

Concentration Techniques in the Classroom for Children with ADHD, in an Educational Unit in the Province of Santa Elena

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KEYWORDS

ADHD (Attention Deficit Hyperactivity Disorder), Concentration, Techniques, Academic Performance, Positive Reinforcement

ABSTRACT

This study analyzes the effectiveness of various concentration techniques applied in classrooms for children with Attention Deficit Hyperactivity Disorder (ADHD) in an educational unit in Santa Elena. Employing a mixed-methods approach, surveys and interviews with teachers were examined, and the behavior of students with ADHD was observed. The findings suggest that strategies like environmental adaptation, use of visual and auditory signals, and positive reinforcement are effective in enhancing concentration and academic performance of these students. It is concluded that the implementation of specific concentration techniques, tailored to the size and resources of each institution, is crucial to support students with ADHD, thereby improving their academic performance and satisfaction.

1. Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is a disorder that affects a large number of students around the world. This disorder can have a significant impact on students' ability to concentrate and academic performance. Below is a theoretical framework that explores various techniques and approaches to improve concentration in students with ADHD.

Attention deficit hyperactivity disorder (ADHD) is one of the most common neurobehavioral disorders in childhood, characterized by problems paying attention, hyperactivity, and excessive impulsivity. This generates significant difficulties in the academic and behavioral performance of students. In an important primary school in the province of Santa Elena, Ecuador, a considerable number of students with a diagnosis of ADHD have been detected who have serious difficulties concentrating on schoolwork.

Faced with this problem, this paper analyzes different techniques and strategies to improve the levels of attention and concentration in the classroom, based on recent scientific evidence. Interventions such as modifications of the environment, use of visual and auditory cues, scheduled breaks, positive behavioral and academic reinforcement, among others, are explored.

The objective is to determine what techniques could be effectively implemented in this institution, to enhance learning capacities and reduce disruptive behaviors of students with ADHD. The results of this study will allow the development of specific recommendations so that teachers can better support these students in their educational process.

State of the art

Attention Deficit Hyperactivity Disorder (ADHD) is an area of active research in recent decades. Several studies have examined the prevalence, causes, impact, and treatment options for childhood ADHD (Thapar & Cooper, 2016). ADHD has been found to affect around 5% of children globally, being more prevalent in boys than girls (Faraone et al., 2015).

Current research points to genetic, environmental, and neurobiological factors as the cause of ADHD. Brain imaging studies have revealed differences in brain function and structure in people with ADHD (Cortese et al., 2012). Other studies seek to identify early markers of risk for ADHD in early childhood (Sokolova et al., 2017).

In the educational context, research has focused on the impact of ADHD on learning and pedagogical alternatives. ADHD has been found to be strongly associated with academic, behavioral, and social-

emotional problems (Loe & Feldman, 2007). Multimodal interventions that combine pharmacotherapy, pedagogical modifications, and behavioral therapy have shown the best results (Antshel et al., 2011).

Within non-pharmacological interventions, mindfulness and executive function training techniques have shown usefulness, but more research is needed (Razza et al., 2021). The use of technology and video games is also an emerging area to support learning in children with ADHD (Bul et al., 2016). Therefore, there is a growing interest in identifying effective educational interventions for ADHD

Objectives and scope of the research

The main objective of the study entitled "Concentration techniques in the classroom for children with ADHD in an educational unit in the province of Santa Elena", is to evaluate the effectiveness of concentration techniques implemented in the classroom for children with ADHD in an educational unit, through the characterization of the population of children. identification of the strategies used, analysis of perceptions and proposal for improvements, in order to establish recommendations for teacher training in effective concentration techniques for students with this disorder.

To achieve this goal, the research will cover the following specific objectives:

- To characterize the population of children with ADHD in the Educational Unit, in terms of behavioral and academic manifestations.
- To analyze the current techniques and strategies used by teachers to improve the concentration of children with ADHD.
- Propose improvements or adaptations to existing techniques for concentrating attention, including recommendations for teacher training

The scope of the research

The study covers an educational unit that has adopted concentration techniques especially aimed at children with ADHD, in the province of Santa Elena.

It is also expected that the conclusions obtained, as derived from the study, will be applicable to educational units located in other regions and that share similar characteristics.

2. Methodology

The research focused on concentration techniques within the classroom for children with ADHD in an Educational Unit in the province of Santa Elena, is proposed as a means to understand and improve the attention and behavior in the educational context of these students.

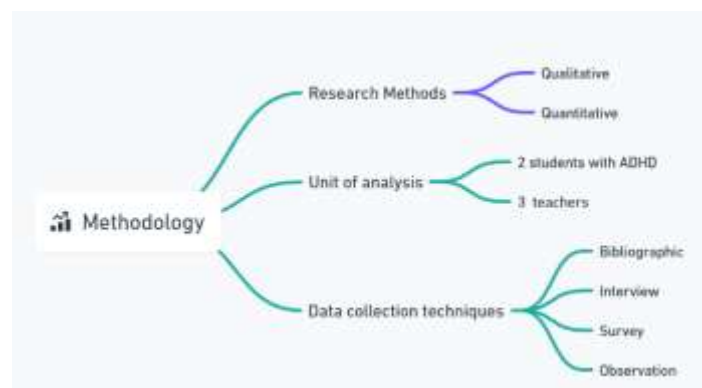


Fig 1. Methodology

The methodology adopted for this study combines quantitative and qualitative approaches to provide a comprehensive understanding, complemented by a rigorous bibliographic study that theoretically grounds the research.

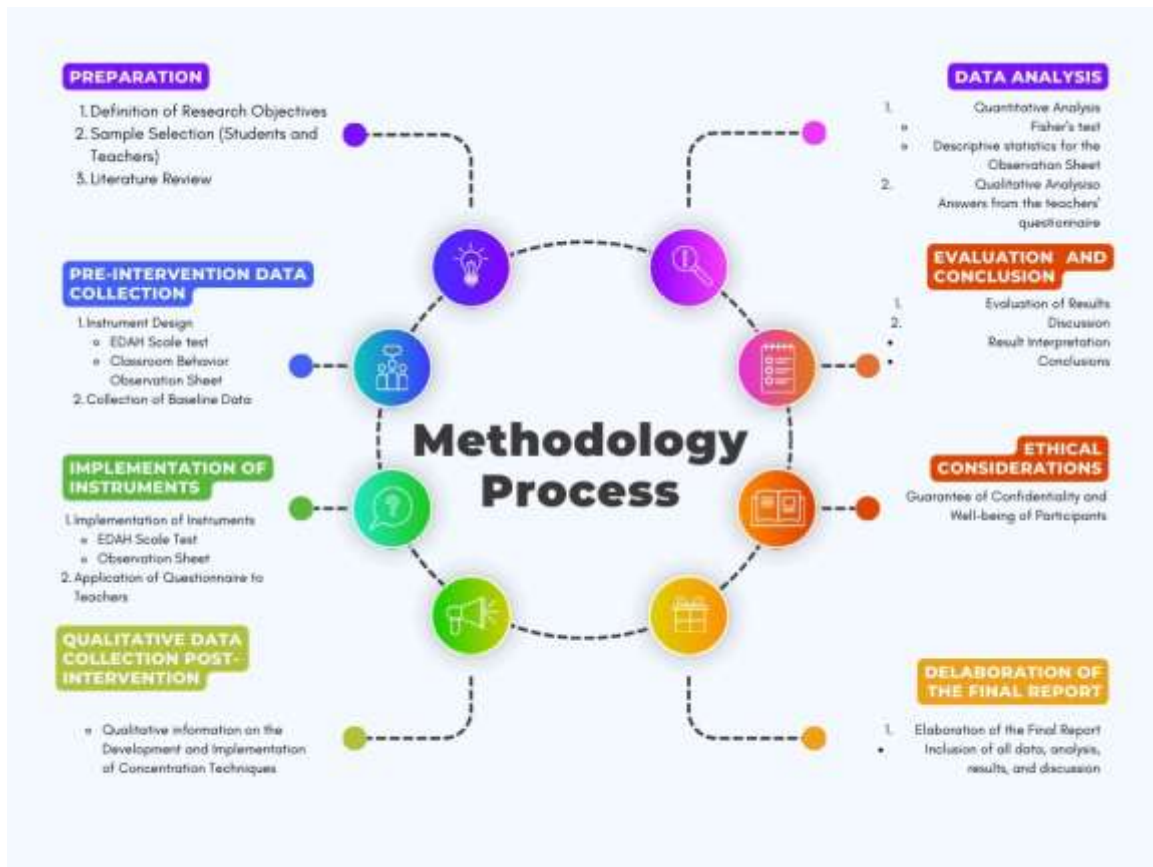


Fig. 2 Methodological process

Research Design

The research is based on a mixed design, with quantitative and qualitative components, and is enriched by a detailed bibliographic study.

Bibliographic study

Objective: To build a solid and up-to-date theoretical framework.

Procedure: Systematic review of academic literature, scientific articles and relevant publications on ADHD and concentration techniques in the classroom.

Expected Results: A robust theoretical framework, identification of effective concentration techniques and validation of research instruments.

Sample

Students: Two (2) students diagnosed with ADHD from the Educational Unit, one of them being grade 3 and the other grade 5.

Teachers: Three (3) teachers in charge of the aforementioned students.

Data Collection Instruments

EDAH Scale Test

Objective: To evaluate the selective attention and concentration of the intervened students

Characteristics: It consists of identifying and marking specific characters under a limited time.

Evaluation: The number of correctly marked characters and the errors made are evaluated.

Classroom Behavior Observation Worksheet

Objective: To observe and record the behaviors of students in the classroom.

Scale: Likert type, evaluating aspects such as attention, participation and behavior in general.

Theoretical foundation

Attention Deficit Hyperactivity Disorder (ADHD)

Attention Deficit Hyperactivity Disorder (ADHD) is a neurobiological condition that affects children's attention span, impulsivity, and activity level (Escofet, Fortea, Bosch, Espinás, & Abad, 2023). It is characterized by problems paying attention, hyperactivity, and excessive impulsivity, which generates significant difficulties in students' academic and behavioral performance (Thapar & Cooper, 2016).

The prevalence of ADHD is around 5% in boys worldwide, being more frequent in boys than in girls (Faraone et al., 2015). Diagnosis is based on the observation of the core symptoms of inattention, hyperactivity, and impulsivity, which must occur before the age of 12 and in more than one context of the child's life (APA, 2013).

ADHD negatively impacts children's academic performance due to the associated attention deficits and executive functions. Children with ADHD have more difficulty completing tasks, following directions, organizing, and remembering homework (Daley & Birchwood, 2010).

ADHD and inclusive education

In Ecuador, Ministerial Agreement 295 guarantees the right to inclusive and quality education for students with special educational needs such as ADHD, making the necessary curricular adaptations (Ministry of Education, 2013).

Teachers have the responsibility to implement curricular, methodological, and environmental adaptations to support the learning process of students with special needs such as ADHD (Ministry of Education, 2013).

ADHD Interventions in the Classroom

In the classroom, teachers can implement behavioral interventions such as positive reinforcement, assignment modification, environmental accommodations, and structured routines to support students with ADHD (DuPaul, Eckert, & Vilaro, 2012).

Other effective strategies include modifications to the physical classroom environment, the use of visual and auditory cues, and the division of tasks into smaller, more manageable steps (Mulrine, Prater, & Jenkins, 2008).

De León, M., & Martínez, M. (2020), implemented a simple multisensory intervention to treat ADHD in children between 6 and 12 years old, achieving a 19% reduction in global ADHD symptoms. The intervention, based on the senses of sight, touch and hearing, along with higher cognitive functions, was designed to be easily used by teachers and parents, especially in rural areas or places without specialized centers for ADHD

On the other hand, Manrique, A. (2019), developed pedagogical actions for the care of children with ADHD, focusing on a qualitative paradigm supported by action research. The study focused on the phases of diagnosis, planning, execution and evaluation, concluding the need to design activities for the attention of diverse behaviors manifested by schoolchildren with ADHD

Techniques to Improve Concentration in Children with ADHD

Among the recommended techniques are adapting the physical space of the classroom, establishing clear routines, using visual and auditory reminders, dividing tasks into steps, allowing breaks, and

performing mindfulness exercises (Rusca & Cortez, 2020).

Mindfulness training and scheduled physical activity have also been shown to improve attention levels in children with ADHD (Mulrine, Prater, & Jenkins, 2008).

One recommendation is to give clear, simple, and organized instructions (Ardila & Rosselli, 2007). Parents should make sure that the child understands what to do, otherwise they will quickly lose focus. It also helps to complement verbal instructions with visual supports (Franco, 2014).

Another important technique is to control distracting stimuli from the environment (Guajardo Serna & Henao López, 2015). Kids with ADHD are easily distracted by noises, lights, or objects. Therefore, it is recommended that they study in a quiet and orderly place.

Dividing tasks into small steps also facilitates concentration (García Pérez & Magaz Lago, 2011). Children tend to spread out if they must focus on a single prolonged activity. Taking scheduled breaks between tasks can help.

Physical activity improves concentration by releasing neurotransmitters (López Chacón, 2007). Breathing and relaxation exercises are also helpful to calm the child's mind before a task that requires focus.

Finally, positively reinforcing the child's achievements in concentration improves their motivation (Ruiz, 2006). Acknowledging their efforts increases the likelihood that they will repeat that successful behavior. With patience and consistency, these techniques can make a big difference.

ADHD Teacher Training

Educators should receive training on ADHD in order to be able to identify children at risk early and implement appropriate pedagogical supports in the classroom, as stipulated by educational regulations (Ministry of Education, 2013).

A multimodal, interdisciplinary approach with family support is required for effective management of ADHD in schools (Antshel, Faraone, & Gordon, 2011).

Family Involvement

Combined parent-child training has been shown to be effective in improving the core symptoms of ADHD in young children through behavioral strategies and psychoeducation (Abikoff et al., 2015).

Establishing clear boundaries, routines, and positive reinforcement at home is crucial to improving the behavior of children with ADHD (Loe & Feldman, 2007).

The EDAH Scale

The EDAH Scale (Farré-Riba & Narbona, 1997) is an instrument designed in Spain for the assessment of attention deficit hyperactivity disorder (ADHD) in children and adolescents. It consists of 20 items divided into two subscales: hyperactivity-impulsivity and attention deficit. Each item is scored from 0 to 3 based on the frequency observed. The scale has demonstrated adequate psychometric properties in Spanish samples, with an internal consistency of 0.93 and a test-retest reliability of 0.87 (Farré-Riba & Narbonne, 1997).

In a study with 398 children, the EDAH Scale showed the ability to significantly discriminate between subjects with and without ADHD (Rodríguez et al., 2009). The cut-off points proposed by the authors were: 0-12 for subjects without ADHD, 13-19 for mild ADHD, 20-35 for moderate, and >35 for severe. More studies with representative samples are required to confirm the diagnostic validity of the EDAH Scale in the Spanish population.

Assessment of ADHD symptoms with the EDAH Scale in Ecuadorian students

Attention deficit hyperactivity disorder (ADHD) is one of the most common mental health problems in children and adolescents, with an estimated prevalence of 5% globally (WHO, 2019).

In Ecuador, an epidemiological study reported an ADHD prevalence of 19.8% in children aged 6 to 11 years in the city of Cuenca (Allauca et al., 2021). This condition can have a significant impact on students' academic performance. Therefore, early detection and accurate assessment of ADHD symptoms in the school context are essential to offer effective interventions.

The EDAH Scale is a validated instrument in the Spanish population that has proven useful for the assessment of ADHD. In order to explore the applicability of this instrument in Ecuador, the EDAH Scale was administered to a sample of students with suspected ADHD from an educational unit in the city of Santa Elena. The results of this study are presented below.

3. Result and Discussion

Evaluation Of Attention Deficit Hyperactivity Disorder- Edah

According to the notes of the EDAH Assessment, the following results can be seen:

OBJECTIVE	RESULTS
It allows the main features of ADHD to be assessed in a simple and objective way by means of of the information provided by the teacher of the subject under study	H- CENTILE 99- RISK DA- CENTILE 85- NORMALIZED CFCENTILE99RISK H+DA+TC 99 - RISK

The 10-year-old N.N1 evaluated, is currently studying the 5th EGB, in the areas contemplated by **H-CENTILE 99- RISK, TC- CENTILE 99- RISK, H+DA+TC 99 - RISK**, which indicates that he presents traits of ADHD with a predominance of hyperactivity, since it is evident that he has low control of his impulses.

It is recommended:

- Although the person being evaluated has the ability to learn on a regular basis, it is necessary to provide him with more time due to his difficulty in the attentional area, considering that as a **GRADE 1 OF CURRICULAR ADAPTATION**.
- Create school routines within the home to strengthen autonomy and organization.
- Control the use of devices in order to improve their attention and interrelation with the external world.
- Training and psychopedagogical follow-up with the aim of developing cognitive skills necessary for learning.
- Continue with Neurology consultations.

According to the notes of the EDAH Assessment, the following results can be seen:

OBJECTIVE	RESULTS
It allows the main features of ADHD to be assessed in a simple and objective way by means of of the information provided by the teacher of the subject under study	H- CENTILE 98- RISK DA- CENTILE 99- IRRIGATION CFCENTILE98RISK H+DA+TC 99 - RISK

The evaluated N.N2., 09 years of age, is currently studying the 4th EGB, in the areas contemplated by **H- CENTIL 98- RISK, DA- CENTILE 98 - -RISK, TC- CENTILE 99- RISK, H+DA+TC 99 - RISK**, which indicates that he presents traits of ADHD with a predominance of hyperactivity, attention deficit and conduct disorder, since it is evident that he does not have control of his impulses and is easily distracted.

It is recommended:

- Carry out curricular adaptation grade 2.
- Create school routines within the home to strengthen autonomy and organization.
- Control the use of devices in order to improve their attention and interrelation with the external world.
- Training and psychopedagogical follow-up with the aim of developing cognitive skills necessary for learning.
- Continue with Neurology consultations.
- Attend psychological therapies.
- Place it in a stable and controlled place within the classroom, always in front of and close to the teacher.
- Look for activities with movement taking into account that the learning style is Kinesthetic.

Quantitative analysis of the survey of teachers (3)

100% of teachers report currently having students with ADHD in the classroom. This suggests that it is a common phenomenon in the sample.

The average number of students with ADHD per classroom is 2 (range 1-4). The standard deviation is 1.53.

The average concentration level reported is 3 on a scale of 1-5. The standard deviation is 0.

A single-sample t-test could be done to compare the average concentration level (3) versus the midpoint of the scale (3) to assess whether it differs significantly.

The most commonly used strategies are structured time and positive reinforcement (100% of teachers). Frequencies and percentages could be calculated for all strategies.

100% consider it important to address this issue and are willing to do more training.

1 in 3 teachers have received training on ADHD

The null hypothesis (H_0) is proposed: *There is no relationship between teacher training and strategies or perceptions.*

The Fisher exact test is used because it is a small sample.

The calculated p-value is 1.0, greater than the significance level $\alpha=0.05$.

Therefore, the null hypothesis is not rejected.

There is no statistically significant evidence to affirm that there is a relationship between receiving teacher training on ADHD and the strategies or perceptions reported with this small sample.

A larger sample would be needed to have sufficient statistical power to detect a possible association between these variables.

In short, Fisher's exact test did not find a statistically significant relationship, but it is limiting due to the small sample size. Broader research is required to reach more robust conclusions about the relationship between teacher training and ADHD management

Qualitative Analysis of the Survey Aimed at Teachers (3)

Strategies Used to Improve Concentration: Teachers have mentioned various strategies, such as structured work time, relaxation techniques, positive reinforcement, modifications in the physical environment, use of graphic organizers, and songs. These strategies reflect a diverse approach to addressing the concentration of students with ADHD.

Specific Training: One of the teachers has received specific training on how to work with students with ADHD, while another has not received any training. This highlights the variability in teacher preparation to address the needs of students with ADHD.

Challenges and Suggestions: Reported challenges include difficulty maintaining attention and disruptive behaviors. Suggestions for improving classroom conditions include increased individualized support, frequent training for teachers who have students with special educational needs (SEN), and the existence of a specific place and support material for working with children with SEN in the classroom.

Importance of Addressing the Concentration of Students with ADHD: All teachers consider it very important to address the concentration of students with ADHD in the school environment, which highlights the relevance attributed to this issue.

Willingness to Participate in Additional Training Workshops: Teachers are willing to participate in additional workshops or training sessions on concentration techniques for students with ADHD in the future, reflecting an interest in further developing their skills in this area.

Additional Comments and Resources Used: Additional comments have been provided on the need for training to address crises in the classroom, as well as the importance of a classroom in specific conditions for the learning of these students.

The qualitative analysis reveals the diversity of strategies used by teachers, as well as the importance attributed to specific training and individualized support to address the needs of students with ADHD. The suggestions provided highlight the need for a multidisciplinary approach and specific resources to enhance the educational experience of these students.

Intervention Strategies to Improve Concentration in Children with Attention Deficit Hyperactivity Disorder (ADHD): A Multidisciplinary Analysis

In the field of academic research, various techniques have been studied and applied to improve concentration in children diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). Below are some of these techniques, written in academic language and in APA format:

Behavioral Therapies: Behavioral interventions, which include behavior modification techniques, are widely recognized for their effectiveness in managing ADHD in children (DuPaul, Gormley, & Laracy, 2013). These therapies focus on establishing clear structures and routines, as well as reinforcing positive behaviors and deterring negative ones.

Social Skills and Self-Control Training: Training in social skills and self-control techniques, such as mindfulness practice, has shown promising results in improving concentration and reducing impulsivity in children with ADHD (Zylowska et al., 2008).

Psychoeducational Interventions: Psychoeducational interventions, which involve educating children and their families about ADHD and strategies to manage its symptoms, are critical to improving self-awareness and self-management in children with this disorder (Barkley, 2014).

Physical Exercise and Outdoor Activities: Regular physical activity, especially in outdoor settings, has been associated with improvements in concentration and reduced symptoms in children with ADHD. Studies have shown that exercise can act as an effective adjunctive treatment (Gapin & Etnier, 2010).

Biofeedback and Neurofeedback Techniques: Biofeedback and neurofeedback are techniques that teach children to regulate their brain and physiological activity. These techniques have been shown to be

effective in improving attention and reducing hyperactivity in children with ADHD (Gevensleben et al., 2009).

Cognitive Stimulation Therapies: Cognitive stimulation, which includes games and activities designed to improve specific brain functions, is another technique that has been studied in the context of ADHD. These activities are aimed at improving working memory, sustained attention, and other key cognitive skills (Klingberg, 2010).

Diets and Nutritional Supplements: Although still an area of research in development, some studies have suggested that specific diets and nutritional supplements may have a positive impact on the concentration and overall behavior of children with ADHD (Millichap & Yee, 2012).

4. Conclusion and future scope

The study conducted in an educational unit in the city of Santa Elena, Ecuador, provides significant conclusions about concentration techniques for children with ADHD. From the findings and the literature review, the following conclusions are derived:

Effectiveness of Concentration Techniques: Strategies such as adapting the environment, using visual and auditory cues, dividing tasks into smaller steps, scheduled breaks, and positive reinforcement have been shown to be effective in improving concentration and academic performance for students with ADHD

Implementing specific techniques, tailored to students' individual needs, is crucial to support their learning and reduce disruptive behaviors

Recommendations for Teacher Education: It is essential that educators receive training on ADHD to identify children at risk early and implement appropriate pedagogical supports in the classroom, in accordance with educational regulations

A multimodal and interdisciplinary approach with family support is required for effective management of ADHD in schools

Family Involvement: Combined parent-child coaching has been shown to be effective in improving the core symptoms of ADHD in young children through behavioral strategies and concentration techniques

Recommendations for the Management of ADHD in the Classroom

Based on the conclusions of the study and the literature review, the following recommendations are proposed for the management of ADHD in the classroom:

Concentration Techniques:

- Give clear, simple and organized instructions, complemented by visual supports.
- Control distracting stimuli in the environment, such as noises, lights or objects.
- Break tasks down into small steps to make it easier to focus.
- Take scheduled breaks between tasks.
- Encourage physical activity, breathing exercises, and relaxation to improve concentration.
- Positively reinforce the student's achievements in concentration to improve their motivation

Teacher Training:

- Educators should be trained on ADHD to identify at-risk children early and implement appropriate instructional supports in the classroom, in accordance with education regulations

- A multimodal and interdisciplinary approach with family support is required for effective management of ADHD in schools

These findings and recommendations highlight the importance of implementing specific strategies and providing comprehensive support to improve the educational experience of students with ADHD.

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