



## TEACHERS' KNOWLEDGE OF ATTENTION DEFICIT HYPERACTIVITY DISORDER AND SELF-EFFICACY IN SUPPORTING STUDENTS WITH ADHD

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### Abstract:

The increasing prevalence of Attention Deficit Hyperactivity Disorder (ADHD) in school settings highlights the critical role of teachers in the early diagnosis and effective educational support of students with the disorder. Teachers' knowledge of ADHD is consistently linked to their teaching practices, attitudes, and perceived self-efficacy. However, empirical evidence in the international literature reveals significant knowledge gaps and limited professional readiness. The present study aimed to investigate Greek teachers' knowledge of ADHD, to examine their relationship with perceived self-efficacy in teaching to support students with ADHD, and to identify demographic and professional predictors for both concepts. The sample consisted of 151 primary and secondary school teachers. Data were collected using the Knowledge of Attention Deficit Disorders Scale (KADDS) and the Teachers' Sense of Efficacy Scale (TSES). Descriptive, correlational, and multiple regression analyses were performed. The findings showed that teachers demonstrated satisfactory knowledge of the symptoms and diagnostic characteristics of ADHD, but moderate to low levels of knowledge about general aspects and, in particular, treatment-related issues. Teachers' perceived self-efficacy was reported at moderate to high levels, with higher scores on teaching strategies than on student engagement and classroom management. Significant positive correlations were found between teachers' knowledge of ADHD, particularly knowledge of symptoms and diagnosis, and all dimensions of self-efficacy. Participation in ADHD training programs emerged as the strongest predictor of teachers' knowledge, while specialized studies in special education, teaching experience, and higher educational attainment were

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associated with increased self-efficacy. Knowledge of ADHD symptoms was identified as an important predictor of teachers' effectiveness in engaging students and managing the classroom. The findings underscore the need for a better understanding of the disorder on the part of teachers as a key component of inclusive education. Strengthening teachers' knowledge appears to be essential for enhancing self-efficacy and improving the quality of educational support provided to students with ADHD.

**Keywords:** attention-deficit/hyperactivity disorder (ADHD), teachers' knowledge of ADHD, self-efficacy

## 1. Introduction

Current estimates suggest that ADHD is prevalent throughout the educational context, and in recent decades, there has been a steady increase in the prevalence of the disorder worldwide (Faraone *et al.*, 2021; Roco *et al.*, 2021). It is now estimated that there is at least one child with this disorder in every classroom (Latouche & Gascoigne, 2019). Considering that the disorder is most often diagnosed during preschool and school age (Daley *et al.*, 2009; Sonuga-Barke *et al.*, 2013), the role of teachers is essential for the early diagnosis and management of ADHD in a classroom setting (DuPaul & Stoner, 2014; Sugai & Horner, 2020).

They are often the first to suspect the disorder, raise concerns, and usually request a referral for clinical evaluation, while also being the main source of information for parents (Hosseinnia *et al.*, 2020; Scitutto *et al.*, 2000; Shroff *et al.*, 2017). At the same time, a good understanding of the disorder on the part of teachers counteracts stereotypical and stigmatising perceptions and helps them to effectively support students with ADHD (Jarque Fernandez *et al.*, 2021; Martinuseen *et al.*, 2006). Despite the increasing prevalence of the disorder and the frequent presence of students with ADHD in the school environment, the educational community's understanding of it remains limited and fragmentary. Most research shows that teachers are inadequately prepared and lack the skills to support students with ADHD due to the limited or inadequate training they receive (Guerra *et al.*, 2017; Martinussen *et al.*, 2011; Scitutto *et al.*, 2000; Poznanski *et al.*, 2018).

Incomplete knowledge, persistent misconceptions, and inadequate scientific training of teachers regarding ADHD constitute critical obstacles to both the timely identification of the disorder and the effective educational support of students. The purpose of this study is to assess Greek teachers' level of understanding of ADHD and to investigate the relationship between their knowledge of the disorder and their perceived self-efficacy in supporting students with ADHD. The study also examined whether teachers' knowledge of the disorder can be a predictor of their self-efficacy in supporting students with ADHD. Finally, the study examined whether teachers' demographic and professional profiles influence their knowledge of ADHD and their perceived self-efficacy in supporting students with the disorder.

## 2. Literature Review

### 2.1 Attention-Deficit/Hyperactivity Disorder – ADHD

Attention-Deficit/Hyperactivity Disorder is characterized by a persistent, developmentally inappropriate pattern that includes inattention, attention deficit or distraction, impulsivity, and/or hyperactivity that affects the individual's ability to concentrate, organize their thoughts and actions, and control their impulses and behavior (Center for Disease Control and Prevention, 2020; Faraone *et al.*, 2021; National Institute of Mental Health, 2020). According to the DSM-V (APA, 2013), in order to confirm the diagnosis, the diagnostic criteria must be persistently present for at least six months and include either six out of the nine symptoms of inattention (at least five for individuals over 17 years of age) or a total of at least six symptoms from the hyperactivity and impulsivity categories (at least 5 for individuals over 17 years of age) in two or more settings (e.g., home, school).

ADHD can occur in any individual, regardless of ethnicity, racial group, or social status. It is considered a multifactorial neurobiological disorder as it is caused by both genetic factors (e.g., lack of oxygen during birth, brain injury, low birth weight, premature birth) and environmental factors (unfavourable family environment, dysfunctional family relationships, maternal smoking, alcohol, anxiety/stress during pregnancy) (Faraone & Larsson, 2019; Marusak *et al.*, 2022). Heredity also plays an important role in the onset of ADHD, as there is a two to eight times higher risk in children whose parents and/or siblings had symptoms of ADHD (Faraone & Larsson, 2019; Marusak *et al.*, 2022).

ADHD affects children in many ways, causing various difficulties at the academic, cognitive, behavioral, social, psychological, and emotional levels (APA, 2013; Blotnicky-Gallant *et al.*, 2015). It leads to a reduced ability to maintain interest in an activity, low task completion rates, significant difficulty in academic functioning, with below average performance and is associated with tendencies toward frustration and higher school dropout rates (Arnold *et al.*, 2020; DuPaul & Stoner, 2014; Guerra *et al.*, 2017; Mayes *et al.*, 2020; Poznanski *et al.*, 2018). ADHD is also associated with non-compliance with rules, strain on social relationships, rebellious tendencies in response to any imposition of discipline, oppositional defiant disorder, conflicts, and outbursts of anger in family and school environments (DuPaul & Stoner, 2014). Children with ADHD often have difficulty processing and regulating their emotions, which can affect social interaction and understanding of others' emotional responses (APA, 2013; Faraone *et al.*, 2019; Center for Disease Control and Prevention, 2021; Tamm *et al.*, 2021). The disorder is associated with deficits in emotional regulation, which are often accompanied by low self-esteem, negative self-perception, and limited social skills (Faraone *et al.*, 2019; Hodgkins *et al.*, 2013).

## 2.2 Teachers' Knowledge of Attention Deficit Hyperactivity Disorder

International literature consistently shows that, regardless of geographical, cultural, and educational context, teachers have a low to moderate level of knowledge about ADHD, which highlights the ongoing need for systematic reinforcement of their initial and continuing professional training (Al-Omari *et al.*, 2015; Al-Moghamsi & Aljohani, 2018; Anderson *et al.*, 2012; Blotnicky-Gallant *et al.*, 2015; Guerra *et al.*, 2017; Jimoh, 2014; Kos *et al.*, 2004; Perold, *et al.*, 2010; Sciutto *et al.*, 2000; Yoo *et al.*, 2009; Youssef *et al.*, 2015). Studies reporting higher levels of knowledge (Bekle, 2004; Ohan *et al.*, 2008; West *et al.*, 2005) are limited, and their findings appear to be influenced by factors such as the quality of training, previous experience with students with ADHD, and differences in research tools, which limit the comparability of the results.

The inadequate training of teachers in ADHD is associated with reduced readiness to detect the disorder early and implement effective interventions in the school setting (Guerra *et al.*, 2017; Latouche & Gascoigne, 2019; Martinussen *et al.*, 2011; Poznanski *et al.*, 2018; Sciutto *et al.*, 2000). At the same time, limited knowledge and persistent misconceptions act as barriers to providing meaningful support to students, and are associated with low teaching self-efficacy, difficulties in classroom management, increased professional stress and burnout, as well as more negative attitudes towards students with ADHD (Bradshaw & Kamal, 2013; Guerra & Brown, 2012; Reinke *et al.*, 2011; Poznanski *et al.*, 2018; Sciutto *et al.*, 2016; Stavvaka & Kaprinis, 2025).

Empirical data from the US show that teachers have, on average, a moderate level of general knowledge about the disorder, with a clearly better understanding of the symptoms of ADHD compared to knowledge about treatment and educational interventions (Guerra *et al.*, 2017; Poznanski *et al.*, 2018; Sciutto *et al.*, 2000). Overall, research data converge on the need to strengthen the education of prospective teachers at the undergraduate level, as well as to implement regular, structured professional development programs for practicing teachers (Latouche & Gascoigne, 2019; Martinussen *et al.*, 2011). For example, research by Guerra *et al.* (2017) in the US found that teacher candidates do not receive specialized training on the disorder during their academic studies. As a result, teachers appear to be inadequately prepared both for the timely referral of students for assessment and for the implementation of appropriate educational interventions. Similar findings have been reported in Canada (Blotnicky-Gallant *et al.*, 2015), Australia (Kos *et al.*, 2004), and South Africa (Perold *et al.*, 2010). In particular, the study by Kos *et al.* (2004) showed that teachers with teaching experience in instructing students with ADHD had a higher level of knowledge and a deeper understanding of the disorder compared to their colleagues without such experience.

Similarly, low levels of knowledge, particularly in the field of therapeutic and educational intervention, are systematically recorded in Middle Eastern countries, which suggests that the inadequate training of teachers in ADHD is a structural rather than a local problem. In particular, the level of knowledge of teachers in Saudi Arabia was only 38% (Al-Moghamsi & Aljohani, 2018). Alkahtani's (2013) research found that Saudi Arabian teachers' knowledge of the disorder was extremely limited (17.2%), while a

significant percentage of teachers (59.8%) reported ignorance of basic facts about ADHD. Similarly, in the study by Saad *et al.* (2022), teachers in the United Arab Emirates had sufficient knowledge to recognize the symptoms and diagnose the disorder (56.3%) but had low knowledge of how to treat it (34.1%). Alshammari (2020), investigating the level of knowledge of School Education Advisors in Saudi Arabia, found a particularly low level of knowledge even among senior administrators, as only 31% of participants demonstrated a good understanding of the disorder. The findings reflect a problematic situation that essentially undermines any effort to effectively support teachers.

A common finding across studies is the strong correlation between teaching experience with students with ADHD and increased knowledge about the disorder (Anderson *et al.*, 2012; Liang & Gao, 2016). Moreover, furthering education, even through short-term professional development programs, has been shown to be effective in improving teachers' knowledge, teaching self-efficacy, and attitudes. In particular, Latouche and Gascoigne (2019), investigating the effect of a monthly training program on ADHD, found that even short-term programs contribute significantly to increasing knowledge and strengthening the ability to manage and support students with ADHDs in the classroom. Finally, a multitude of studies support the view that increased knowledge about ADHD helps to reduce teachers' negative beliefs, promotes acceptance, and shapes positive and supportive attitudes towards the inclusion of students with ADHD (Anderson *et al.*, 2012; Hosseinnia *et al.*, 2020; Latouche & Gascoigne, 2019; Ohan *et al.*, 2008).

In summary, research data converge on the need to upgrade the initial training of prospective teachers and to implement systematic, structured training programs for active teachers, with the aim of not only strengthening their knowledge but also improving their teaching self-efficacy and inclusive attitudes towards students with ADHD (Greenberg *et al.*, 2013; Latouche & Gascoigne, 2019; Martinussen *et al.*, 2011; O'Neil & Stephenson, 2011).

### **2.3 Teachers' self-efficacy in supporting students with ADHD**

Teachers' self-efficacy is defined as their set of beliefs about their ability to organize and implement effective teaching and management practices for the purpose of student learning (Tschannen-Moran & Hoy, 2001). Critical dimensions include classroom management, the implementation of appropriate teaching strategies, and the active engagement of students in the learning process (Tschannen-Moran & Hoy, 2001).

High levels of teacher self-efficacy are associated with increased perseverance, adapted teaching practices, a positive classroom climate, reduced levels of stress and professional burnout, factors that are considered crucial for the effective inclusion of students with ADHD (Curtis *et al.*, 2014; Klassen & Tze, 2014; Katsora *et al.*, 2022). Lack of adequate training and preparedness is associated with reduced teaching effectiveness (DuPaul & Stoner, 2014; Owens *et al.*, 2017), as teachers are unable to support students with diverse educational needs. Teachers with high perceived self-efficacy believe in the ability of all students to learn, are more organized, demonstrate perseverance, develop

adapted teaching strategies, and experience increased job satisfaction and reduced levels of stress and professional burnout (Curtis *et al.*, 2014; Gkouvousi *et al.*, 2024; Katsora *et al.*, 2022; Koutsovasili *et al.*, 2024; Klassen & Tze, 2014; Ryan *et al.*, 2015; Stavraka & Kaprinis, 2025).

Conversely, low levels of self-efficacy are associated with doubts about the teacher's impact on student learning progress, reduced effort, and increased emotional exhaustion, especially in inclusive education settings (Dicke *et al.*, 2014; Shillingford & Karlin, 2014; Stavraka & Kaprinis, 2025). In the context of ADHD education, teachers' self-efficacy is influenced by both student characteristics and their knowledge and professional experience. Vlah *et al.* (2021) found that although teachers reported competence in classroom management, they reported low effectiveness in activating student participation, which highlights the need for targeted training in ADHD. Frohlich *et al.* (2020) argued that attributions of causes of student difficulties play a decisive role, as an emphasis on uncontrollable factors (e.g., genetics) is associated with low expectations and reduced student engagement, while attributing them to controllable factors (teaching support, differentiated instruction, classroom environment) enhances feelings of efficacy and motivation to succeed.

The literature demonstrates a consistent positive correlation between knowledge of ADHD, perceived self-efficacy, and supportive teaching behavior (Alkahtani, 2013; Gkouvousi *et al.*, 2024; Poznanski *et al.*, 2018; Scitutto *et al.*, 2000). Teachers with adequate knowledge of the disorder feel more capable of responding to inclusive settings and implementing effective interventions (Guerra & Brown, 2012; Montgomery & Miranda, 2014). Training intervention programs, even short-term ones, have been shown to be effective in improving both teachers' knowledge and self-efficacy (Chao *et al.*, 2017; Jarque Fernandez *et al.*, 2021; Lasisi *et al.*, 2017; Latouche & Gascoigne, 2019; Poznanski *et al.*, 2021; Strelow *et al.*, 2021). However, some studies highlight weak or statistically insignificant correlations between knowledge and the application of effective practices, suggesting that knowledge, although necessary, is not sufficient on its own without the reinforcement of attitudes, beliefs, emotional intelligence, and social justice orientation of teachers (Andritsou *et al.*, 2025; Blotnick-Gallant *et al.*, 2015; Koutsovasili & Kaprinis, 2025; Poznanski *et al.*, 2018; Voulgaraki *et al.*, 2023). Therefore, the training of teachers in ADHD should be approached as a multidimensional process that combines scientific knowledge, enhancing self-efficacy, and transforming pedagogical beliefs in order to effectively support the inclusion of students with the disorder.

### 3. Material and Methods

#### 3.1 Sample

The survey involved 151 primary and secondary school teachers, with the aim of investigating their knowledge of ADHD and their self-efficacy in supporting students with this disorder. 76.16% (n=115) of participants were women and 23.84% (n=36) were men. Regarding the age of teachers, 35.1% (n=53) were 51 years old and above, 30.46%

(n=46) belonged to the 41–50 age group, 27.15% (n=41) to the 31–40 age group, and 7.28% (n=11) to the 22–30 age group. In terms of education, 53.64% (n=81) of teachers held a master's degree, 39.74% (n=60) were university graduates, and 6.62% (n=10) held a PhD. In terms of professional experience, 35.1% (n=53) had 21 years or more, 29.8% (n=45) had 11–20 years, 20.53% (n=31) had 0–5 years, and 14.57% (n=22) had 6–10 years. 64.9% (n=98) of the teachers worked in secondary education, while 35.1% (n=53) worked in primary education. In addition, 55.63% (n=84) had attended a seminar or training program in ADHD, while 44.35% (n=67) had not received relevant training. With regard to specialized studies in special education, 70.86% (n=107) stated that they did not have the relevant academic background, while 29.14% (n=44) reported that they had studied the subject. Finally, 70.86% (n=107) of teachers had previous experience teaching students with ADHD, while 29.14% (n=44) had no relevant experience.

### 3.2 Research Tools

For the purposes of the study, the Knowledge of Attention Deficit Disorders Scale – KADDS questionnaire (Sciutto *et al.*, 2000) was used, which assesses three factors: (i) general information about ADHD, (ii) knowledge about symptoms/diagnosis, and (iii) knowledge about treatment. The questionnaire showed high overall reliability ( $\alpha = 0.84$ ). Reliability was satisfactory for the factor "knowledge about treatment" ( $\alpha = 0.71$ ), while it was considered acceptable for the factors "general information about ADHD" ( $\alpha = 0.67$ ) and "knowledge about symptoms/diagnosis of ADHD" ( $\alpha = 0.61$ ) (Taber, 2018). The three-way categorization of responses into "correct – incorrect – don't know" allows for a more accurate assessment of teachers' knowledge level, as correct answers indicate sufficient knowledge, incorrect answers indicate incorrect knowledge or misconceptions, while the "don't know" option indicates a lack of knowledge. The distinction between misunderstanding and ignorance is particularly important, given that misconceptions about ADHD are often more persistent than gaps in knowledge. In addition, the Teachers' Sense of Efficacy Scale (TSES) questionnaire (Tschannen-Moran & Hoy, 2001) was used, which assesses teachers' perceived teaching self-efficacy. In this study, the short version of 12 questions was used. The responses are categorized into three (3) factors: (i) efficacy of instructional strategies, (ii) efficacy for classroom management, and (iii) efficacy for student engagement. The TSES scale showed high overall reliability ( $\alpha=0.87$ ), satisfactory reliability for the factor "efficacy for classroom management" ( $\alpha=0.81$ ), and acceptable reliability for the factors "efficacy instructional strategies" ( $\alpha=0.74$ ) and "efficacy for student engagement" ( $\alpha=0.69$ ) (Taber, 2018).

## 4. Results and Discussion

### 4.1 Teachers' understanding of ADHD

Table 1 shows the five most common correct answers given by participants to the general knowledge questions.

**Table 1:** The five most common correct answers given by teachers regarding ADHD

Question	Sub-scale KADDS	Correct Answer	N Correct	% Correct
26. ADHD children often have difficulties organizing tasks and activities.	Symptoms	True	140	92.72
3. ADHD children are frequently distracted by extraneous stimuli.	Symptoms	True	135	89.40
13. It is possible for an adult to be diagnosed with ADHD.	General Knowledge	True	117	77.48
32. The majority of ADHD children evidence some degree of poor school performance in the elementary school years	General Knowledge	True	114	75.50
16. Current wisdom about ADHD suggests two clusters of symptoms: One of inattention and another consisting of hyperactivity/impulsivity.	Symptoms	True	106	70.20

Table 2 shows the five most common incorrect answers given by teachers regarding ADHD.

**Table 2:** The five most common incorrect answers given by teachers regarding ADHD

Question	Sub-scale KADDS	Correct Answer	N Correct	% Correct
36. Treatments for ADHD which focus primarily on punishment have been found to be the most effective in reducing the symptoms of ADHD.	Treatment	False	119	78.81
22. If an ADHD child is able to demonstrate sustained attention to video games or TV for over an hour, that child is also able to sustain attention for at least an hour of class or homework,	General Knowledge	False	114	75.50
7. One symptom of ADHD children is that they have been physically cruel to other people.	Symptoms	False	103	68.21
11. It is common for ADHD children to have an inflated sense of self-esteem or grandiosity.	Symptoms	False	97	64.24
2. Current research suggests that ADHD is largely the result of ineffective parenting skills.	Treatment	False	87	57.62

Table 3 shows the five most common "I don't know" answers given by teachers regarding ADHD.

**Table 3:** The five most common "I don't know" answers given by teachers regarding ADHD

Question	Sub-scale KADDS	Correct Answer	N Correct	% Correct
15. Side effects of stimulant drugs used for treatment of ADHD may include mild insomnia and appetite reduction.	Treatment	True	103	68.21
35. Electroconvulsive Therapy (i.e. shock treatment) has been found to be an effective treatment for severe cases of ADHD.	Treatment	False	93	61.59
25. Stimulant drugs are the most common type of drug used to treat children with ADHD.	Treatment	True	92	60.93
8. Antidepressant drugs have been effective in reducing symptoms for many ADHD children.	Treatment	True	89	58.94
1. Most estimates suggest that ADHD occurs in approximately 15% of school age children.	General Knowledge	False	84	55.63

#### 4.2 Mean (M) and Standard Deviations (SD) factors of Knowledge of KADDS and TSES

In the KADDS questionnaire, based on the possible range of values (0-100), the factor "Knowledge about Symptoms/diagnosis ADHD" was rated highly ( $M=65.34$ ,  $S.D=21.54$ ), moderately rated "General information about ADHD" ( $M=42.91$ ,  $S.D=17.98$ ) and moderately to low rated "Knowledge about Treatment ADHD" ( $M=36.04$ ,  $S.D=21.68$ ). In the TSES questionnaire, based on the possible range of values (from 1 to 5), high levels were observed in "Efficacy instructional strategies" ( $M=3.81$ ,  $S.D=0.54$ ) and moderate to high levels in the factors "Efficacy for student engagement" ( $M=3.48$ ,  $S.D=0.51$ ) and "Efficacy for classroom management" ( $M=3.41$ ,  $S.D=0.57$ ) (Table 4).

**Table 4:** Mean (M), Standard Deviation (SD) and 95% C.I Factors of KADDS and TSES

Factors	M	S.D	95% C.I
General information about ADHD	42.91	17.98	[40.02, 45.85]
Knowledge about symptoms/diagnosis of ADHD	65.34	21.54	[61.88, 68.81]
Knowledge about the treatment of ADHD	36.04	21.68	[32.55, 39.52]
Efficacy for student engagement	3.48	0.51	[3.39, 3.56]
Efficacy of instructional strategies	3.81	0.54	[3.72, 3.89]
Efficacy for classroom management	3.41	0.57	[3.32, 3.50]

#### 4.3 Teachers' sense efficacy in supporting students with ADHD

Table 5 presents the results regarding teachers' self-efficacy in supporting students with ADHD. It appears that, on average, teachers are largely able to make students believe that they can do well in schoolwork ( $M=3.72$ ,  $S.D=0.64$ ). In addition, to some or a large extent, they manage to help their students appreciate the value of learning ( $M=3.49$ ,  $S.D=0.66$ ). Furthermore, to some extent, they can motivate students who show reduced interest ( $M=3.38$ ,  $S.D=0.69$ ) and help families so that they, in turn, can offer help to their children to do well in school ( $M=3.32$ ,  $S.D=0.83$ ). With regard to the effectiveness of teaching strategies, teachers largely apply the strategy of giving an alternative

explanation or example when students have difficulty understanding something they have taught ( $M=4.07, S.D=0.63$ ), asking relevant and understandable questions during the lesson ( $M=3.97, S.D=0.63$ ), and applying alternative teaching methods in their classroom ( $M=3.61, S.D=0.83$ ). They can also use various methods to assess their students' performance to a certain or large extent ( $M=3.59, S.D=0.78$ ). Regarding classroom management, on average, teachers responded that to some extent they are able to get students to comply with classroom rules ( $M=3.54, S.D=0.69$ ). In addition, to some extent, they can calm a student who is disruptive and noisy ( $M=3.39, S.D=0.68$ ), control behaviors that disrupt class cohesion ( $M=3.39, S.D=0.72$ ), and establish a classroom management system ( $M=3.30, S.D=0.75$ ).

**Table 5:** Mean (M), Standard Deviation (SD) of Factors of the Teachers' Sense of Efficacy Scale – TSES

Question	Range	M	S.D
<b>Factor Efficacy for Student Engagement</b>			
3. How much can you do to get students to believe they can do well in schoolwork?	2-5	3.72	0.64
4. How much can you do to help your students' value learning?	1-5	3.49	0.66
2. How much can you do to motivate students who show low interest in schoolwork?	2-5	3.38	0.69
11. How much can you assist families in helping their children do well in school?	1-5	3.32	0.83
<b>Factor Efficacy Instructional Strategies</b>			
10. To what extent can you provide an alternative explanation or example when students are confused?	2-5	4.07	0.63
5. To what extent can you craft good questions for your students?	2-5	3.97	0.63
12. How well can you implement alternative strategies in your classroom?	1-5	3.61	0.83
9. How much can you use a variety of assessment strategies?	1-5	3.59	0.78
<b>Factor Efficacy for Classroom Management</b>			
6. How much can you do to get children to follow classroom rules?	1-5	3.54	0.69
7. How much can you do to calm a student who is disruptive or noisy?	2-5	3.39	0.68
1. How much can you do to control disruptive behavior in the classroom?	1-5	3.39	0.72
8. How well can you establish a classroom management system with each group of students?	1-5	3.30	0.75

#### 4.4 Correlation KADDS factors with TSES factors (Spearman's Rho)

Table 6 presents the results of Spearman's rho correlations between the factors of the KADDS questionnaire and the TSES scale in supporting students with ADHD. The results of the analyses showed that "Efficacy for student engagement" was positively correlated with "General knowledge about ADHD" ( $\rho (151) = 0.175, p < 0.05$ ), "Knowledge about symptoms/diagnosis of ADHD" ( $\rho (151) = 0.316, p < 0.01$ ), and "Knowledge about treatment of ADHD" ( $\rho (151) = 0.181, p < 0.05$ ). "Efficacy instructional strategies" was positively correlated with "General knowledge about ADHD" ( $\rho (151) = 0.226, p < 0.01$ ), "Knowledge about symptoms/diagnosis of ADHD" ( $\rho (151) = 0.228, p < 0.01$ ) and "Knowledge about treatment of ADHD" ( $\rho (151) = 0.205, p < 0.05$ ). "Efficacy

for classroom management" was positively correlated with "General information about ADHD" ( $\rho=0.202, p<0.05$ ).

**Table 6:** Spearman correlation between factors KADDS and TSES

Factors	General knowledge about ADHD	Knowledge about symptoms/diagnosis of ADHD	Knowledge about treatment of ADHD
Efficacy for student engagement	.175*	.316**	.181*
Efficacy instructional strategies	.226**	.228**	.205*
Efficacy for classroom management	0.136	.202*	0.137

\*\* $p<0.01$ , \* $p<0.05$

#### 4.5 Correlation of KADDS Factors with Demographic Characteristics and Professional-related Variables

With regard to gender, statistically significant differences in mean scores were observed for the factor "knowledge about symptoms/diagnosis of ADHD", with higher scores recorded for women compared to men ( $M_{women}=67.05$  vs  $M_{men}=59.88, Z=-2.114, p=0.035$ ). Regarding educational level, statistically significant differences in mean scores were observed in the factor "Knowledge about treatment of ADHD" ( $H(2.151) = 12.134, p=0.002$ ). The mean of teachers with a bachelor's degree ( $M=29.58$ ) is statistically lower than the mean of those with a master's degree ( $M=38.07, p=0.002$ ) or a PhD degree ( $M=58.33, p=0.002$ ). Furthermore, according to the post hoc Bonferroni test, the average age of teachers with a master's degree is statistically lower than that of those with a PhD ( $M_{master}=38.07$  vs  $M_{PhD}=58.33, p=0.0039$ ). In terms of teaching experience, statistically significantly higher values were observed in teachers with up to 10 years of experience in the factors "General knowledge about ADHD" ( $M_{0-10\ years}=46.67$  vs  $M_{11+\ years}=40.88, Z=-2.020, p=0.043$ ), "Knowledge about symptoms/diagnosis of ADHD" ( $M_{0-10\ years}=70.44$  vs  $M_{11+\ years}=62.59, Z=-2.156, p=0.031$ ) and "Knowledge about treatment of ADHD" ( $M_{0-10\ years}=44.03$  vs  $M_{11+\ years}=31.72, Z=-3.508, p<0,001$ ). In terms of stage of education, statistically significantly higher scores were observed for primary school teachers in the factors "General knowledge about ADHD" ( $M_{primary}=48.55$  vs  $M_{secondary}=39.86, Z=-2.541, p=0.011$ ) and "Knowledge about symptoms/diagnosis of ADHD" ( $M_{primary}=70.86$  vs  $M_{secondary}=62.36, Z=-2.601, p=0.009$ ). With regard to additional training in ADHD, statistically significant differences were observed in teachers who had received training compared to their colleagues who had not received relevant training in the factors "General knowledge about ADHD" ( $M_{training\ in\ ADHD}=49.37$  vs  $M_{without\ training\ in\ ADHD}=34.83, Z=-5.072, p<0.001$ ), "Knowledge about symptoms/diagnosis of ADHD" ( $M_{training\ in\ ADHD}=72.62$  vs  $M_{without\ training\ in\ ADHD}=56.22, Z=-4.580, p<0.001$ ) and "Knowledge about treatment of ADHD" ( $M_{training\ in\ ADHD}$

seminar=45.54 vs  $M$  without training in ADHD=24.13,  $Z=-5.980$ ,  $p<0.001$ ). With regard to specialized studies in Special Education, statistically significant differences in means were found for teachers who had completed specialized studies in the factors "General knowledge about ADHD" ( $M$  Studies in SPED=49.55 vs  $M$  without studies in SPED=40.19,  $Z=-2.980$ ,  $p=0.003$ ), "Knowledge about symptoms/diagnosis of ADHD" ( $M$  Studies in SPED=75.51 vs  $M$  without studies in SPED=61.16,  $Z=-3.883$ ,  $p<0.001$ ) and "Knowledge about treatment of ADHD" ( $M$  studies in SPED=48.30 vs  $M$  without studies in SPED=31.00,  $Z=-4.496$ ,  $p<0.001$ ). With regard to previous teaching experience students with ADHD, statistically significantly higher values were observed in those with previous experience in the factors "General knowledge about ADHD" ( $M$  with teaching experience=45.30 vs  $M$  without teaching experience=37.12,  $Z=-2.867$ ,  $p=0.004$ ), "Knowledge about symptoms/diagnosis of ADHD" ( $M$  with teaching experience=68.74 vs  $M$  without teaching experience=57.07,  $Z=-2.878$ ,  $p=0.004$ ) and Knowledge about treatment of ADHD ( $M$  with teaching experience=38.16 vs  $M$  without teaching experience=30.87,  $Z=-1.993$ ,  $p=0.046$ ).

#### 4.6 Correlation of TSES Factors with Demographic Characteristics and Professional-related Variables

With regard to age, higher scores were observed in teachers over 40 years of age. The average score of teachers over 40 years of age is statistically higher than that of teachers aged 22-40 years in "Efficacy instructional strategies" ( $M_{41+years}=3.88$  vs  $M_{22-40 years}=3.67$ ,  $Z=-2.346$ ,  $p=0.019$ ) and in "Efficacy for classroom management" ( $M_{41+years}=3.50$  vs  $M_{22-40 years}=3.23$ ,  $Z=-2.697$ ,  $p=0.007$ ). In the factor "Efficacy instructional strategies," statistically significant differences emerged in terms of educational level ( $H(2.151) = 12.720$ ,  $p=0.002$ ). The average score of teachers who have a PhD ( $M=4.35$ ) is statistically higher than the average score of teachers with a master's degree ( $M=3.81$ ,  $p=0.004$ ) or a bachelor degree ( $M=3.71$ ,  $p<0.001$ ). With regard to teaching experience, statistically significant differences in mean values were observed in the factor "Efficacy for classroom management", with higher values recorded for teachers with more than 11 years of service compared to those who have been teaching for up to 10 years ( $M_{0-10 years}=3.28$  vs  $M_{O.11+years}=3.48$ ,  $Z=3.477$ ,  $p=0.030$ ). In terms of stage of education, statistically significant differences in mean scores were observed in the factor "Efficacy for student engagement" factor, with higher values recorded for teachers teaching in primary education compared to those teaching in secondary education ( $M_{primary}=3.62$  vs  $M_{secondary}=3.40$ ,  $Z=-2.721$ ,  $p=0.007$ ). With regard to additional training in ADHD, statistically significant differences in mean scores were observed in the factor "Efficacy for student engagement". Specifically, the mean of teachers who had training ( $M=3.57$ ) is statistically greater than that of teachers who did not ( $M=3.35$ ,  $Z=-2.629$ ,  $p=0.009$ ). With regard to specialized studies in special education, statistically significant differences in means were found in the factors "Efficacy for student engagement" ( $M$  Studies in SPED=3.65 vs  $M$  without studies in SPED=3.40,  $Z=-2.901$ ,  $p=0.004$ ) and "Efficacy instructional strategies" ( $M$  Studies in SPED=3.98 vs  $M$  without studies in SPED=3.74,  $Z=-2.461$ ,  $p=0.014$ ).

#### 4.7 Identification of predictive factors for KADDS

Multiple linear regression models were used to investigate the predictive factors of the KADDS scale. The independent variables included individual demographic characteristics that had emerged as statistically significant in the bivariate analysis. As shown in Table 7, the predictive factors for "general knowledge about ADHD" were "stage of education" ( $\beta=-0.161$ ,  $t=-2.144$ ,  $p=0.034$ , 18% effect) and "training program in ADHD" ( $\beta=0.327$ ,  $t=3.881$ ,  $p<0.001$ , 82% effect). In the sub-factor "Knowledge about symptoms/diagnosis of ADHD," the only predictive factor was "training program in ADHD" ( $\beta=0.257$ ,  $t=3.029$ ,  $p=0.003$ , 100% effect). Furthermore, in the factor "Knowledge about Treatment ADHD", the predictive factors were "Educational level" ( $\beta=0.183$ ,  $t=2.520$ ,  $p=0.013$ , 26% effect), and "training program in ADHD" ( $\beta=0.366$ ,  $t=4.662$ ,  $p<0.001$ , 74% effect).

**Table 7: Finding predictive factors for the KADDS scale about ADHD**

<b>Subscale General Knowledge about ADHD</b>					
<b>Independent Variables</b>	<b>B</b>	<b>Beta</b>	<b>t</b>	<b>p-value</b>	<b>VIF</b>
Constant	43.989	-	5.521	<0.001	-
Teaching experience	-0.742	-0.020	-0.246	0.806	1.180
Stage of education (primary/secondary)	-6.062	-0.161	-2.144	<b>0.034</b>	1.037
Training program in ADHD	11.778	0.327	3.881	<0.001	1.294
Specialized studies in special education	2.202	0.056	0.665	0.507	1.290
Experience teaching students with ADHD	4.165	0.106	1.373	0.172	1.082
(F(5.145)=7.577, p<0.001, R <sup>2</sup> =20.7%)					
<b>Subscale Knowledge about symptoms/diagnosis of ADHD</b>					
<b>Independent Variables</b>	<b>B</b>	<b>Beta</b>	<b>t</b>	<b>p-value</b>	<b>VIF</b>
Constant	57.657	-	4.763	<0.001	-
Gender	2.800	0.056	0.721	0.472	1.080
Teaching experience	-1.332	-0.030	-0.367	0.714	1.185
Stage of education (primary/secondary)	-4.728	-0.105	-1.381	0.169	1.054
Training program in ADHD	11.109	0.257	3.029	<b>0.003</b>	1.310
Specialized studies in special education	6.935	0.147	1.735	0.085	1.302
Experience teaching students with ADHD	6.413	0.136	1.735	0.085	1.113
(F(6.144)=6.325, p<0.001, R <sup>2</sup> =20.9%)					
<b>Subscale Knowledge about Treatment ADHD</b>					
<b>Independent Variables</b>	<b>B</b>	<b>Beta</b>	<b>t</b>	<b>p-value</b>	<b>VIF</b>
Constant	17.657	-	2.106	<b>0.037</b>	-
Educational level	6.660	0.183	2.520	<b>0.013</b>	1.118
Teaching experience	-2.998	-0.066	-0.880	0.381	1.197
Training program in ADHD	15.897	0.366	4.662	<0.001	1.298
Specialized studies in special education	6.694	0.141	1.780	0.077	1.321
Experience teaching students with ADHD	1.997	0.042	0.585	0.559	1.087
(F(5.145)=13.227, p<0.001, R <sup>2</sup> =31.3%)					

#### 4.8 Finding predictive factors for TSES

Multiple linear regression models were used to investigate the predictive factors of the TSES scale. The factors of the KADDS scale and the individual demographic data that

had emerged as statistically significant in the bivariate analysis were used as independent variables. As shown in Table 8, the only predictive factor for "Efficacy for student engagement" was "Knowledge about symptoms/diagnosis of ADHD" ( $\beta=0.266, t=2.634, p=0.009, 100\%$  effect). Predictive factors of "Efficacy instructional strategies" were age ( $\beta=0.235, t=2.995, p=0.003, 28\%$  effect), PhD ( $\beta=0.210, t=2.642, p=0.009, 36\%$  effect), and specialized studies in special education ( $\beta=0.199, t=2.380, p=0.019, 36\%$  effect). Finally, the only predictive factor for "Efficacy for classroom management" was knowledge about symptoms/diagnosis ADHD ( $\beta=0.248, t=3.133, p=0.002, 100\%$  effect).

**Table 8:** Predictive factors for TSES

<b>Subscale Efficacy for student engagement</b>					
<b>Independent Variables</b>	<b>B</b>	<b>Beta</b>	<b>t</b>	<b>p-value</b>	<b>VIF</b>
Constant	3.275	-	15.342	<0.001	-
Βαθμίδα εκπαίδευσης	-0.155	-0.144	-1.806	0.073	1.085
Training program in ADHD	0.052	0.050	0.542	0.588	1.465
Specialized studies in special education	0.117	0.104	1.205	0.230	1.268
General knowledge about ADHD	-0.001	-0.026	-0.241	0.810	2.016
Knowledge about symptoms/diagnosis of ADHD	0.006	0.266	2.634	<b>0.009</b>	1.728
Knowledge about Treatment ADHD	0.000	0.013	0.121	0.904	2.036
(F(6.144) = 4.266, p=0.001, R <sup>2</sup> =15.1%)					
<b>Subscale Efficacy instructional strategies</b>					
<b>Independent Variables</b>	<b>B</b>	<b>Beta</b>	<b>t</b>	<b>p-value</b>	<b>VIF</b>
Constant	2.987	-	14.767	<0.001	-
Age	0.267	0.235	2.995	<b>0.003</b>	1.095
PhD	0.455	0.210	2.642	<b>0.009</b>	1.117
Specialized studies in special education	0.237	0.199	2.380	<b>0.019</b>	1.242
General knowledge about ADHD	0.003	0.096	0.915	0.362	1.960
Knowledge about symptoms/diagnosis of ADHD	0.002	0.078	0.784	0.434	1.743
Knowledge about Treatment ADHD	0.001	0.031	0.290	0.772	1.991
(F (6.144) = 5.535, p<0.001, R <sup>2</sup> =18.7%)					
<b>Subscale Efficacy for classroom management</b>					
<b>Independent Variables</b>	<b>B</b>	<b>Beta</b>	<b>t</b>	<b>p-value</b>	<b>VIF</b>
Constant	2.409	-	10.122	<0.001	-
Age	0.208	0.174	1.871	0.063	1.439
Teaching experience	0.137	0.115	1.216	0.226	1.484
Knowledge about symptoms/diagnosis of ADHD	0.007	0.248	3.133	<b>0.002</b>	1.040
(F(3.147) = 6.365, p<0.001, R <sup>2</sup> =11.5%)					

## 5. Discussion and Conclusions

The findings of this study paint a multidimensional picture of Greek teachers' level of knowledge about ADHD. In particular, teachers seem to have an adequate and generally satisfactory understanding of the symptoms of the disorder, its diagnostic criteria, and

its basic subtypes. Similar findings have been reported in studies conducted in different educational and cultural contexts (Anderson *et al.*, 2021; Kos *et al.*, 2004; Liang & Gao., 2016; Perold *et al.*, 2010; Poznanski *et al.*, 2018; Saad *et al.*, 2022; Sciutto *et al.*, 2000), according to which the majority of teachers demonstrate satisfactory knowledge of the diagnosis and basic symptoms of ADHD. However, the level of general knowledge of Greek teachers regarding ADHD is assessed as moderate, as significant knowledge gaps are identified in critical aspects of the disorder. Specifically, there is limited understanding in areas such as the etiology, epidemiology, comorbidity, and early manifestations of ADHD, as well as misconceptions regarding the diagnostic process and behavioral adjustment of children. These findings are consistent with the results of previous studies (Aljohani, 2018; Anderson *et al.*, 2011; Kos *et al.*, 2004; Perold *et al.*, 2010; Poznanski *et al.*, 2018; Sciutto *et al.*, 2000; Topkin & Roman, 2015), which also highlight a moderate level of general knowledge among teachers about ADHD. Greek teachers' knowledge of the therapeutic treatment of ADHD appears to be particularly limited. The data indicate an inadequate understanding of the role of pharmacotherapy, the indications and possible side effects of stimulant medications, and the importance of combined pharmacological and psychoeducational interventions. This finding is confirmed by a wealth of related research (Akram *et al.*, 2009; Anderson *et al.*, 2021; Blotnick-Gallant *et al.*, 2015; Guerra *et al.*, 2017; Kos *et al.*, 2004; Liang & Gao, 2016; Perold *et al.*, 2010; Poznanski *et al.*, 2018; Saad *et al.*, 2022; Sciutto *et al.*, 2000), which highlights similar gaps in teachers' knowledge about the therapeutic management of the disorder. Overall, the findings underscore the need for more systematic and scientifically grounded training of teachers, both in the context of their initial training and their continuing professional development (Greenberg *et al.*, 2013; Latouche & Gascoigne, 2019; Martinussen *et al.*, 2011; O'Neil & Stephenson, 2011).

Furthermore, this study revealed a strong positive correlation between the level of understanding of ADHD and specialized studies in special education, as well as the updating of knowledge through training programs and seminars. The results are consistent with related research data (Aljohani, 2018; Alkahtani, 2013; Greenberg *et al.*, 2013; Latouche & Gascoigne, 2019; Martinussen *et al.*, 2011; O'Neil & Stephenson, 2011; Porter *et al.*, 2024; Poznanski *et al.*, 2018; Sciutto *et al.*, 2004; Sciutto & Terjesen, 2004). At the same time, a strong positive correlation was found between a good understanding of the disorder and prior teaching experience with students with ADHD. Teachers with relevant experience consistently demonstrate higher levels of knowledge and fewer misconceptions compared to those who have not taught students with the disorder, a finding that confirms the conclusions of the relevant literature (Alkahtani, 2013; Anderson *et al.*, 2012; Bekle, 2004; Kos *et al.*, 2004; Latouche & Gascoigne, 2019; Saad *et al.*, 2022; Sciutto *et al.*, 2000; Sciutto *et al.*, 2016; Youssef *et al.*, 2015). Furthermore, this study recorded a higher level of understanding of ADHD among teachers with higher educational attainment, a finding consistent with previous studies (Aljohani, 2018; Hosseinnia *et al.*, 2020). At the same time, primary school teachers showed higher levels of general knowledge about ADHD compared to secondary school teachers. Similarly,

the study by See *et al.* (2021) showed that primary school teachers have more extensive knowledge of the disorder, which is attributed to their more frequent interaction with younger students, in whom ADHD is more commonly diagnosed.

Furthermore, the study investigated the predictive effect of teachers' knowledge of ADHD on the effectiveness of educational support for students with the disorder. The results show that teachers with a high level of knowledge about the diagnosis and symptomatology of ADHD are more effective in engaging students, developing appropriate teaching strategies, and managing the classroom. These findings are consistent with the international literature (Blotnicky-Gallant *et al.*, 2015; Bolinger *et al.*, 2020; Guerra & Brown, 2012; Perold, Louw & Kleymans, 2010; Sciutto *et al.*, 2000), which argues that a high level of knowledge about ADHD is associated with increased effectiveness in educational work.

In addition, it has been shown that decisive predictors of effectiveness in supporting students with ADHD are specialized studies in special education, participation in training programs, and previous experience teaching students with the disorder. Teachers with more extensive training in special education reported higher levels of self-efficacy and confidence in their ability to support students with ADHD and to implement differentiated and adapted teaching practices (Alabd *et al.*, 2018; Gaastra *et al.*, 2020; Mohammed, 2018; Szep *et al.*, 2021).

## **6. Limitations, Implications and Suggestions for Further Research**

The results of this study should be interpreted in light of certain methodological limitations. First, the relatively small sample size ( $N = 151$ ), combined with its non-normal distribution, does not ensure the statistical power required for conducting bivariate analysis tests. To enhance the generalizability of the findings and the external validity of the research, it is advisable that future studies examine primary and secondary school teachers separately. In addition, future research could enrich its methodological framework by utilizing direct observation within the classroom in order to more accurately capture teachers' teaching behavior as well as the support practices applied to students with ADHD.

Despite the aforementioned limitations, the study's findings highlight the importance of the quality of teacher training for understanding and effectively managing ADHD. This highlights the need for more targeted, systematic, and meaningful training for teachers so that they are adequately prepared for the demanding task of supporting students with ADHD in an inclusive educational environment. Given the increasing prevalence of the disorder in the student population, it is necessary for teachers to receive advanced and specialized training on issues related to ADHD so that they can effectively implement specific inclusive teaching strategies. In this context, it would be advisable for higher education institutions to redesign their curricula, strengthening the systematic and in-depth training of future teachers on issues related to ADHD. At the same time, education policymakers could organize training programs and educational workshops

aimed at updating and strengthening the knowledge of active teachers. Finally, school principals are called upon to take initiatives for the periodic training of teaching staff, investing in specialized professionals, such as school psychologists. The latter can play a key role in training and supporting teachers, contributing to a deeper understanding of the needs of students with ADHD, promoting differentiated teaching and developing effective support strategies.

### **Acknowledgements**

Part of the data used in the present study was included in the master's thesis entitled "Teachers' understanding of attention deficit hyperactivity disorder and self-efficacy in supporting students with ADHD", which is available in the University of Peloponnese repository <https://amitos.library.uop.gr/xmlui/handle/123456789/8961>. Furthermore, the first researcher would like to express her gratitude to the master's program "Organization and Management of Sports Activities for People with Disabilities."

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### **Conflict of Interest Statement**

The authors declare no conflicts of interest.

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