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THE EFFECTIVENESS OF AN EDUCATIONAL PROGRAM OFFERED IN SWIMMING AND ITS EFFECT ON IMPROVING THE ATTENTION DEFICIT HYPERACTIVITY DISORDER IN AUTISTIC CHILDREN

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Abstract

The study aims to know the effect of an educational program in the ABCs of swimming on the improvement of the indicator of attention deficit hyperactivity disorder in autistic children, and to answer this problem, we used a case study approach 10 children aged 4–10 years old who had been diagnosed with both autism spectrum disorder and ADHD by outside psychologists, and the duration of the swimming educational program lasted ten weeks with two lessons per week. As a study tool, we relied on the Attention Deficit Hyperactivity Disorder Scale (Essalem, 2020) with an emphasis on the attention part, and after analyzing the data, we concluded that the autistic child improved most of the indicators under study and this is confirmed by other studies in the same specialty, and that is why he recommends Researchers should swim regularly for autistic children.

Keywords: Autism, swimming, attention deficit, hyperactivity disorder.

Introduction:

Periodic and annual statistics from the World Health Organization have shown that one in 160 children has autism spectrum disorders (world Health Organization, 2019) Autism spectrum disorders (ASD) are situations in which people have difficulty developing normal social relationships or using language. Of course, or they absolutely cannot use it and behave in a compulsive and ritualistic manner. And this usually appears in childhood and continues into adolescence and adulthood, and it is the most difficult developmental impairment for the child in terms of the effect on his behavior. (Ghazal, 2007)

Autism and attention-deficit/hyperactivity disorder (ADHD) are neurodevelopmental disorders whose pathophysiology is mostly unknown. As far as the symptoms are different and, in some aspects, opposed, we hypothesize that there must be biochemical differences in the brain of the afflicted children. The aim of the study is to analyze comparatively the

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metabolite concentration of the cerebral white matter in autism, in ADHD, and in a control group of healthy children to test the hypothesis that *N*-acetyl aspartate (NAA) is decreased in autism and increased in ADHD. (Nicolas Fayed, 2005)

Autism, or autism spectrum disorder (ASD), refers to a broad range of conditions characterized by challenges with social skills, repetitive behaviors, speech, and nonverbal communication. According to the Centers for Disease Control, autism affects an estimated 1 in 54 children in the United States today.

We know that there is not one autism but many subtypes, most influenced by a combination of genetic and environmental factors. Because autism is a spectrum disorder, each person with autism has a distinct set of strengths and challenges. The ways in which people with autism learn to think and problem-solve can range from highly skilled to severely challenged. Some people with ASD may require significant support in their daily lives, while others may need less support and, sometimes, live entirely independently.

Several factors may influence the development of autism, and it is often accompanied by sensory sensitivities and medical issues such as gastrointestinal (GI) disorders, seizures, or sleep disorders, and mental health challenges such as anxiety, depression, and attention issues. Signs of autism usually appear by age 2 or 3. Some associated development delays can appear even earlier, and often, it can be diagnosed as early as 18 months. Research shows that early intervention leads to positive outcomes later in life for people with autism. (speaks, 2017)

In 2013, the American Psychiatric Association merged four distinct autism diagnoses into one umbrella diagnosis of autism spectrum disorder (ASD). They included autistic disorder, childhood disintegrative disorder, pervasive developmental disorder-not otherwise specified (PDD-NOS), and Asperger syndrome.

Autism is defined as an intellectual disability that affects an individual's behavior, his communication with others, and his interaction with them, which makes him oblivious to what is going on around him, weakens his response to images and sounds around him, and he cannot get along with others and form relationships, which makes him different from the healthy people around him. Of the same age. (Fombonne, E. 2019) This has earned him the interest of many researchers from various fields who, through many studies, have wanted to contribute to finding solutions to social, behavioral, educational, physical, and economic consequences that may result from autism, both for the patient and for himself. Or its surroundings, by removing or mitigating them.

One of the most important issues that have become troublesome for many parents and educators of children with autism is a lack of attention and concentration. Fahd Abdo Bashiri (Consultant Pediatric Neurologist) reported that most children with autism spectrum disorder have been diagnosed in their lives with hyperactivity disorder Attention Deficit Hyperactivity Disorder (ADHD)), and when they looked at children with autism spectrum disorder aged 10 and older, the percentage of those children who had ever been diagnosed increased to 52%, some researchers believe these two disorders are distinct when one of them is diagnosed, the other is automatically excluded. In addition, some ADHD diagnostic criteria show that symptoms do not appear in ASDs, including Asperger's disorder and autism. (Bashiri, 2018)

However, several studies have proven the opposite. In the study (Benjamin E. Yerys, 2009), recent behavioral classification of executive function (BRIEF) estimates in the United States of America show that 31% of children with autism spectrum disorder (ASD) respond to diagnostic criteria for deficit disorder. Attention deficit hyperactivity disorder (ADHD) and 24% of children with autism spectrum disorder have clinical symptoms of ADHD below the threshold, and Blythe A. Corbett (2009) finds that the indicators of perceived deficits in the attribute of vigilance and control confirm many autistic children exhibit cognitive characteristics compatible with attention deficit hyperactivity disorder, while a study (Darryn

M. Sikora, 2012) classifies them as children with autism spectrum disorders and ADHD symptoms in a special category. Different from (ADHD) and (ASD).

The results of their study concluded that there was a greater impairment in adaptive functioning and health-related quality of life of children with autism spectrum disorders and ADHD symptoms compared to children with ADHD.

Interest in the extent of compatibility between Attention Deficit Hyperactivity Disorder (ADHD) and Autism Spectrum Disorder (ASD) has increased in recent times as clinical research has become supportive of congruence and the frequency of certain features of ADHD (eg, hyperactivity) in people. People with Autism Spectrum (ASD) also have (social communication deficit). In contrast, relatively little research has been devoted to therapeutic considerations, and the vast majority of intervention research has examined pharmacotherapy using conventional ADHD medications. (Kollins, 2012)

(Staff, 2019) finds that children with ADHD often benefit from behavior therapy, social skills training, parenting skills training, and counseling, a psychologist can provide which, or worker. The social worker or another mental health professional, but this does not rule out the existence of other alternative therapies such as alternative medicine skills, as some research findings have shown that alternative medicine treatments may reduce symptoms of ADHD, but before considering any alternative interventions, talk to your doctor to determine whether the treatment is safe.

And some alternative medicine treatments are tried, but not yet scientifically proven, and include regular yoga or meditation and relaxation which can help children learn discipline, and most diets promoted as suitable for ADHD, which include Eliminate foods that can increase hyperactivity, like sugar and common allergens, like wheat, milk, and eggs (Staff, 2019).

While experts from the World Health Organization (WHO) believe, according to the final report of the Executive Board, during the 142nd session, that much recent research and studies have proven that physical and sports practice has a role to play in alleviating and showing the difficulties and problems that people may encounter. Whether physical, psychological, social, or economic. The report underlined the great importance of moderate and regular physical activity for health, as it states that “ sport is an activity that does not engage in adequate exercise, although it contributes significantly to physical activity for all people of all. Reconstruction produces significant social, cultural, and economic benefits for societies and nations " (WHO, 2017-12-22).

Consultant psychiatrist and speech therapy "Fatima Muhammad" believes that it is possible to treat autistic patients by implementing a program of movement games adapted to each case according to their intelligence, skills, experiences, and abilities, Mental. This game includes specific movements with which the autistic patient practices and which help him concentrate and allow him to communicate and integrate with the surrounding society (Salah, 2018), and (Vygotsky) believe that the game helps to experience roles, develop social interaction and develop cognitive, linguistic and emotional skills. (Famous, 2016), The German Association of Pediatricians and Adolescents confirms in a report that sport is an ideal solution for children suffering from hyperactivity and attention deficit, in combination with pharmacotherapy and psychological care. The association explained that sport helps to raise the level of attention and concentration in children, as it stimulates what is called the executive functions of the brain Sports that train movement, which include attention and concentration, are ideal for children with attention deficit, such as ball and rock climbing. (Arabs, 2018).

This is also confirmed by a study (Yu-Kai Chang, 2012) that was conducted to determine the effect of high-intensity aerobic exercise on executive function in children with hyperactivity deficit disorder. Attention (ADHD). High-intensity exercise has been shown to

aid performance in the Stroop test, especially with Stroop Color-Word. Children in the exercise group showed improvement in WCST-specific performance in discontinuous errors and completed categories, while they found no effect in these displays in the control group. The researchers explained that exercise stimulates attention resources, affects the dorsolateral prefrontal cortex, and takes part in the release of dopamine caused by exercise.

Aqua-therapy is one of the world's means of caring for children with autism, as it uses water as a resistance method to strengthen able-bodied muscles or as an aid to move weak muscles. She also adds that swimming helps the child develop cognitive, cognitive, and motor skills and increases the fitness of various body systems, especially the heart and blood vessels. She also confirmed that the child feels more secure inside the pool, which encourages them to be independent while moving in and out of the water.

Swimming also helps children with autism regulate breathing, improve voice and speech, and swimming and water games push children towards social participation and make them understand that they can affect their environment through movement because he sees the results of their movements directly on the water and feels a sensation of discomfort. (Dart, 2015) Its aim was to determine the potential benefits that physical activity, particularly water programs, can provide in reducing behavioral problems common in some people with disabilities or disorders. As autism spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD), a review of the literature was conducted to examine the effects that water programs and physical activity may have on these behaviors, such as problems with social interaction, self-pacing behaviors, attention, and communication.

The results showed the obvious benefits of this program, particularly the Aquatic Program for Children with Autism Spectrum Disorders and ADHD, to help reduce behavior problems and improve social behaviors. The nature and design of the programs have been a key factor in increasing children's success.

In view of this, does learning the ABCs of swimming improve attention and focus in children with autism? Through this question, we aim to determine whether the educational program proposed to teach breathing, buoyancy, diving, gliding, and movement in water affects the improvement of attention and concentration in children with autism, and considering the theoretical approach and studies mentioned above, we assume that teaching children with autism to swim positively affects; it improves attention and concentration.

Research method:

The research sample comprised 10 healthy autistic children aged 5 to 10, after acceptance by their parents to participate in the research, the proposed teaching units having been applied to teach the ABCs of swimming. (breathing, diving, buoyancy, mobility) in the swimming pool of the Institute of Physical Education and Sport in Algeria, Two sessions per week for ten weeks, we relied on the collection of qualitative data related to the basic skills of swimming on the scorecard derived from the list of attention-deficit manifestations (Team, 2020) and (Cherney, 2019).

Study tools:

- The Conners scale to assess the behavior of the child " Teacher appreciation " (Al-Beheiri, 2011)

Definition of the scale, method of application, and correction:

- The teacher uses this scale to estimate the behavior of the child to diagnose attention deficit disorder (associated and not associated with hyperactivity) and to measure the main patterns of behavior problems that the child appears, this version with the 28 items contains four subscales (behavior problems, hyperactivity, negativity, and lack of attention, hyperactivity of the ten items.) We give the estimates of the 28 items through four answers (Never = 0, As much as a amount = 1, As far as large = 2, As far as great too= 3).

- A high score on the scale shows that there is a problem, while a low score shows that there is no problem.
- It applies to children from 3 to 18 years old.

Table 1. Shows the sub-measures, their abbreviations, and the sentences found under each one

The name of the scale	abbreviation	Items
Conduct problem	A	4,5 ,6 ,10 ,11 ,12 ,23 ,27
Hyperactivity	B	1 ,2 ,3 ,8 ,14 ,15 ,16
Inattentive –passive	C	7 ,9 ,18 ,20 ,21 ,22 ,26 ,28.
Item hyperactivity index	D	1 ,5 ,7 ,8 ,10 ,11 ,14 ,15 ,21 ,26

Sub Scale (C):

Table 2. Represents the Sub Scale (C).

N°	Inattentive –passive	Never	As much as a amount	As far as large	As far as great too
1	He is very sensitive when criticized	0	1	2	3
2	Daydreaming	0	1	2	3
3	Easy to drive by other kids.	0	1	2	3
4	Lacks driving ability.	0	1	2	3
5	He fails to finish the things he started.	0	1	2	3
6	Childish and immature.	0	1	2	3
7	Easily frustrated during an effort.	0	1	2	3
8	He has difficulty learning.	0	1	2	3
Total					

Educational programs:

It comprises several stages, the first of which took place in 20 sessions lasting 10 weeks, with two lessons per week lasting one hour.

The results:

Table 3. Represents the results of the pre and post measurements of the level of attention deficit and concentration in the study sample according to the Conners scale to assess the behavior of the child.

N°	Inattentive –passive	The pretest	Post test	T-Student	T-Student tabular	The level
1	He is very sensitive when criticized	2	1	1.89	6.17	Sign
2	Daydreaming	3	1			
3	Easy to drive by other kids.	2	1			
4	Lacks driving ability.	3	2			
5	He fails to finish the things he started.	3	0			
6	Childish and immature.	2	1			
7	Easily frustrated during an effort.	3	1			
8	He has difficulty learning.	3	1			
Total		21	8			
The arithmetic mean		2,625	1			

We can see from the results of table 3 that there is an almost constant improvement for all the indicators, the total of the pre-measurement points reaching 8 points. And this shows, according to the scale, a high percentage of distraction, compared to the overall score obtainable, which is equal to 24 points. Unlike the results of the post-test, which reached 21 points, an improvement of 13 points in the overall score and a score of 03 as the best progression in the appearance of failure to complete the tasks he begins, knowing that we only used section (C) of the global scale, which measures inattention (distraction).

It is also noted in the table that the T-Student value for the significance of the differences between the two tests was 6.17, which is greater than T-Tabular, which was 1.89 to the degree of freedom (7) and at the level of significance (0.05), which proves the existence of statistically significant differences in the results in favor of post-measurement. This shows a noticeable improvement in indicators of poor attention after the program implemented by the researchers.

Table 4. Represents the results of the pre and post measurements of the level of attention deficit and concentration in the study sample according to the conners scale to assess the behavior of the child, “parental estimate“

N°	Inattentive –passive	The pretest	Post test	T-Student	T-Student tabular	The level
1	He is very sensitive when criticized	3	2	1.89	5.61	Sign
2	Daydreaming	3	2			
3	Easy to drive by other kids.	2	1			
4	Lacks driving ability.	3	2			
5	He fails to finish the things he started.	3	1			
6	Childish and immature.	3	2			
7	Easily frustrated during an effort.	3	1			
8	He has difficulty learning.	3	0			
Total		23	11			
The arithmetic mean		2,875	1,375			

We can see from the results of table 4 that there is an almost constant improvement for all aspects (indicators) of the scale, the total of the pre-measurement points reaching 23 points. And this shows, according to the scale, a high percentage of distraction, compared to the overall score obtainable, which is equal to 24 points. Besides the results of the post-test, which reached 11 points, an improvement of 12 points in total and a score of 03 as the best progression in the appearance of failure to complete the tasks he begins.

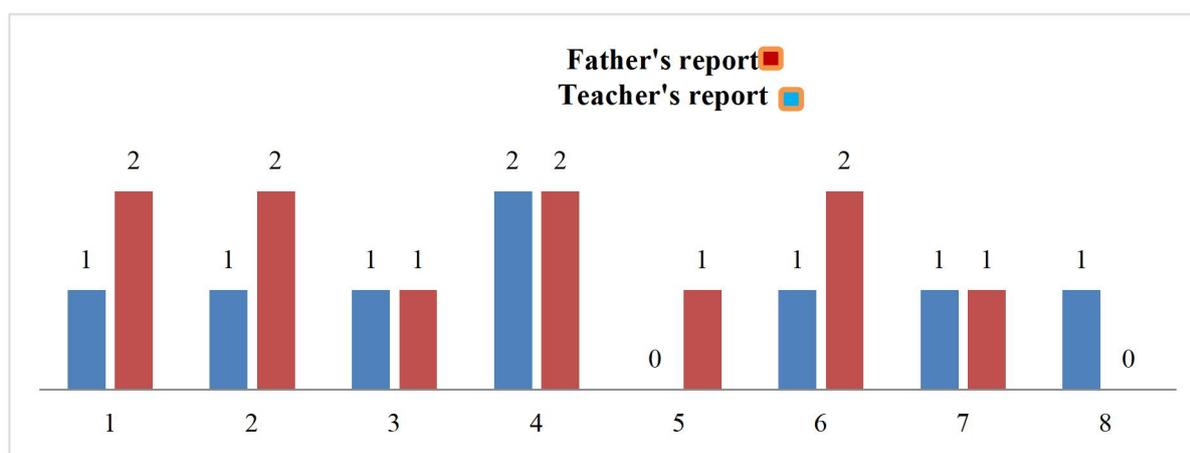
It is also noted in the table that the T-Student value for the significance of the differences between the two tests was 5.61, which is greater than T-Tabular, which was 1.89 to the degree of freedom (7) and at the level of significance (0.05), which proves the existence of statistically significant differences in the results in favor of post-measurement. This shows a significant improvement in the indicators of poor attention after the program implemented by the researchers.

Table 5. Represents a comparison of the results of dimensional measurements of the level of attention deficit and concentration in the study sample according to the Conners scale to estimate the behavior of the child to estimate the father and teacher.

N°	Inattentive –passive	parental appreciation	Teacher appreciation	T-Student	T-Student tabular	The level
1	He is very sensitive when criticized	2	1	1.89	1.42	غير دال احصائيا
2	Daydreaming	2	1			
3	Easy to drive by other kids.	1	1			
4	Lacks driving ability.	2	2			
5	He fails to finish the things he started.	1	0			
6	Childish and immature.	2	1			
7	Easily frustrated during an effort.	1	1			
8	He has difficulty learning.	0	1			
Total		11	8			
The arithmetic mean		1,375	1			

We can see through table 5 the extent of the convergence of the results of the post-measurement of the father's report and the teacher's report, which shows the convergence because the T-Student value was 1.42, which is less than the T-Tabular of 1.89 at a degree of Freedom 7 and the significance level of 0.05. And it also shows how satisfied the father is with the improvement in the child's condition.

Figure 1. Comparison between the father's report and the teacher's report in the results of the Conners scale (attention section)



We notice from the figure (1) that there is a correspondence between the father and the teacher in appearance (3) it is easy to lead him by other children, (4) he cannot drive, and (7) he easily gets frustrated with his exertion when it comes. The results of the other aspects are close and the difference does not exceed one mark.

-Discussion:

We note through the results of the validity of the hypothesis proposed by the researchers, namely that the swimming education program for beginners applied to the autistic child had a positive effect on the improvement of the indicators of attention deficit and concentration. We attributed this to the exercises and water games of which they compose the program. And the type of sport that was chosen, which is swimming. This is because of the

pleasure, calm, refreshment, and entertainment it provides, besides the atmosphere of fear and insecurity of the aquatic environment which stimulates them to trust, take risks, and overcome challenges. And be careful and focus on the instructions and advice that helps them overcome these challenges and feel a sense of confidence and security. And the physical benefits such as improving the body's blood circulation and the work of the heart and developing sensory performance by discovering and interacting with the new environment, improving movement performance, and learning them. First steps of swimming such as buoyancy and various movements in the water.

These results are very consistent with the results of a study (Weronika, 2018), which showed that swimming, while wonderful for physical health and well-being, has invaluable benefits for mental health. As children grow and develop, the positive mental effects of swimming coincide and even outweigh the physical benefits of swimming. While a study (Darcy S, Lisa K & Janet M, 2009) titled " Physician Perceptions of the Benefits of Water Therapy for Children with Autism, " most religious physicians surveyed confirmed an increase significant swimming skills, attention, muscle strength, balance, and endurance/support. Eye contact and water safety, from the perspective of physicians treating children with autism. We also find in the study (Hall, 2013), where this study used several methods to gain an in-depth perspective in implementing strategies and techniques of learning to swim programs for six children with autism, where interviews Personal data were conducted with two coaches and parents of six children, besides observation and monitoring data. Collected from the researcher. Through thematic analysis of the data, the perceived gains and benefits of using an extended course duration, the use of wetsuits, and the use of a mat/floating platform for education. They included some of the most common benefits found that swimmer education programs helped increase comfort, relaxation, balance, and increased tambourine among the study sample, as reported. a study conducted by (Jennifer and Maridith A, 2014), entitled " Benefits of a Structured Swimming Program for Children Diagnosed with Autism Spectrum Disorder, " they have viewed aquatic treatment as beneficial for many years in the healing of people with musculoskeletal or neuromuscular disorders. , and doctors are now extending the use of hydrotherapy to a group. New children with autism for recovery and as early intervention. Where, during this experimental study, a single sampling design comprising three individuals was used using the Water Behavior Monitoring Scale (ABOS) to assess and measure changes in the behavior of each of the three sample members while participating in the on-water programs. (orientation to the present - social communication skills - emotional control, F - responses to stimuli).

Response levels in each subgroup varied from participant to participant and from observation to observation, and the data collected from this study show that people diagnosed with autism may have shown slight improvements when applying the intervention. (Benjamin, & Georgia, 2017), which should study parents' perceptions of engaging in physical activity (AP) of their adult children with autism spectrum disorders. The theoretical framework used in this study was social ecology, and the participants were nine fathers from families with an adult child with autism spectrum disorder ranging in age from 18 to 42 years. Using interviews through which the parents' life experience about the motor skill of their children was explored, the participants were Establishing four axes: support and advocacy for the practice of physical activity, engaging in a physical activity independently, benefits of physical activity, and barriers or reasons for withdrawal from certain activities. Parents' comments during the interviews showed that personal and societal factors were essential to keep people with autism spectrum disorders engaged in physical activities.

- Conclusion:

Regular physical activity, especially swimming, has a positive effect on improving the manifestations of attention deficit and concentration deficit in children with autism. By

discussing the results, we show the effectiveness of regular physical activity as an early treatment and preventive method to improve the physical, psychological and social condition of children with autism. This study also showed the extent to which parents include their autistic children in regular physical activity programs, especially swimming, because of the benefits this has on their health and the need for doctors and psychologists. In encouraging the use of physical and sports activities as a method of treatment of autistic children in particular. Activities in aqueous media.

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