BioChemMed

Technium BioChemMed Vol. 3, Issue 2 pp.87-106 (2022)
ISSN: 2734-7990
www.techniumscience.com

Nutritious Diet, Physical Activity and Mobiles. The Game Changers of ADHD

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Abstract. Proper nutrition and physical activity over time are alternative interventions for children with ADHD and are recognized in many European countries. Can be applied as an educational and therapeutic practice both in a school environment and in a therapeutic context adjunct to other forms of therapy. THE planning of these interventions aims, on the one hand, to promote its health by reducing the symptoms of ADHD (hyperactivity, behavioral problems) and on the other hand in the development of social and emotional skills such as socializing, playing, and h self-esteem. The purpose of this paper is to record research data on the implementation of diet and exercise programs in the world through a review of the literature. Specifically, many foods have been studied to help children with ADHD, some others are classified as toxic agents and various approaches to physical activity. The results showed that they do exist dietary interventions and physical activity programs that are applied in many countries with positive results in all aspects of the behavior of children with ADHD. The most common foods that help are those high in omega-3 and zinc and those that pose a risk are those that contain sugar and artificial substances. On the other hand, it was checked that they offer positively to children with ADHD approaches such as aerobic exercise and psychomotor activities. Regarding the participants in the interventions, the samples were students with neurodevelopmental disorders studied. The frequency of its application consumption of the labeled foods must be consumed consistently and daily after examinations such as o control ferritin. An aerobic program with a frequency of twice a week and psychomotor intervention once or twice a week is very helpful. In addition, gadgets are listed in this review for the proper organization and regulation of children to cover the difficulties they have, which is very important.

Keywords. diet, physical activity, ADHD, symptoms, behavior, self-esteem, ICTs, gadgets

Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is a mental health condition that Can cause unusual levels of hyperactivity and impulsive behaviors. People with ADHD may also have trouble focusing on a single task or sitting for a long time. Many people experience carelessness and changes in energy levels. [3] The appearance of ADHD symptoms in children is 7.5 percent worldwide while in adults it reaches 2.5 percent and the Its cause is due to both genetic and environmental factors. [10] Nutrition and physical activity play a role important

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and ancillary role in reducing its symptoms and promoting health and good quality of life. According to the World Health Organization Nutrition and physical activity are essential elements in the prevention of neurodevelopmental disorders and other diseases such as obesity and should be considered in any intervention performed in children with ADHD. [50] The diet and physical activity can contribute to the healing effects in children but are often overlooked treatments are implemented and there is no holistic approach. In the following sections, we review the current studies that analyze the role-specific components of the diet in developed countries and how interfere with the central nervous system facing many symptoms of ADHD. In addition, a positive effect of programs was identified as physical activity resulting in a change in behavior in many areas such as cognitive and socio-emotional. In addition, The results of these intervention programs could form the basis for the development of targeted prevention programs for students to reduce modifiable risk factors.

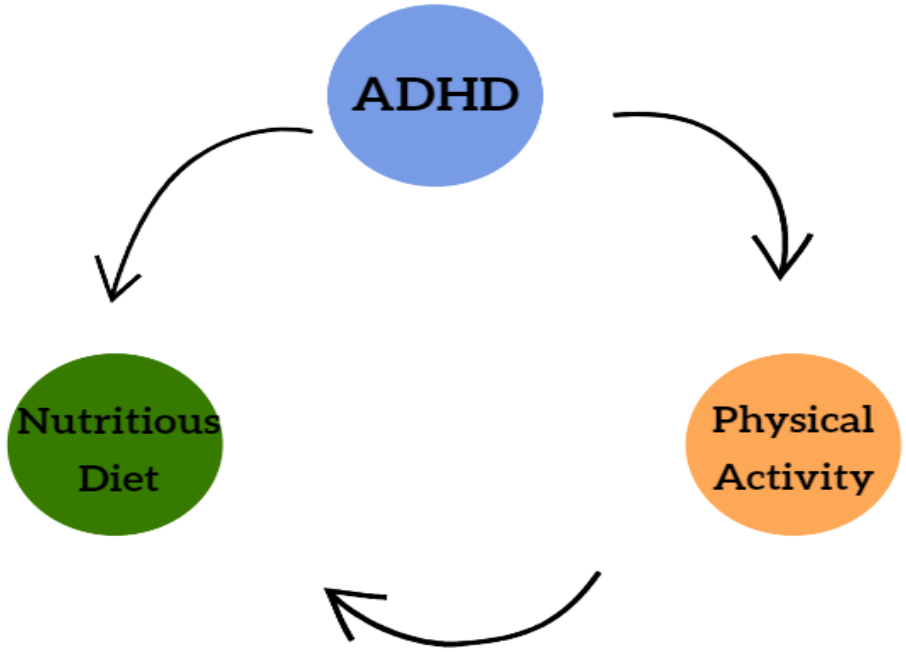

Figure (1): Schema about the connection of ADHD with Nutritious Diet and Physical Activity

1. The role of nutrition in ADHD

Nowadays, efforts are being made to address and intervene in neurodevelopmental disorders through therapies that include combining a behavioral approach and medication. [11] Many times, however, the results are not visible which as well the reason many families look for new paths through diet either in combination with the above approaches or as an autonomous treatment for reducing their difficulties. In this way and through the present This article provides useful information for individuals, parents, and professionals' health to be properly managed for each individual. More specifically, the contribution of nutrition to its regulation will be

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studied the expression of these genes that reduce toxicity and oxidative stress and regulate risk factors promoting optimal health in addition what are these foods that affect and which are not the normal functioning of the brain in children with ADHD. So two groups were formed to demonstrate this study

a) Foods full of nutrients

b) Foods that end up becoming toxic to the brains of children.

2. Healthy foods for ADHD

Omega-3

According to [8] in the modern diet there is an imbalance between omega-3, which we receive, and omega-6 resulting in abnormal brain and body function with the latter excelling in a ratio of the first. Most omega-6 elements come from fiber such as nuts and vegetables and most foods contain Omega-3s are also derived from fiber such as linseed oil and nuts such as nuts. Children with ADHD have lower omega-3 levels in the bioethanol than children without ADHD and for this reason, its intake, of wilt is larger. They are called <essential fats> because our body can not synthesize them and must take them from the foods that consume. They are necessary for the normal functioning of the brain and can improve her behavior in many ways by improving her duration of attention with simultaneous reduction of hyperactivity and control of inhibition. [7] Foods such as fatty fish (salmon, tuna) and chia seeds help in this direction most important representative of omega-3 fats and its derivative is DHA essential component of all cell membranes and is found in abundance in the n brain and retina. According to [12] stressed that Children's neurodevelopment varies depending on maternal intake e DHA resulting in higher levels of maternal DHA at birth were associated with lower ADHD symptoms, such as inattention to infants. In a more in-depth analysis, is it was observed that breast milk has some association with symptoms of other f neurodevelopmental disorders there is discussed as it contains long-chain fatty acids such as DHA It is understood that those children who are fed artificial milk have more chances of developing ADHD symptoms compared to those who are fed with breast milk. [13]

It is important to emphasize that both periods (prenatal and, postnatal) are important for omega-3 (DHA) uptake. In the first because their concentration in tissues, plasm, and brain depends on the mother's diet mainly on fat consumption fish and is especially important in the third trimester of pregnancy up to the first six months of life. The result of insufficient omega-3 concentration results in low cognitive and linguistic skills, motor development deficits, and behavioral problems [12] During the postpartum period breastfeeding is a natural and effective source of DHA but it is directly related to the above that is, the mother's diet for her genetic makeup. In addition to premature infants, the amount of DHA that should be given to them should be greater than in the full months because they appear to have a higher risk of ADHD. The Food and Drug Administration (FDA) recommends pregnant women and breastfeeding women eat 2-3 servings of fish with lower mercury content per week. The best Fish options are salmon, s, sardines, and mackerel 2-3 times a day week to be the ideal amount. [14]

Zinc-Iron-Magnesium

Zinc is a very important element and that is why it participates in the production of dopamine, serotonin, and melatonin. His role dopaminergic system in ADHD is of paramount importance because impaired cerebral dopaminergic neurotransmission in the brain is involved in the symptoms of impulsivity and inattention. [51]

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In addition, there are deficits in reward and behavior motivation. According to [15] zinc has been associated with symptoms of ADHD, and more specifically children with all three ADHD types (careless, hyperactive, combined) have lower zinc and ferritin levels in diagnostics. In America, one of the most important nutritional deficiencies is specific metal reported and observed in families from lower socioeconomic status, in low birth weight infants birth and the elderly [16] In another survey, It is alleged that the population in Australia is concerned about t daily intake of zinc. Individual requirements vary because they about to the biological need to replace losses and zinc availability function from the foods consumed. During pregnancy the amount of zinc is calculated at 100 mg, to be provided by the expectant mother and Additional zinc requirement occurs mainly in the last quarter. [17] According to the Panhellenic Association of People with disordered, Attention Deficit Hyperactivity Disorder is safe to give 25 milligrams of zinc daily to children with ADHD without first being done blood test. Foods that are rich in this metal are oysters and other shellfish and provide the daily amount that The second most important food is beef but because it belongs to the category of red meat should be consumed with measure according to the World Health Organization. Half the amount of zinc provides us with chicken, legumes, and yogurt with it the latter have higher bioavailability.

Iron is also essential for the production of dopamine and plays an important factor in controlling symptoms of ADHD more specifically according to a survey in the US low ferritin levels (is a protein found within cells and its role is to store iron so that the body to be able to utilize it in the long run) serum were associated with ADHD as measured by the Conners rating scale for parents. The same study also showed larger cognitive deficits. [18] The deficits reported were not the only ones as well a recent study of children with ADHD in the city of Iowa Ferritin was associated with initial inattention, hyperactivity, and impulsivity as its levels were very low in the measurements. [19] At this point, it should be emphasized that in the above surveys children were not anemic and the fact that children have normal values in the general blood does not mean that ferritin levels there are normal. Because too much iron is dangerous, it is not recommended to administer iron without first checking the ferritin level. So, if iron levels are low, for example, the Consumption of iron-rich foods should be increased. Between them include lean red meat, turkey, chicken, shellfish, beans, and lentils.

Magnesium is also used to create neurotransmitters that are involved in executive functions such as attention aa and has a sedative effect on the brain. In US diets the magnesium consumed according to [20] has declined due to the popular western diet, increased use of fertilizers, and their increase in processed foods such as vegetables their magnesium content has been reduced by 25–80% compared to before 1950. It is understood that the average American diet provides just over half the recommended daily allowance for magnesium [8] In a study, 40 children with ADHD participated in a study on magnesium and vitamin B6. The children from the ADHD team presented significantly lower magnesium values than controls. Once inside at 8 weeks the magnesium increased and the vitamin decreased clinical symptoms of ADHD such as hyperactivity, mood swings and aggression, and also school attention improved [21]. We see an association between magnesium levels and the symptoms of ADHD that with proper nutrition (magnesium in this case) improves them. Magnesium is usually found in leafy greens cereals, nuts, and fish and can get me safety 100-300 mg magnesium twice a day after first and again control ferritin levels.

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Vitamin B

Vitamin B is a type of vitamin that is classified as water-soluble. Most of these vitamins play an important role in the treatment of children with ADHD and have completely different chemical structures, but most of them are from plant extracts. The vitamin includes thiamine (vitamin B1), riboflavin (vitamin B2), niacin (vitamin B3), pantothenic acid (B5), and pyridoxine (B6), biotin (B7) folic acid (B9) and cobalamin (B12). [22] More specifically, B6 controls concentration and calms the nervous system. The deficiency of this vitamin can affect metabolism and prevent the absorption of polyunsaturated fatty acids, its composition hemoglobin, as well as the neurotransmission process. [23] have recommended that vitamin B6 be taken into account when assessing children with ADHD and that it should be included as part of their treatment regimen. [24] Foods that are rich in B6 are chicken, turkey, tuna, salmon, lentils, sunflower seeds, cheese, brown rice, and carrots.

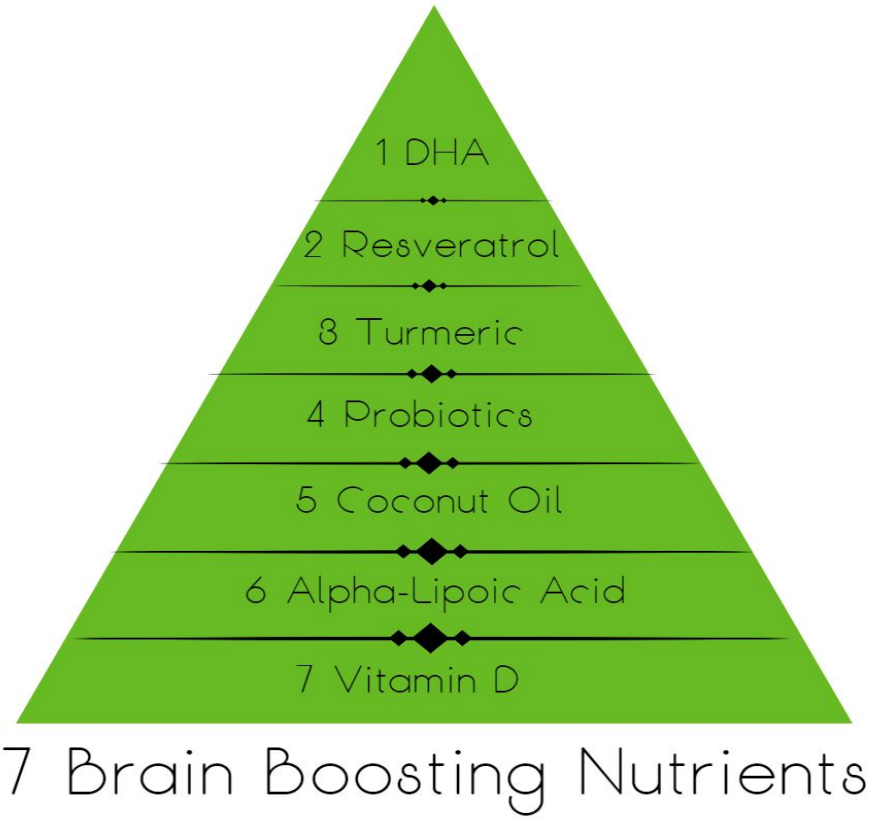

Figure (2): 7-layer pyramid with brain boosting nutrients

3. Toxic foods for ADHD

As ADHD over time can be characterized as one "environmental disturbance" the need to avoid it must be emphasized certain foods that increase its symptoms and create disorders of the brain networks.

Sugar

According to a survey conducted in New York [52] and more specifically in its school system the removal of sugar and preservatives from the school lunch program caused an

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increase of 15% in efficiency in cognitive tests. School performance in school New York City system moved below the national average above the national average. 800,000 participated in this study children and the results were impressive. Also in a study conducted at Yale University, we were shown that High-sugar diets increase inattention to some children and could benefit from mixed food such as meals that include protein, fat, and complex carbohydrates fiber to reduce postprandial reductions in levels of plasma glucose and increases in plasma epinephrine levels. [25]

According to [26] a positive correlation was observed between carbohydrate intake and hyperactivity index in children with ADHD according to the CPR scale. This is explained by food intake with a high glycemic index leading to high levels of blood sugar that affect behavior and aggression, as blood sugar rises, triggering it release of stress hormones such as epinephrine. What should be understood is that the consumption of simple processed carbohydrates like white bread is almost the same as consuming sugar. The body assimilates processed carbohydrates into glucose (sugar) so fast that its effect is almost the same as eating sugar from a spoon. In addition, sugary drinks or beverages should be avoided Fruit "cocktails" which have a higher sugar content than fresh juices.

Artificial foods and preservatives

The effects of artificial food additives on their behavior Children with ADHD have shown that a mixture of additives found usually in baby food increases the average level of hyperactivity in children aged 3 years and 8/9 years. and more specifically the greater the effect in children 3 years of age than in older children. The increased hyperactivity is associated with the development of educational difficulties, and therefore these adverse effects could affect the child's school ability [27]

One study [28] showed a link between ingesting a synthetic food coloring (tartrazine) and behavior change in 24 children 2 to 14 years old. The changes that took place belonged to her field hyperactivity and the main behavioral characteristics described were irritability, anxiety, and sleep disorders, which were consistent across age and gender and were graded by them the parents themselves. It is understood that colorful cereals should be avoided and those with lower sugar content are preferred. Soft drinks and juices, most of which are artificially colored and flavored, must be replaced with fresh juices.

Figure (3): toxic and preferred foods in ADHD

4. Physical Activity and ADHD

In the world of preschool children, movement dominates and plays a key role. During childhood, the movement until the first 6 years of the child's life is referred to as the years of motor experimentation, motor creativity, and unlimited motor energy and action. In addition, through the motor activities performed by the child, he builds his personality and its areas such as the cognitive and socio-emotional sectors. [30] But what is physical activity and what are its benefits? According to the World Health Organization, physical activity is any form of muscular effort that contributes to an increase in energy expenditure above the level of physical relaxation. In addition, physical activity in any form (organized or free) is the improvement of aerobic skills and motor skills aimed at cognitive development. [43] More specifically, research has shown that physical activity has positive effects on the motor performance of preschool children [41] while sedentary activities reduce motor performance. [32]

Also as mentioned above, the level of physical activity is positively directly related to cognitive functional skills during the child's development. According to [37] Beneficial functions of the human brain are also perceptual skills, IQ, academic performance, understanding of mathematical concepts, and course developmental level. With the data collected by the research of [42] which concerns the physical activity instructions for preschool children, our country is not included in this review as in Greece nothing has been published for any age category. For this reason, instructions for children aged 3 to 7 years will be reported, taking into account the data on the physical activity of children in Greece so far and the instructions of the World Health Organization (WHO). Preschool age is a special period in a

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child's life, as the main characteristics of an integrated personality and the foundations of each child's development are laid before the formal process of education begins. For the healthy development of children, sedentary time and inactivity for more than an hour a day. Children of this age should be active for about 180 minutes a day at any intensity. [31] All children from birth to the age of five should engage in daily physical activity. More specifically, school-age children should be involved in activities for at least 60 minutes a day from moderate to high intensity. In addition, children of this age should include activities that strengthen muscles and bones at least 3 times a week according to WHO. Most of the physical activity should be aerobic, with moderate intensity and continuous duration, while activities of high intensity and muscle requirement should be performed 3 times a week. [31] More analytically important is the daily commute to and from school as well as the daily school activities.

5. Positive effect of physical activity

According to Sir A. Crichton in 1798 the first bibliographic report on Attention Deficit Hyperactivity Disorder became known. The clinical picture of children with ADHD is hyperactivity, inability to concentrate, avoid prolonged relationships with adults, motor awkwardness (comorbidity), incoherence, discontinuity and thought disorder, aggression, inability to copy activities, inability to copy, and impulsivity [41] The diagnostic criteria according to the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) are divided into two categories the symptoms of inattention and the symptoms of hyperactivity. Alyx Taylor and his colleagues [49], implemented a program of mixed physical activity, lasting 40 minutes, 2 times a week for 11 weeks. The purpose of this research was, through the ADHD Rating Scale-IV, to highlight the contribution of the Physical Activity program in reducing impulsivity, distraction, and hyperactivity. According to the results of this research, the symptoms of ADHD decreased by 15.4% in the 6th week compared to the beginning and 38.5% in the 11th week compared to the beginning. The results appeared in the research profiles and it is noteworthy that physical activity in children with impulsivity, distraction, and hyperactivity works positively for its clients.

6. Interventional management of ADHD

The interventional management of ADHD includes pharmaceutical and non-pharmaceutical methods depending on the case, where they are accompanied by a range of advantages and disadvantages. By consciously undertaking the non-drug intervention method, we distinguish six combined steps which consist of parent guidance, classroom behavioral interventions, cognitive-behavioral therapy, neurofeedback, psycho-education, and of course exercise and nutrition. In addition, according to the research findings of [35,40,33,38], it appears that moderate to high-intensity aerobic exercise has beneficial effects. At the same time according to [47]psychomotor intervention has therapeutic effects in terms of fine and coarse motor functions, the improvement of social skills, and finally the improvement of self-perception and self-esteem of its client.

7. Psychomotor Intervention as a therapeutic model

Psychomotor Therapy has been described since the early years as an experimental study of mental and perceptual processes. Even today it is used in psychology when referring to the cognitive dynamic elements of motor behavior. [46] Psychomotor activities can be referred to as a concept that concerns the combination of physical, motor, and mental processes. Child development is always a psychomotor development. Therefore, Psychomotor intervention is considered the perspective of a special development where movement is the most important means of human expression. In summary, aims at stabilizing the personality through motor

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stimuli, strengthening confidence, at individual skills, and seeking to normalize motor difficulties and problems that arise in the social environment of the client. [44] Many more researches and endless Greek and foreign bibliography have proved that helps a lot for children with ADHD. Specifically, a study, [47] wanted to highlight the effectiveness of a psychomotor program in children with ADHD. The research aims to compare the psychomotor intervention and cognitive performance of children with ADHD who participated in a psychomotor program, with children with ADHD who did not participate in a psychomotor program. 20 sessions of Psychomotor activities were applied (1 each week lasting 50 minutes) and the areas of interest were, tonicity, laterality, balance, body concept, and Spatio-temporal orientation. Each session started with a 5-minute stretching program and was followed by a psychomotor program with activities in the psychomotor activities areas of interest. The program closed with 5 minutes of relaxation exercises. At the end of the program, the cognitive and psychomotor control was re-evaluated, not only for the 2 treatment groups but also for the control group.

The results showed statistically significant differences in favor of the treatment group that did the psychomotor program compared to the treatment group that did not, with a more statistically significant difference appearing in the field of tonality and secondarily in laterality and balance. From the above research, it is concluded that in any case, Physical activity can contribute significantly to the control of impulsivity, distraction, and hyperactivity in children with ADHD, as well as improve their tone, laterality, and balance. Experts today, knowing that childhood is the most critical of all, point out that the prevention and shaping of eating habits and physical activity behaviors should begin as soon as possible to form positive attitudes toward physical activity and healthy eating.[39] Research findings show that if children maintain healthy tendencies until adolescence the chances intersect the positive to form a healthy adult. [36]

8. Gadgets to regulate the nutrition and physical activity of children with ADHD

ADHD is a multifactorial disorder and its causes are not widely known. People with ADHD are explorers of the universe whether it is the physical world or their inner world. They are curious and anxious. They take every detail with enthusiasm and with the high levels of creativity they possess they can compose conceptual bonds that did not exist before. Its treatment is based on a combination of methods, including healthy eating as it is one of the five components of brain training [5] and physical activity during which the body activates neurophysiological responses to trigger the connection of neurotransmitters and to approve neurotrophic factor derived from the brain and increase blood flow to the brain, thus improving neuroplasticity and enhancing the ability to process information. These effects can alleviate the symptoms of ADHD and their comorbidities and facilitate nerve development and regulation in the brain of children with ADHD. [6] Nutrition and physical activity should be applied individually to each individual under the supervision of appropriate scientists. [1]

Throughout the days when new technological advances are regularly presented, computer applications (ICTs) were created to regulate the diet and exercise of people with ADHD to provide regulation of the symptoms of the disorder. Smart devices connect to the internet to collect disrupted user data, data history is stored in cloud systems so parents, therapists, and individuals themselves can monitor their progress, and emotional intelligence algorithms can extract data to identify the right time for the individual to receive food, activity and stimuli, characteristics that will function positively in the body of individuals and enhance their integration into the educational environment and society as a whole. [2-4] The largest portion of people involved in technology as ordinary users have a computer, smartphone, and tablet in their daily lives. Through the available stores of each operating system, users can

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download applications either for free or for a fee that will meet some of their needs. However, some handy applications can improve some of the major difficulties a person with ADHD faces. People with ADHD find it difficult to organize their time, focus on the work assigned to them by the therapist or their parent, and follow each of their tasks within the scheduled time frame. Respectively, regarding their diet, they need to follow a balanced diet program and regarding their sports activity to be performed regularly, in an organized time frame. For these reasons, there are applications that anyone can introduce on their web device to improve the planning and daily life of people.

Technological gadgets that provide solutions to the daily needs of people with ADHD are high-tech watches for those who find it difficult to estimate and follow the time they need for their work, a major difficulty of the disorder is the lack of attention time which increases and the stress of individuals. High-tech watches have multiple timers so that people can watch each of their tasks separately. These watches inform the user through a vibrating message when he should relax, at what stage of his exercise he is, and when he raises his pulse they respond with positive messages such as "be positive". Such watches are also useful when the work started by the user is related to a food break or when the work is related to some form of sports activity. Another positive is that the parents of the children receive a complete history of the activities that their children performed during the day and aim every day to achieve another small achievement but also in case the children omit some of their activities they are aware of. Smartwatches are part of the leading technology of the 20th century which is the technology of web objects that are integrated into a network and with integrated sensors extract results from the data received by the user, which without this technological development would take months and of course, we are referring to the Internet of Things technology that has come to provide solutions in many areas such as special education. [2]

Another part of the time management puzzle is the "moving" alarm clocks. Many people with ADHD find it difficult to fall asleep at night, which makes it difficult for them to wake up in the morning and even more difficult to motivate them to perform some physical activity. Movable alarms force the user to get out of bed, stop the alarm clock and perform its scheduled tasks. These watches are a very smart gadget because it jumps from the nightstand for example and wanders around the room until the user gets up and turns it off. Similarly, using as a gadget a mobile phone or a tablet many applications can be used by people with ADHD to keep their program organized and reduce their stress for the implementation of their daily activities but also to train their minds as well as to feel that they are gaining self-control and that they are performing their duties on their own like their peers. Similarly, these applications help parents to teach their children skills such as problem-solving, self-control, planning, and persistence at work. The success of the applications does not stop at the organization of the work of people with ADHD. Many applications have been made in addition to educating people with ADHD about their mind and body through physical activity. For example, amid the Covid-19 pandemic, when sports venues were closed, these applications were an ideal solution for training the mind and body of individuals. People with ADHD thanks to these applications acquired the appropriate well-being, externalized their energy and physical exercise helped them to concentrate. With the help of activity trackers and a device, they made their personal space, sports field and their parents had all the necessary data of their training but also a complete picture of their children's physical effort, their heart rate, and the overall picture of their sports activity. They watched the runs, the bike rides, and the swimming and could share the data with the coach, the teacher, and the appropriate therapist even though he was not in the same place and the protocols of the pandemic were observed. In the same way, these applications are a

balanced lifestyle pattern for people who need to feel that they are achieving their individual goals despite the difficulties of their disorder. Fitness applications can provide access to training videos and customized workouts for every level of fitness and additional exercises at any time of the day in case the person is in a state of hyperactivity. At the end of the workout, some applications suggest healthy snacks and meals supplement the necessary nutrients according to the instructions of experts.

Similarly, many applications have been created to strengthen the mind and bodies of people with ADHD. Some of them promote weight loss, diet, drinking water, healthy snacks, and more. An important role is played by the monitoring of calories and activity as well as informing the applications of the applications for the desired goal for weight gain/reduction in a healthy way, etc. Educate people about healthy eating habits, remind them to drink water, inform parents about healthy recipes, and allow them to exclude materials and foods that do not benefit the training of the mind of individuals and are an aid to individuals and their parents to "feed" the brain of children with ADHD with beneficial and only foods and to deviate toxic to the body components from the daily life of their children. It is important to note that many people with ADHD, from teens to adults, have found success in assigning important memory and productivity tasks to their mobile devices. Applications help people organize their tasks, prioritize the most important and create structure in their daily lives. Using applications can also reduce overvoltage and increase their productivity to make the most of their day. How the user selects the appropriate application is obtained by reading the instructions for use and installation in the operating system he uses and studying the reviews of other users. The use of applications will be successful when parents are taught skills and strategies for managing and reducing their child's behaviors. It is known that exercising the mind and body helps focus and attention. In this way, the excess energy can be reduced and the person can be relieved of symptoms of anxiety and depression.

9. The role of mobile Applications in ADHD

The of digital technologies in education domain is very productive, successful, facilitates and improves the educational procedures via Mobiles [55-63], various ICTs applications [64-98], AI & STEM [99-111], and games [112-117]. Additionally the combination of ICTs with theories and models of metacognition, mindfulness, meditation and emotional intelligence cultivation [118-131] as well as with environmental factors and nutrition [52-54], accelerates and improves more over the educational practices and results.

More specifically, the effectiveness and safety of treatments for attention-deficit/hyperactivity disorder (ADHD) have been proven by reliable scientific studies and meta-analyses. However, next to verified treatments by psychologists and psychiatrists, there also exist many mobile apps that claim to provide treatment or training.

Internet applications for mobile phones manage to help people with ADHD in managing their time and in the proper planning of their time through online programming. In this way, they take control of their day into their hands. They know all their obligations and are notified through notifications for them as well as for their appointments, their family and work obligations.[53] They record their long-term and short-term tasks and their applications let them know how much time is left until the start of their work. The statements of people with ADHD about the benefits offered by the applications that have been made to improve the daily life of people were of interest. As they mentioned, their applications help to organize their daily life. Applications do not eliminate the symptoms of ADHD but allow them to evolve from technicians to productive users. They were given the organization of time that the disorder deprived them of. They manage to set goals and monitor their progress. They increase their

focus and attention and set their daily and weekly schedule increasing their productivity. Also through the applications, people with ADHD can more easily manage the organization of their money. With the corresponding bar and pie charts in the analytics of the applications, they understand their finances so that they know how they will save their money. And the most important thing that the applications provide is the respective notifications to the user about his obligations, such as when he has to take his medication, whenever he has to pay for his car insurance when he has to pick up his child from school and everything related to the organization of the individual time. There is an application that helps the user who forgets to turn on / off the ringtone on his mobile phone when he forgets it in mute. There is an application for those users who tend to ignore, snooze or turn off their alarm clock and another that includes location-based reminders, calendar synchronization, productivity monitoring, job postings via email, and more. In addition, there is an application for those whose brain moves faster than they can write with the help of voice dictation which is a great tool, and another that monitors the sleeping habits of users and shows them graphs based on how well or badly they slept last night. Warns them if they are running out of sleep and informs them whenever they need to return to stable sleep habits.

In conclusion, we realize that many useful mobile applications have been created that aim to improve the quality of life of people suffering from the symptoms of ADHD and it is obvious that technology manages to make people productive and with less stress since they are solved more and more difficulties through their applications.

10. Discussion

Issues related to nutrition and physical activity are often overlooked by parents, therapists, and educators and it would be good to have a holistic approach and be adequately framed along with behavioral / psychotherapy interventions in ADHD. Current research in these areas provides interesting data on the role of diet and physical activity in the associated developmental disorder and provides a basis for developing new intervention plans based on evidence from an interdisciplinary perspective. In addition, applications were presented that effectively help children with ADHD in the organization of their program, a very important key to their autonomy. Given the complexity of ADHD, the appearance of the child at a young age and the persistent onset of symptoms from early development to adulthood, the findings of this work could also contribute to developing guidelines/suggestions for improving the educational ability and care of these children. Improving the nutritional and physical condition will help increase the quality of life of children and more positive emotional regulation as observed. As a final thought, the study of how diet and physical activity are linked is a growing field of research and the results obtained so far are promising. The ultimate goal is to facilitate new ADHD intervention strategies where nutrition and physical activity will have a prominent place, either individually or in addition to other interventions for the prevention of diseases such as obesity.

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