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STUDY OF ADHD THROUGH MOTOR RHYTHM, LANGUAGE AND SOCIO-EMOTIONAL STUDIES IN CHILDREN WITH AND WITHOUT TYPICAL DEVELOPMENT

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Abstract:

This research study investigates the attitudes, perceptions, and teaching practices of primary education teachers regarding the support of students with Attention Deficit Hyperactivity Disorder (ADHD). Utilizing a mixed-method approach, the study analyzes both quantitative and qualitative data from educators, focusing on the challenges they face, the instructional adaptations they implement, and the types of resources or training they identify as necessary. The findings reveal statistically significant differences and correlations among pedagogical practices, personal beliefs, and observed student behaviors, confirming the critical importance of appropriate teacher training, collaboration with specialists, and curriculum adaptation. Additionally, the results indicate that a higher level of teacher understanding of ADHD is associated with more frequent interventions and a more favorable evaluation of applied methods. The study

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links these outcomes to the theoretical literature on developmental disorders, educational psychology, and inclusive pedagogy, and it proposes directions for future research and institutional policy aimed at enhancing the educational support provided to students with ADHD.

Keywords: ADHD, teachers, instructional adaptations, collaboration with specialists, curriculum adaptation, teacher attitudes, educational support, inclusive education, psychoeducational intervention, primary education

1. Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most prevalent neurodevelopmental disorders of childhood, affecting various aspects of a child's cognitive, behavioral, and social functioning (American Psychiatric Association, 2013). ADHD is not limited to a child's individual functioning, but directly affects school life, peer relationships, and classroom dynamics as a whole. Therefore, the educational management of students with ADHD is a challenge for teachers, particularly in the general education context (Sarris, 2024).

In the Greek educational reality, teachers are increasingly called upon to respond to the needs of these students, often without the necessary expertise or access to support structures (Anagnostopoulos & Karadima, 2015; Sarris, 2021). Curriculum adaptations, the use of differentiated teaching methods and collaboration with specialists are recognised as key tools of pedagogical support, which, however, are not always utilised in a systematic way.

The need for an inclusive approach and the cultivation of sensitivity towards developmental differences has been emphasised by contemporary pedagogical theory, which stresses the role of the educational community in creating a positive climate of acceptance and enhancement of each student's potential (Sarris *et al.*, 2021). Especially in ADHD, enhancing self-regulation, emotional support and the use of symbolic tools, such as storytelling or dramatization, can enhance pedagogical intervention (Sarris, 2020; Barkley *et al.*, 2006).

The present study attempts to capture the attitudes, knowledge and teaching practices of primary school teachers in Greece in relation to the management of students with ADHD. Through a quantitative analysis of data from 83 teachers, the ways in which teachers perceive and manage the disorder, the challenges they face in their daily teaching practice, and their needs for training and support are explored. The study aims to highlight critical factors affecting the inclusive education of students with ADHD, while providing pedagogical and institutional foundations for future intervention.

2. Theoretical Background

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common neurodevelopmental disorders of childhood and is characterized by inattention, impulsivity and hyperactivity (American Psychiatric Association, 2013). The impact of the disorder extends academically, socially and emotionally, and the complexity of symptoms creates significant challenges in educational practice (Barkley *et al.*, 2006).

Students with ADHD often exhibit an inability to concentrate, difficulty complying with rules and organizing their activities, while learning difficulties or psychomotor skills may co-exist (Sarris, 2020). These difficulties affect children's educational integration and equal participation in the school environment, requiring individualised pedagogical interventions. Sarris *et al.* (2024) highlight that speech and communication difficulties, psychomotor dexterity problems and low emotional resilience often co-exist. Teachers are challenged to address these challenges through means that go beyond formal teaching, utilising inclusive approaches and collaborative frameworks.

The international and Greek literature confirms the importance of early identification and pedagogical support for students with ADHD (Anagnostopoulos & Karadima, 2015) while also emphasizing the importance of differentiated teaching, empathy and collaboration with specialists in the management of ADHD (Sarris, 2024). In addition, Gardner (2006), through the theory of Multiple Intelligences, highlights that each child has different types of intelligence, which reinforces the need for multisensory and differentiated instruction, especially for students with ADHD. On the other side, Tomlinson (2014) highlights the importance of an individualized pedagogical approach, arguing that differentiation is not only about the content of instruction, but also about the process, the products of learning and the learning environment.

Differentiating instruction and using active, experiential and collaborative methods (Slavin, 2014; Johnson & Johnson, 1999) contribute significantly to improving the behaviour and participation of students with ADHD. According to Tomlinson (2014) and Slavin (2014), differentiating instruction according to each student's unique characteristics enhances their learning engagement and reduces behavioral adjustment difficulties. At the same time, cooperative learning and active teaching enhance empathy and social inclusion (Johnson & Johnson, 1999).

Sarris (2024) stresses the importance of creating psycho-pedagogical contexts in the classroom, where expression, symbolic thinking and emotional discharge of children can function as mechanisms for restoring the learning relationship. Particular emphasis is placed on the use of creative tools, such as drama, storytelling and puppetry, which contribute to emotional regulation and self-expression (Sarris, 2021). Through these methods, empathy, self-regulation and children's active participation in the learning process are promoted. Within such environments, the role of the teacher is redefined as mediating and empathizing (Sarris *et al.*, 2022).

The pedagogical approach to ADHD requires from the teacher flexibility, knowledge of the manifestations of the disorder and the ability to manage classroom dynamics. Theoretical training, when combined with experiential learning and ongoing reflection, can enhance the teacher's ability to implement effective intervention and support strategies (Sarris, 2024). In this context, education becomes a field of complex pedagogical practice that must incorporate both scientific knowledge and an understanding of the child's psyche.

UNESCO (2017) suggests strengthening inclusive education policies that put the learner at the centre and promote equity through systemic interventions and collaborative frameworks. The school is therefore called upon to act as an inclusive community that supports and empowers all children, regardless of their difficulties. Fostering a positive pedagogical climate, strengthening the teacher-student relationship, and emphasising prevention are key principles of contemporary special and inclusive education, as articulated in numerous recent studies (Sarris *et al.*, 2021; Zentall, 2005). It is worth mentioning that the existence of support structures, collaboration with multidisciplinary teams (psychologists, speech and language therapists, occupational therapists), as well as appropriate training of teachers, are critical conditions for the effective management of ADHD (Sarris *et al.*, 2022; Sarris *et al.*, 2024).

Finally, the psychosocial approach of Sarris (2024) offers a model that integrates pedagogical practice with the psychodynamic understanding of difficulties, focusing not only on the child but also on the child's environment - the classroom, the teacher, the school community.

According to Sarris (2023), the effectiveness of educational interventions is enhanced when the teacher acts as a facilitator of psycho-educational experiences, focusing not only on cognitive development but also on classroom relationships. The synthesis of all these aspects allows for a more complete and functional understanding of ADHD and pedagogical ways of dealing with it.

3. Objectives

The main purpose of this study is to investigate the educational approaches, knowledge and needs of teachers working with students with Attention Deficit Hyperactivity Disorder (ADHD) in the Greek school setting. Specifically, the research seeks to document the strategies implemented in the classroom, teachers' perceptions of the effectiveness of their interventions, the challenges they face, and their level of understanding of the characteristics of ADHD.

The main objectives of the study are:

- 1) To document the pedagogical approaches used to support students with ADHD.
- 2) To assess the level of knowledge and training of teachers regarding ADHD.
- 3) To document the challenges and educational needs.
- 4) To assess the behaviours of pupils with ADHD as perceived by teachers.

4. Materials and Methodology

The sample of the study consisted of 83 active teachers in Greek public and private education. The sample was selected through purposive sampling, as the questionnaire was distributed online to relevant professional groups and networks of teachers.

4.1 Research Tool

For data collection, an anonymous questionnaire was created using the Google Forms platform. The questionnaire was developed based on the international and Greek literature on ADHD, and includes both closed and open questions, allowing for quantitative and qualitative processing of responses. The tool includes the following sections:

- Demographic data (age, gender, qualifications, years of experience)
- Knowledge and understanding of ADHD
- Knowledge and understanding of the disability, knowledge of disability, age, gender, knowledge of disability, knowledge of disability, education, age, age, gender, education and training
- Educational challenges and needs
- Assessment of the prevalence of characteristic behaviours

The last part of the questionnaire was based on the standardized ADHD Rating Scale-IV (DuPaul, Power, Anastopoulos& Reid), which assesses the frequency of ADHD symptom occurrence based on the DSM-IV diagnostic criteria. The scale includes 18 questions divided into two subscales:

- Inattention: Questions 1-9
- Hyperactivity/Proactivity: Questions 10-18

Participants are asked to rate the frequency of each behaviour on a scale from 0 (never or hardly ever) to 3 (very often). The total indices calculated were:

- Total ADHD Score (0-54)
- Total ADHD score (0-27)
- Hyperactivity/Preactivity score (0-27)

The Greek version of the scale is weighted and has high levels of reliability and validity.

4.2 Statistical Analysis of the Data

Data analysis was performed using the SPSS statistical package, following a multilevel approach combining descriptive and inferential statistics. First, descriptive statistics were applied, through which means, percentages and standard deviations were calculated in order to present the main characteristics of the sample as well as the distributions of responses in each section of the questionnaire. For the multiple-choice questions, frequency and percentage analysis were performed to capture the frequency of use of educational strategies, challenges and needs of the participants.

Then, the three key variables related to the ADHD Rating Scale-IV, namely: inattention score, hyperactivity/impulsivity score, and ADHD total score, were calculated. These variables were obtained by summing the responses to specific sets of questions corresponding to the two subscales of the scale, as defined by the DSM-IV diagnostic criteria

To investigate possible differences between groups, non-parametric tests were applied, namely the Mann-Whitney U and Kruskal-Wallis H criteria, as the data did not meet the conditions of normality. Finally, the Spearman correlation coefficient was utilized to detect associations between ADHD subscale scores and other variables such as attendance of training programs, degree and years of teaching experience of the participants. The choice of these methods allowed for reliable and meaningful data analysis, highlighting critical findings for the field of ADHD educational management.

5. Results

Descriptive statistics showed that the arosaxia subscale had a mean of 16.45 (SD = 4.70), with a slightly negative asymmetry (Skewness = -0.379) and high kurtosis (Kurtosis = 1.237), indicating frequent occurrence of related symptoms. The Hyperactivity subscale had a corresponding mean of 16.77 (SD = 5.08), while the total score for ADHD was a mean of 33.23 (SD = 9.38). The variation in the observation of inattention and hyperactivity symptoms in students with ADHD confirms the theoretical basis that ADHD manifests as a multifactorial condition affecting classroom dynamics (Barkley *et al.*, 2006; Sarris *et al.*, 2024).

Table 1. Descriptive statistics of fibrile states and form sector				
Descriptive Statistics	Inattention Subscale	Hyperactivity Subscale	ADHD Total Score	
Range	27.00	27.00	54.00	
Minimum	0.00	0.00	0.00	
Maximum	27	27	54	
Mean	16.45	16.77	33.23	
Std. Deviation	4.699	5.081	9.38	
Skewness	-0.379	-0.317	-0.346	
Kurtosis	1.237	1.04	1.495	

Table 1: Descriptive Statistics of ADHD Subscales and Total Score

The analysis of differences showed that key variables are statistically significantly differentiated according to teachers' training and the teaching approaches they apply in the classroom. ADHD training appears to play a catalytic role in both teachers' understanding of the disorder, symptom recognition and general teaching attitudes.

Specifically, teachers who have received relevant training show higher levels of understanding of ADHD, recognize symptoms such as impulsivity and inattention more often, and report a lower sense of inadequacy in teaching practice. Subsequently, it is noted that teachers show greater awareness of symptoms such as loss of materials, an

element associated with the perception of psychomotor ineptitude (Sarris, 2024). The variable of training significantly differentiates the following parameters. (see Table 2):

Table 2: Statistically Significant Differences Based on ADHD-Related Training

Variable	Mann- Whitney U	Wilcoxon W	Z	p- value
Perceived understanding of ADHD	281.5	512.5	-4.090	<.001
Perceived need for additional training/support	357.0	2373.0	-3.641	< .001
Frequency of behavioral symptom: interrupts others	446.5	677.5	-2.382	0.017
Frequency of behavioral symptom: impatience in group activities	422.0	653.0	-2.685	0.007
Frequency of behavioral symptom: losing necessary materials	477.5	708.5	-2.035	0.042

Similar variations are also found based on teaching approaches. Teachers using differentiated instruction, technology and structured environments report more frequent implementation of adaptations to teaching materials, increased observation of ADHD characteristics and more positive attitudes towards the effectiveness of their methods (see Table 3):

Table 3: Differences Based on Use of Structured Learning Environment

Variable	Mann-Whitney U	Wilcoxon W	Z	p- value
Application of adjustments in educational material	447.5	798.5	-3.201	0.001
Observed student symptoms: forgetfulness, impulsivity	518.0	869.0	-2.501	0.012
Perceived method effectiveness	575.0	926.0	-2.187	0.029
Need for curriculum adaptation	574.0	925.0	-2.098	0.036
Confidence in managing ADHD-related challenges	577.0	928.0	-2.024	0.043

Of particular interest are the differences that emerge based on the challenges faced by teachers. Perceived lack of training, time and materials is associated with increased needs for support and interventions, as well as more pronounced observation of difficulties in students (see Table 4):

Table 4: Challenges and Their Impact on Educational Practices

Variable (grouped by "Lack of training and resources")	Mann- Whitney U	Wilcoxon W	Z	p- value
Frequency of educational material adjustments	457.0	688.0	-2.280	0.023
Declared a need for additional education and training	357.0	2373.0	-3.641	< .001
Observed symptom: losing essential items (e.g. books, notebooks)	477.5	708.5	-2.035	0.042

The data show that the training and strategies that teachers implement are closely linked to their attitudes, awareness and daily pedagogical practice. These variations reinforce the importance of systematic training, the provision of supportive tools and the enhancement of teachers' educational self-efficacy.

Correlation analyses (Spearman) provided significant findings. High self-perception of understanding ADHD was associated with more frequent adjustments to teaching materials, enhanced observation of behavioural signs and more positive evaluation of intervention effectiveness, confirming the view that theoretical knowledge translates into practical pedagogical action (Slavin, 2014; Tomlinson, 2014).

Furthermore, correlations showed that there was a strong positive association between frequency of adjustments and observation of symptoms (e.g. hyperactivity, cooperation difficulties). The more frequent the adaptations, the more frequent the observation of symptoms (hyperactivity, interruptions, cooperation difficulties).

Behavioural signs show strong correlations between them - e.g. loss of materials is associated with hyperactivity and difficulty concentrating. The findings confirm that knowledge around ADHD is not an abstract concept, but a practical support tool, which relates to teachers' daily observations and practices. The multivariate analysis of the correlations highlights that ADHD symptoms do not operate in isolation but as a matrix that affects the teaching and social dynamics of the classroom, pointing to the need for holistic management of student behaviour in the classroom. (Zentall, 2005). The use of experiential tools, such as storytelling and psychomotor expression, is indicated as a supportive strategy, especially in group learning environments (Johnson & Johnson, 1999; Sarris, 2021).

Hyperactivity Innatention **Total Score** Difficulty staying seated 0.291 0.33 0.332 Interrupting discussions 0.252 0.2440.306 0.238 0.225 0.316 Disorganization 0.297 0.464 Difficulty cooperating 0.45 0.386 0.443 0.35 **Impatience** Loss of items 0.448 0.294 0.443 1.0 0.419 0.396 Inattention 0.419 0.772 Hyperactivity 1.0 Toral ADHD score 0.396 0.772 1.00

Table 5: The Spearman Correlation Analyses

6. Discussion

This study highlighted the perceptions and practices of primary school teachers regarding the management and support of students with ADHD, shedding light on the challenges, adaptation needs and the level of training available to teachers. Data analysis revealed interesting dynamics and synergies between theoretical hypotheses and empirical results.

First, teachers' positive self-perceptions of their understanding of ADHD appear to be associated with an increased frequency of adaptations to instructional materials and greater attentiveness to behaviors associated with the disorder. This finding supports the theoretical position that pedagogical knowledge acts as an enabler for differentiating instruction (Sarris *et al.*, 2024). However, this association does not negate the need for more systematic and experiential training, as evidenced by the increased statement of need for specialized resources and collaboration with specialists.

Of particular importance is the strong presence of collaborative learning as an effective teaching practice, suggesting that teachers are looking for ways to enhance social interaction and empathy in the classroom. The observed positive attitudes of teachers towards this approach are consistent with the psychopedagogical view of learning (Slavin, 2014; Sarris *et al.*, 2024), which emphasises emotional safety and differentiated assessment.

The emergence of time constraints as a critical inhibiting factor supports previous research findings (Zentall, 2005; Sarris *et al.*, 2024), demonstrating the need for a structural rethink of how school settings operate. Lack of time is not just an organisational problem, but has a catalytic effect on the quality of the teacher-student relationship and on deepening understanding of ADHD.

The statistical correlation between perceived effectiveness of methods and behavioural observation supports the thesis that experiential interaction with children with ADHD strengthens the teacher's role. As understanding increases, so does sensitivity to observing subtle behavioural differences, confirming that knowledge is not just a cognitive tool, but is linked to the teacher's emotional vigilance (Sarris *et al.*, 2022).

It is worth noting that while teachers acknowledge the importance of working with experts and using tools, they still report limited access to them. This observation highlights the lack of institutional support and the absence of a coherent, inclusive model of intervention.

In conclusion, the findings of the study reinforce the need for comprehensive educational support policies, focused on both training and the provision of substantial resources, in order to make support for students with ADHD feasible, systematic and effective.

7. Conclusions

This study highlighted critical aspects of educational management of ADHD, shedding light on the attitudes, practices and training needs of primary school teachers. Through data analysis, it was found that understanding of ADHD is directly related to the frequency of implementation of supportive interventions, while the difficulties faced by teachers mainly relate to lack of time, insufficient training and the absence of specialized tools.

The application of cooperative learning and creative media, such as story and puppet, seems to enhance the teaching competence and emotional engagement of students with ADHD. At the same time, psychomotor approaches and individualized strategies are shown to be important in managing behaviour and developing social skills.

Teachers who are more confident in their understanding of ADHD demonstrate increased sensitivity to behavioural cues and a tendency to modify teaching materials, demonstrating that knowledge is a tool for action and prevention. Differences based on age and experience highlight the need for individualised training interventions and support for both new and experienced teachers.

Overall, the findings highlight an educational world that, despite challenges, demonstrates a willingness for change, reflection and pedagogical responsibility. Institutional recognition of teachers' efforts, the development of flexible curricula and the systematic integration of psycho-educational interventions can provide the basis for a truly inclusive education.

8. Future Proposals

Future research could turn to longitudinal studies, exploring how teachers' attitudes and practices are transformed through experience, training and institutional changes. Such an approach may reveal how ongoing interaction with students with ADHD gradually shapes the teacher's pedagogical identity and professional empowerment.

At the same time, it is proposed to incorporate mixed methodologies and to use tools from the psychodynamic approach in order to study more deeply the teachers' internal reactions and the impact of psychological empowerment on the effectiveness of the classroom as a dynamic unit.

In addition, it is crucial to broaden the focus to other actors in the school ecosystem, such as parents and peers of children with ADHD. Such a multi-level investigation could shed light on how ecosystem factors influence students' emotional well-being, self-esteem and social relationships.

Finally, studies that investigate not only academic performance but also the psychosocial impact of pedagogical interventions could contribute to the design of integrated psycho-educational programs (Sarris *et al.*, 2021; Sarris *et al.*, 2022) oriented towards inclusive progress and experiential support for children with ADHD.

Conflict of Interest Statement

The authors have no conflicts of interest to declare that are relevant to the content of this article.

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