/10.1542/peds.2007-2361">https://doi.org/10.1542/peds.2007-2361</a>.</p>
<p>This study investigated developmental coordination disorder (DCD) and its impact on daily life skills in girls with autism spectrum disorder (ASD) and/or attention-deficit/hyperactivity disorder (ADHD). A sample of 131 girls was evaluated using standardized tests of motor function and parent interviews and questionnaires Results showed a high prevalence of DCD in both school-age and preschool girls with ASD, with young age, autistic symptoms, and low IQ being predictors. Motor coordination problems were found to negatively impact daily life skills even after controlling for IQ.</p>
<p>Kopp S, Beckung E, GillbergC.(2010). <a href="#">Developmental coordination disorder and other motor control problems in girls with autism spectrum disorder and/or attention-deficit/hyperactivity disorder</a>. <i>Research in developmental disabilities</i>. Mar 1;31(2):350-61.</p>
<p>The aim of this study is to investigate autism and assess early intervention. Autism is a neurodevelopmental condition characterized by social communication difficulties, repetitive behavior, and restricted interests. It affects 1% of the global population and is more common in males. The cause is a combination of genetics and environmental factors and is associated with atypical cognitive profiles. In conclusion, early detection and multidisciplinary assessment, including a supportive environment, are key for effective intervention through behavioral therapy and drugs to address the symptoms.</p>
<p>Lai, M.-C., Lombardo, M. V., &amp; Baron-Cohen, S. (2014). Autism. <i>The Lancet</i>, 383(9920), 896–910. <a href="https://doi.org/10.1016/s0140-6736(13)61539-1">https://doi.org/10.1016/s0140-6736(13)61539-1</a>.</p>
<p>This study aimed to evaluate the effectiveness of massage as a treatment for autism by conducting a literature search. Out of 132 articles only 2 met the inclusion criteria and were analyzed. Results showed limited evidence for the effectiveness of massage in treating symptoms of autism with high risk of bias in the included studies. Small sample sizes, predefined primary outcome measures, inadequate control for nonspecific effects, and a lack of power calculations were the study limitations. The authors suggest that more research is needed on the effectiveness of massage therapy in treating autism.</p>
<p>Lee, M. S., Kim, J.-I., &amp; Ernst, E. (2010). Massage therapy for children with autism spectrum disorders. <i>The Journal of Clinical Psychiatry</i>, 72(03), 406–411. <a href="https://doi.org/10.4088/jcp.09r05848whi">https://doi.org/10.4088/jcp.09r05848whi</a>.</p>
<p>According to authors there are few comparative studies in methods and treatments of stress. The findings of a meta-analysis of breathing therapies for anxiety symptoms, showed a large effect size for panic symptoms, a moderate effect size for general anxiety symptoms, and a small effect size for phobias and PTSD symptoms. Exposure therapies proved more effective than relaxation or cognitive therapies for phobic disorders, while cognitive-behavioral therapy has a small and inconsistent effect than relaxation therapy.</p>
<p>Lehrer, P. M., Woolfolk, R. L., &amp; den, B. O. van. (2021). <i>Principles and practice of stress management</i>. The Guilford Press.</p>
<p>ADHD is a complex psychiatric disorder that has been the subject of numerous advances in understanding its etiology over the past two decades. Despite the growing literature on the disorder, important aspects such as subtype instability, heterogeneity, and neural correlates remain unclear. A better understanding of the heritability of ADHD will be crucial in characterizing the disorder. Further research on the heterogeneity and neurobiology of typically developing children will aid in investigating the multiple pathways and circuits related to ADHD.</p>
<p>Matthews, M., Nigg, J. T., &amp; Fair, D. A. (2014). Attention Deficit Hyperactivity Disorder. <i>Curr Topics BehavNeurosci</i>, 16, 235–266. <a href="https://doi.org/10.1007/7854_2013_249">https://doi.org/10.1007/7854_2013_249</a>.</p>
<p>This study provides an overview of Attention Deficit Hyperactivity Disorder (ADHD). The causes of ADHD are highly heritable and multifactorial, including genetic and non-inherited factors, but the exact causes are still unknown. Recommended treatments for ADHD include non-drug interventions and pharmacological treatment for those most severely affected. Although, stimulant medication has shown to provide short-term benefits in randomized controlled trials, the efficacy of non-drug treatments is still unproven.</p>
<p>Thapar, A., &amp; Cooper, M. (2016). Attention deficit hyperactivity disorder. <i>The Lancet</i>, 387(10024), 1240–1250. <a href="https://doi.org/10.1016/s0140-6736(15)00238-x">https://doi.org/10.1016/s0140-6736(15)00238-x</a>.</p>
<p>The International Classification of Functioning, Disability and Health for Children and Youth (ICF-CY) was created by the World Health Organization in 2001 since the manifestation of health conditions and disabilities in this children differs from adults, requiring consideration of these differences in the classification. It is derived as a framework from the International Classification of Functioning, Disability and Health (ICF) and it is used to document the growth of children and the impact of their surroundings.</p>
<p>World Health Organization (2007). <i>International Classification of Functioning, Disability, and Health: Children &amp; Youth Version: ICF-CY</i>. World Health Organization.</p>

Furthermore, in cases where an individual has a developmental or medical issue, a deficit in motor skills may persist, making specialized therapy a crucial aspect of intervention. This can result in limitations in the individual's ability to engage in certain physical activities (Lehr et al., 2021).

Consequently, it is recommended that early intervention programmes for children with ADHD focus on the child's motor development. Children who lack specific motor skills may benefit from the assistance of physical therapists, who can promote the growth of more effective motor abilities.

## RESULTS

This scientific article investigates the impact of physiotherapeutic intervention on the mental health of children who have neurodevelopmental disorders, specifically attention deficit hyperactivity disorder (ADHD) and autism spectrum disorders. The study focuses on the role that this intervention plays in the management of stress, enhancing mood, and improving the psychosocial and emotional well-being of these children. The present research aimed to assess the efficacy of physiotherapeutic intervention in enhancing the mental health of children diagnosed with neurodevelopmental disorders, such as autism spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD). During the formative years of children with these disorders, they often face motor challenges that require physiotherapy and educational programs. Without proper treatment, poor muscle control can lead to severe consequences. The treatment of physiotherapy found to be effective in reducing the severity of motor challenges and enhancing muscle control, resulting in alleviating muscle weakness in these children (Kopp *et al.*, 2010). The use of game-based therapy and fitness interventions by physiotherapists has the potential to positively impact body image and improve the long-term outlook for a significant number of children diagnosed with Autism Spectrum Disorder or Attention Deficit Hyperactivity Disorder. (Lee *et al.*, 2010).

## DISCUSSION

Physical activity has been recognized as a protective factor for children's mental health, contributing to overall resilience and well-being. Research has been conducted to understand the protective factors associated with mental health, with the goal of improving lifestyle choices and promoting lifelong mental health (Johnson *et al.*, 2007). Studies have shown that physical activity enhances children's mental health, including the well-being of children with autism and other neurodevelopmental disorders. Exercise has also been shown to reduce depression. Despite the well-established positive effects of physical activity with typical development, the benefits of physiotherapy on children with autism and other neurodevelopmental disorders have received limited attention in the literature (Johnson *et al.*, 2007). Physical therapy can improve self-esteem and overall well-being in children with neurodevelopmental disorders. Appropriate physical therapy has also been shown to enhance cognitive skills, such as attention, in these children. The psychological and cognitive benefits of physical therapy can help boost resilience and protect children from life's challenges (Johnson *et al.*, 2007). Mental health encompasses emotional, psychological, and social well-being, and impacts mood, energy, and thought processes throughout their lifespan. Mental illness can alter a person's ideas, feelings, and behaviour over time. It is important to note that the WHO (2007) defines mental health as "the condition of well-being in which each person successfully copes with life's challenges, can work productively, and can actively participate in his social environment, as opposed to merely the absence of problem or "disorder". The concept of mental health is elusive and remains a goal that society strives towards, as it is currently unquantifiable. Therefore, the concept of mental health requires further investigation to be incorporated into mental health systems, services, and institutions. Any country or organization that seeks to offer these services must conduct unique study that considers: 1. the diverse theoretical ideas and scientific facts; 2. the cultural aspects of each group (WHO, 2007).

Mental health is a fundamental component of an individual's holistic health and well-being, with profound effects on their daily functioning and personal growth. Scholarly research has acknowledged it as a basic human right, emphasizing its significance in achieving optimal health outcomes (Johnson *et al.*, 2007). Mental health concerns encompass a broad range of conditions, including mental disorders, psychosocial disabilities, and conditions that cause substantial suffering, functional impairment, or self-harm. Although poor mental health is often associated with decreased well-being, this is not always the case. In light of this, it is important to approach the implementation of mental health systems, services, and institutions from other nations with caution, as simply adopting these may not lead to successful outcomes. Laws and regulations that support and protect children's mental health, programs that aid caregivers, and initiatives that improve the quality of life for disabled children, have been shown to enhance the mental well-being of children (Johnson *et al.*, 2007). The mental health of children is influenced by numerous factors, including growth and development, gender, and underlying conditions. Poor mental health during childhood can have a significant impact on psychological and emotional development, social skills, and behavior. Implementing well-designed mental health promotion and prevention programs can help improve children's well-being and slow the progression of mental health issues.

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