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Article

Knowledge, Misconceptions, and Myths of Master's Degree Students about Attention Deficit Hyperactivity Disorder (ADHD)

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Abstract: It is important that Master's Degree students in psychology, regardless of their future specialisation, know about Attention Deficit Hyperactivity Disorder (ADHD). The aim is evaluate and analyse the ADHD-related knowledge held by students of Early Childhood Education and Primary Education. The findings that were obtained in this study (on the chronicity of the disorder, changes in manifestations throughout the life cycle, and the importance of early and multidisciplinary intervention) have clear implications in relation to the specific training in ADHD for future teachers. It is essential to broaden the specific training in relation to ADHD in studies for the Master's Degrees in Early Childhood Education and Primary Education and through continuous training.

Keywords: attention deficit hyperactivity disorder; teachers' knowledge; early childhood education; primary education

1. Introduction

Professionals with a Masters' Degree in Early Childhood Education and Primary Education can play a key role in the early recognition and/or early identification process regarding Attention Deficit Hyperactivity Disorder (ADHD) [1] [2] [3]). Such professionals are in a privileged position, due to their accessibility and comparative experience, whereby they can implement an early detection and pre-evaluation of the child who are suspected of having ADHD within their age group and then collaborate accordingly.

Those professionals are included in the first diagnostic level, the school environment, of the early detection of ADHD, as established in the ADHD Detection Protocol of the Government of Navarra [4]. This is why teachers need to have explicit knowledge of ADHD. This will allow teachers to recognise symptoms, understand the importance of early intervention, and collaborate effectively with other professionals for the benefit of students [5].

ADHD is defined in the Diagnostic and Statistical Manual of Mental Disorders, DSM-5 [6], as a neurodevelopmental disorder. In the current version, the developmental character is emphasised, and it is included in a separate section of conduct disorders and disruptive behaviour, along with Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD).

ADHD is a chronic disorder that are maintained, and its manifestations vary, throughout the life cycle. Thus, hyperactivity-impulsivity symptoms decrease substantially as age increases, while inattention symptoms remain more stable over time [7] . Some studies indicate that ADHD in adults may not start in preschool [8].

Polanczyk et al. [9] developed two meta-analyses on the prevalence of ADHD. Those studies show prevalence figures around 5-7%, which is somewhat higher in children than in adolescents, higher in men than in women, and Biederman and Faraone [10] show more prevalence in clinical populations than when the study is carried out in the community. Scahill and Schwab [11] analysed the prevalence rate based on the informant, which is lower when the informants are the parents, than when an informant is the subject him/herself. Marin et al. [12] note that prevalence data vary according to geographic location and cultures.

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ADHD is a complex disorder, with deficits in multiple basic psychological processes, and alterations in different brain circuits involving different genes [13]. There are several models that take this complexity and heterogeneity into account [14]. Thus, the biopsychosocial model allows us to understand this neurodevelopmental disorder from a triple perspective: biological, psychological, and social (see [15]). The sociocultural approach of Vygotsky provides a perspective to analyse ADHD. There are some key considerations when looking at ADHD from Vygotsky's sociocultural approach [16]: Zone of Proximal Development (ZPD), social mediation, scaffolding theory and cultural context. It is essential to consider the interaction between biological and sociocultural factors to explain ADHD.

The diagnosis cannot be made before the age of 12 years (Diagnostic and statistical manual of mental disorders 5) [6], hence there must be a clear differentiation between the child who is difficult, overactive, and reactive to complicated situations (separation, loss, change of address, etc.) from the child with pathological behaviours.

Teachers play a relevant role for the proper functioning of students at school with these disorders. Not having enough knowledge leads to a lack of criteria for early detection, identification, and diagnosis, and consequently to a lack of psychoeducational response [17] .

The presence of erroneous or preconceived ideas of teachers in relation to ADHD is frequent, which can interfere in both the diagnosis and the intervention [1] [18] [19] [20] [21] [22].

In this regard, [23] provides some examples: (i) All children at this age are very mobile; (ii) All children are still very young, and the diagnosis of attention deficit/hyperactivity disorder cannot be made until the age of 6 years; (iii) The child has a diagnosis of ADHD, but cannot be treated with drugs until the age of 6 years; (iv) My preschool-age child is too young to have ADHD; (v) He is just lazy and unmotivated; (vi) He is a difficult child, or his mind is on something else, but it is normal. Today they do not let children 'be children'; (vii) ADHD treatment will cure it. The goal is to get off the drugs as soon as possible; (viii) He concentrates on video games for hours. (ix) You cannot have ADHD; (ix) ADHD is a consequence of a lack of parental discipline; (x) If, after careful evaluation, a child is not diagnosed with ADHD, she does not need help; (xi) Children with ADHD outgrow this condition.

In this context, the proposal of the present study is to deepen the knowledge, myths, and misconceptions that students in Early Childhood Education and Primary Education have in relation to ADHD.

Our research question revolves around: (i) what future teachers know about ADHD?; (ii) what they do not know about ADHD?, (iii) what they wrongly know about ADHD?; and (iv) are there significant differences in the knowledge of ADHD based on gender?

The results obtained will allow us to make decisions in relation to the curriculums of future teachers of Early Childhood Education and Primary Education.

2. Materials and Methods

The methodology consists of a non-experimental, descriptive method that is based on the application of a questionnaire and a cross-sectional study was developed from September 2020 to September 2021.

2.1. Participants

This study has been developed with the objective of evaluating and analysing the knowledge that students in the Master's Degrees based on Early Childhood Education and Primary Education have in relation to ADHD.

The survey sample of 92 students participated in this study, after 10 participants were eliminated because they answered all of the questions inconsistently and/or left the answer spaces blank.

The participants have no professional experience. They have not completed internships, and they have not received other specialized training in relation to this subject.

The participants are not professionals. All of the students will have completed a basic course in Developmental and Educational Psychology that allows them to know about the typical development

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of a child. This would facilitate student awareness of those children who deviate from a developmental pathway, either because there is a developmental lag, or because there is a qualitative change.

The participants are not teachers by this reason erroneous ideas have not been evaluated, due to the nature of the standardised instruments with the stated objective.

The participants have no prior formal knowledge of ADHD, except for the knowledge they may have acquired informally from their own personal history (if they are students with ADHD), or if they have a family member with ADHD. The selected students do not have this knowledge, in either the formal or the informal sense.

The participants are students who have a good and regular attendance record regarding lectures. At the University, attendance is not mandatory, which is why the sample size have been reduced to those students who actually regularly attend at least 75% of the theoretical-practical sessions.

2.2. Data collection instrument

The students have completed, with prior informed consent, the scale of Knowledge about Attention Deficit Disorders (KADDS) (adapted from [24]).

To carry out this short questionnaire with brief and easy-to-understand questions, it was administered during the first semester of the 2020/2021 and 2021/2022 academic year, online through the MiAulario platform of UPNA (for virtual teaching, learning, and collaboration), with prior information and consent from the participants.

The questionnaire was available for answering by the students during the practical classes, or at a time considered by the student to be convenient, and it were answered anonymously and voluntarily. The data were subsequently analysed using the SPSS programme.

The Spanish adaptation of the estimation scale (KADDS) (adapted from [24]) was applied in an online format. It is made up of 36 items with three response alternatives (True, False, and I Don't Know). The items are grouped into three subscales: (i) ADHD Symptoms/Diagnosis; (ii) General information on the nature, causes, and repercussions of ADHD; (iii) Treatment of ADHD.

Appendix A presents the knowledge scale on attention deficit disorders, and the responses to the items.

3. Results

Descriptive and inferential analyses was performed:

i) Descriptive analyses is initially presented, in order to respond to the first question of the study, and then inferential analyses are presented to respond to first three questions regarding possible differences based on sex.

ii) The data are subjected to descriptive and inferential analyses (comparative and associative) based on sex, in order to respond to the fourth question of the study.

3.1. Descriptive

Table 1 presents the descriptive data of the scores obtained by the participants in the Spanish adaptation of the Teachers' Knowledge of Attention Deficit Hyperactivity Disorder (KADDS) (adapted [24]).

Table 1. Descriptive data for the total score and the three scales of the Spanish adaptation of the Knowledge of Attention Deficit Hyperactivity Disorder (KADDS) (adapted from [24]).

		Scales		
Descriptive statistics	**Total score**	**General information on the nature, causes, and repercussions of ADHD**	**ADHD Symptoms/Diagnosis**	**Treatment of ADHD**

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Mean	11.7	0.61	0.30	0.14
Standard error of the mean	0.607	0.04	0.01	0.01

Table 2 shows the frequencies and percentages of the items that are included under the dimension of "ADHD Symptoms/Diagnosis".

In this dimension, it is observed that there are errors, when a lower percentage of participants answered false items that are false, compared to participants who answered false items as true items: (i) Children with ADHD are frequently distracted by external stimuli (22.8%); (ii) One of the core symptoms of children with ADHD is that they are physically cruel to others (1.1%); (iii) One of the fundamental symptoms of children with ADHD is that they have an inflated or exaggerated sense of their own importance (grandiosity) (37%); (iv) It is possible for an adult to be diagnosed with ADHD, as long as the symptoms appeared in childhood (4.3%); (v) In the majority of children with ADHD, the symptoms subside at the onset of puberty and, as a consequence, their behaviour is already normal in adulthood (17.4%); (vi) Reducing the intake of sugar in the diet or food additives is usually effective in reducing ADHD symptoms (38.0%); (vii) When a child is diagnosed with ADHD, he/she usually receives special education services to reduce the core symptoms of the disorder (1.1%); (viii) Among young children (under 4 years of age), problem behaviours that are characteristic of children with ADHD (e.g., hyperactivity, inattention) can be distinguished from age-appropriate behaviours. (9.8%); (ix) If a child responds to stimulant medications (e.g., Ritalin), she/he probably has ADHD (35.9%).

In this dimension it is observed that there are errors, when a lower percentage of participants answered true items that are true, compared to participants who have answered items that are true as false items: (i) The current literature on ADHD suggests that there are two groups of symptoms: a) inattention, and b) hyperactivity-impulsivity (31.5%).

Table 2. Frequencies and percentages of the dimension of "ADHD Symptoms/Diagnosis".

ADHD Symptoms/Diagnosis	True	False	Not Answered
Most studies suggest that ADHD affects approximately 15% of school-age children.	3.3	96.7	-
Children with ADHD are frequently distracted by external stimuli.	77.2	22.8	-
Children with ADHD are normally more compliant with their fathers than with their mothers.	41.3	57.6	1.1
For a child to be diagnosed with ADHD, the symptoms must have appeared before the age of 7 years.	16.3	81.5	2.2
One of the central symptoms of children with ADHD is that they are physically cruel to others.	98.9	1.1	-
One of the fundamental symptoms of children with ADHD is that they have an inflated or exaggerated sense of their own importance (grandiosity).	62.0	37.0	1.1
It is possible for an adult to be diagnosed with ADHD, as long as the symptoms appeared in childhood.	94.6	4.3	1.1
The current literature on ADHD suggests that there are two groups of symptoms: a) inattention, and b) hyperactivity-impulsivity.	31.5	68.5	-
Depressive symptoms are found more frequently in children with ADHD than in children without ADHD.	51.1	48.9	-

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In most children with ADHD, the symptoms subside at the onset of puberty and, as a consequence, their behaviour is already normal in adulthood.	81.5	17.4	1.1
For a child to be diagnosed with ADHD, he/she must present central symptoms in two or more contexts (e.g., home and school).	68.5	30.4	1.1
Reducing the intake of sugar in the diet or food additives is often effective in reducing ADHD symptoms.	60.9	38.0	1.1
When a child is diagnosed with ADHD, he/she often receives special education services to reduce the core symptoms of the disorder.	98.9	1.1	-
Among young children (under 4 years of age), problem behaviours that are characteristic of children with ADHD (e.g., hyperactivity, inattention) can be distinguished from age-appropriate behaviours.	90.2	9.8	-
Children with ADHD differ more from children without ADHD in school contexts, rather than in free-play situations.	81.5	18.5	-
If a child responds to stimulant medications (e.g., Ritalin), he/she probably has ADHD.	63.0	35.9	1.1
Children with ADHD generally show an inflexible adherence to specific routines that do not pursue a specific goal (e.g., rituals).	17.4	82.6	-

Table 3 shows the frequencies and percentages of the items that are included under the dimension of "General information on the nature, causes, and repercussions of ADHD". In this dimension it is observed that there are errors, when a lower percentage of participants answered false items that are false, compared to participants who have answered items that are false as true items: (i) Most children with ADHD have a history of theft and destruction of the property of others (6.5%); (ii) If a child with ADHD demonstrates sustained attention span regarding television or video games for one hour, this child is also capable of sustained attention span for at least one hour in class or while doing homework (23.9%); (iii) There are specific physical characteristics that can be identified by clinicians, in order to make a definitive diagnosis of ADHD (39.1%); (iv) Among school-age students, the prevalence of ADHD in boys and girls is equivalent (14.1%).

In this dimension, it is observed that there are errors, when a lower percentage of participants answered true items that are true, compared to participants who answered items that are true as false items: (i) Children with ADHD often fidget when they are seated (22.8%); (ii) Children with ADHD often have difficulties when organising tasks and activities (40.2%).

Table 3. Percentages of the dimension "General information on the nature, causes, and repercussions of ADHD".

General information about the nature, causes, and repercussions of ADHD	**True**	**False**	**Not Answered**
Current research suggests that ADHD is, to a large extent, the result of parental incompetence.	20.7	79.3	-
ADHD is more common in first-degree biological relatives (eg father, mother) of children with ADHD than in the general population.	47.8	51.1	1.1
Children with ADHD often fidget when seated.	22.8	77.2	

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Most children with ADHD have a history of stealing and destroying other people's property.	91.3	6.5	2.2
If a child with ADHD demonstrates sustained attention span regarding television or video games for one hour, this child is also capable of sustained attention span for at least one hour in class or while doing homework.	75.0	23.9	1.1
Children with ADHD often have difficulty organising tasks and activities.	40.2	57.6	2.2
Children with ADHD typically experience more problems in novel contexts than in familiar contexts.	16.3	83.7	-
There are specific physical characteristics that can be identified by doctors in order to make a definitive diagnosis of ADHD.	60.9	39.1	-
Among school-age students, the prevalence of ADHD in boys and girls is equivalent.	84.8	14.1	1.1
Most children with ADHD have some degree of poor academic performance in elementary school, compared to other children their age.	63.0	34.8	2.2
ADHD symptoms are often also seen in children without ADHD, who come from chaotic and inappropriate home environments.	27.2	70.7	2.2
Research has shown that prolonged use of stimulants can lead to addiction in later life (e.g., drug abuse).	76.1	23.9	-

Table 4 shows the frequencies and percentages of the items that are included under the dimension of "ADHD Treatment".

In the dimension of "ADHD Treatment", it is observed that there are errors, when a lower percentage of participants answered false items that are false, compared to participants who answered false items as true items: (i) Antidepressants have been effective in reducing the symptoms of many children with ADHD (13%); (ii) Individual psychotherapy is normally sufficient for the treatment of the majority of children with ADHD (32.6%); (iii) Electroconvulsive therapy (i.e., shock treatment) has been shown to be an effective treatment for severe cases of ADHD (25.0%).

Further, in this dimension, it is observed that there are errors, when a lower percentage of participants answered true items that are true, compared to participants who answered true items as false items: (i) Training parents and teachers in the handling of a child with ADHD is usually effective when combined with the medication that is often prescribed for these children (8.7%).

Table 4. Percentages of the dimension of "ADHD Treatment".

ADHD treatment	**True**	**False**	**Not Answered**
Antidepressants have been effective in reducing symptoms for many children with ADHD.	87.0	13.0	-
Training for parents and teachers in the management of a child with ADHD is usually effective when combined with the medication that is often prescribed for these children.	8.7	90.2	1.1
When treatment for a child with ADHD has ended, it is rare for his/her symptoms to return.	10.9	88.0	1.1

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Side effects of the stimulant medications that are used to treat ADHD can include decreased appetite and moderate insomnia.	71.7	27.2	1.1
Individual psychotherapy is usually sufficient for the treatment of most children with ADHD.	66.3	32.6	1.1
In severe cases of ADHD, medication is often used before other techniques (e.g., behaviour modification techniques) are attempted.	22.8	77.2	-
Stimulant medication is the most widely used type of medication to treat children with ADHD.	83.7	15.2	1.1
Psychological/behavioural interventions for children with ADHD focus primarily on children's problems concerning lack of attention.	8.7	90.2	1.1
Electroconvulsive therapy (i.e., shock treatment) has been shown to be an effective treatment for severe cases of ADHD.	75.0	25.0	-
ADHD treatments that focus primarily on punishment are the most effective treatments in reducing symptoms.	22.8	72.8	4.3

Table 5 shows the frequencies and total percentages that are included under the three dimensions that make up the questionnaire: (i) In "ADHD Diagnosis/Symptoms", it is found that 52.94% of the false items are not identified as false and 5.88% of true items are not identified as true; (ii) In "General information on the nature, causes, and repercussions of ADHD" it is verified that 16.67% of the false items are not identified as false, and 8.33% of true items are not identified as true; (iii) In "ADHD Treatment" it is verified that 10.00% of the false items are not identified as false and 10.00% of true items are not identified as true.

It is in the dimension of "ADHD Symptoms/Diagnosis" where more total errors are found (58.82%), compared to the other two dimensions that make up the questionnaire: General information on the nature, causes, and repercussions of ADHD and Treatment of ADHD.

Table 5. Total misconceptions (frequency and percentage) in the different dimensions.

Dimensions	True	False	Total
ADHD Symptoms/Diagnosis.	5.88	52.94	58.82
General information on the nature, causes, and repercussions of ADHD.	8.33	16.67	50.00
Treatment of ADHD.	10.00	10.00	40.00

3.2. Inferential patterns

Table 6 presents a summary of the Hypothesis Contrast Analysis for items based on sex. Significant differences are observed between men and women in the following items: (i) Training for parents and teachers in handling a child with ADHD is usually effective when combined with the medication that is often prescribed for these children; (ii) One of the fundamental symptoms of children with ADHD is that they have an inflated or exaggerated sense of their own importance (i.e., grandiosity); (iii) ADHD treatments that focus primarily on punishment are the most effective in reducing symptoms.

Table 6. Summary of Hypothesis Contrast Analysis for items based on sex.

Number	Items	Sig.[a,b]

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10	Training for parents and teachers in the management of a child with ADHD is usually effective when combined with the medication that is normally prescribed for these children.	.004**
11	One of the fundamental symptoms of children with ADHD, is that they have an inflated or exaggerated of their own importance (grandiosity).	.024*
36	ADHD treatments that focus primarily on punishment are the most effective in reducing symptoms.	.004**

N=92, * $p < .05$; ** $p < .01$, Only statistically significant items are presented.

Table 7 presents a Summary of the Mann-Whitney U test of independent samples for item 10 "Training parents and teachers in the management of a child with ADHD is usually effective when combined with the medication that is often prescribed for these children" (dimension of ADHD Treatment). The average range for men is 53.38, which is higher than the average range for women (44.07).

Table 7. Summary of Mann-Whitney U test of independent samples for item 10.

Statistic	Value
Mann-Whitney U-statistic	651.000
Wilcoxon W-statistic	2997.000
Test Statistic	651.000
Asymptotic two-sided significance	.004**

N=92, ** $p < .01$.

Item 10: Training for parents and teachers in the management of a child with ADHD is usually effective when combined with the medication that is normally prescribed for these children

Table 8 presents a Summary of the Mann-Whitney U test of independent samples for item 11: "One of the fundamental symptoms of children with ADHD is that they have an inflated or exaggerated sense of their own importance (grandiosity)" (dimension of ADHD Symptoms/Diagnosis). The average range for men is 55.42, which is higher than the average range for women (43.55).

Table 8. Summary of the Mann-Whitney U test of independent samples for item 11.

Statistic	Value
Mann-Whitney U-statistic	602.000
Wilcoxon W-statistic	2948.000
Test Statistic	602.000
Asymptotic two-sided significance	.024*

N=92, * $p < .05$.

Item 11: One of the fundamental symptoms of children with ADHD, is that they have an inflated or exaggerated of their own importance (grandiosity).

Table 9 presents a Summary of the Mann-Whitney U test of independent samples for item 36 "ADHD treatments that focus primarily on punishment are the most effective in reducing symptoms" (dimension of ADHD Treatment). The average range for men is 57.04, which is higher than the average range for women (42.78).

Table 9. Mann-Whitney U test of independent samples for item 36.

Statistic	Value
Mann-Whitney U-statistic	602.000
Wilcoxon W-statistic	2948.000
Test Statistic	602.000

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Asymptotic two-sided significance	.024*

N=92, * $p < .05$.

Item 36: ADHD treatments that focus primarily on punishment are the most effective in reducing symptoms.

In the study of the items that were grouped into the three dimensions that make up the questionnaire, no significant differences were found that were based on gender (Table 10).

Table 10. Summary of hypotheses contrasts for dimensions based on sex.

Dimensions	Sig
General information on the nature, causes, and repercussions of ADHD	.477
ADHD Symptoms/Diagnosis	.773
Treatment of ADHD	.054*

N=92, * $p < .05$.

The chi-square statistic was applied and the statistic in all the scales and in the total took a large value, being statistically significant in all of them (Table 11).

Table 11. Test statistics.

	General information on the nature, causes, and repercussions of ADHD	ADHD Symptoms/Diagnosis	Treatment of ADHD	Total
Chi-cuadrado	121.217	123.087	155,000	85,848
gl	15	16	12	26
Sig. asintótica	.000**	.000**	.000**	.000**

* $p < .05$; ** $p < .01$; *** $p < .001$.

4. Discussion

In this study, we aimed to examine the knowledge and misconceptions of ADHD for future teachers of Early Childhood Education and Primary Education.

Teachers of Early Childhood Education and Primary Education play a fundamental role as key informants in the early identification of students with ADHD, as established in the ADHD Early Detection Protocol that were prepared by the Navarra Special Education Resource Centre of the Government of Navarra.

The data collected in the present study indicate knowledge of some relevant factors; however, it is observed that certain aspects are unknown by the largest part of the respondents.

Teachers have a moderate level of knowledge of ADHD, a higher level of knowledge about ADHD treatment, and a lower level of knowledge about the symptoms/diagnosis of the disorder. Teachers are more familiar with issues of ADHD treatment, but there is a significant knowledge gap regarding more difficult issues, such as ADHD symptoms/diagnosis and general information on the nature, causes, and impact of ADHD.

We highlight two main conclusions from this study:

i) Teachers' scores on the Knowledge of Attention Deficit Hyperactivity Disorder (KADDS) indicated the presence of errors for both true items being identified as false and false items being identified as true, thus indicating a significant lack of knowledge of ADHD. The results of this study are in line with the findings of previous studies [20] [21] [22] [25]. It is necessary to train future teachers, in order to advance their professional development regarding ADHD. Evidence confirms that teachers who have knowledge of ADHD are better prepared to respond to the needs of children with ADHD [26].

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The fact that teachers have knowledge of attention deficit hyperactivity disorder (ADHD) can have a significant long-term impact in several aspects. Here are some ways to have positive effects [27]: (a) early identification, (b) teaching adaptation, (c) Behaviour Management; (d) Collaboration with other professionals. These factors contribute to improving the academic, emotional, and social outcomes of students with ADHD, which in turn can have a lasting impact on their development and well-being throughout their lives.

ii) Statistically significant differences has been found between men and women in three items, two of which are linked to the dimension of ADHD Treatment, and the third item is linked to the dimension of Diagnosis and Treatment. It would be interesting to consider what explains the differences that exist, based on sex (see [18]).

We note that teachers' lack of knowledge of the diagnostic criteria in the DSM-5R can hinder the early identification of disorders. This lack of familiarity can influence early identification by teachers [28]: (a) lack of symptom recognition; (b) stigmatisation and mislabelling; (c) lack of communication with other professionals; (d) lack of early interventions.

This will allow teachers to recognise symptoms, understand the importance of early intervention, and collaborate effectively with other professionals for the benefit of students [29].

We note that aiming at predicting the student teacher preparation results regarding ADHD can be challenging [30]. Student teachers who have a good knowledge of ADHD may be better equipped to understand the specific needs and challenges of students with ADHD [31].

The findings of this study are not conclusive, although they do have implications in relation to ADHD training for future teachers. Training would include formal training in Graduate and Postgraduate studies (Master's Degree and PhD), informal training (conferences and continuous training courses), or other types of specific training. It is essential to broaden the specific training in relation to ADHD in studies for Master's Degrees in Early Childhood Education and Primary Education, and in Double Major Degrees, through continuous and general training.

The lack of cooperation among schools, parents, and therapeutic institutions can inhibit a multimodal treatment programme (see [32]). [20] probed the knowledge and attitudes of teachers regarding ADHD, and this is a future line of research.

The majority of teachers do not receive any training course during their undergraduate studies, and they do not have any workshop on ADHD, hence there is a need to provide continuous training courses in ADHD to teachers.

Providing continuous and specific training courses (both formal and informal) in ADHD which are aimed at Early Childhood Education teachers is in line with the proposals by [21]. This training may have the following general objectives: (i) avoid "labelling" as ADHD, any child who is restless or annoying; (ii) be able to differentiate between normal behaviours, and behaviours that are warning indicators of this neurodevelopmental disorder; (iii) guide possible doubts of parents and family regarding ADHD; (iv) know how to teach on attention to diversity; (vi) contribute to early detection of ADHD as key informants in collaboration with families and professionals.

5. Conclusions

Early diagnosis of ADHD is essential. Teachers are often the first people to encounter children who are most likely to have ADHD. Therefore, teachers must have sufficient knowledge of ADHD, in order to understand the disorder in depth. This will help them to reduce their insecurity in the classroom, have a favorable attitude towards children with ADHD, communicate with children who have ADHD, and manage children with ADHD in an appropriate way [19].

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Appendix A

Questionnaire Knowledge of Attention Deficit Disorder Scale (adapted from [24])

	Items	Scale	Responses		
1	Most studies suggest that ADHD affects approximately 15% of school-age children.	SD	T	F	DK
2.	Current research suggests that ADHD is, to a large extent, the result of parental incompetence.	GI	T	F	DK
3.	Children with ADHD are frequently distracted by external stimuli.	SD	T	F	DK
4.	Children with ADHD are normally more compliant with their fathers than with their mothers.	SD	T	F	DK
5.	For a child to be diagnosed with ADHD, the symptoms must have appeared before the age of 7 years.	SD	T	F	DK
6.	ADHD is more common in first-degree relatives (FDRs) (e.g., father, mother) of children with ADHD than in the general population.	GI	T	F	DK
7.	One of the central symptoms of children with ADHD, is that they are physically cruel to others.	SD	T	F	DK
8.	Antidepressants have been effective in reducing symptoms for many children with ADHD.	T	T	F	DK
9.	Children with ADHD often fidget when seated.	GI	T	F	DK
10.	Training for parents and teachers in the management of a child with ADHD is usually effective when combined with the medication that is commonly prescribed for these children.	T	T	F	DK
11.	One of the fundamental symptoms of children with ADHD is that they have an inflated or exaggerated sense of their own importance (i.e., grandiosity).	SD	T	F	DK
12.	When treatment for a child with ADHD has ended, it is rare for the child's symptoms to return.	T	T	F	DK
13.	It is possible for an adult to be diagnosed with ADHD, as long as the symptoms appeared in childhood.	SD	T	F	DK
14.	Most children with ADHD have a history of stealing and destroying other people's property.	GI	T	F	DK
15.	Side effects of the stimulant medications that are used to treat ADHD can include decreased appetite and moderate insomnia.	T	T	F	DK
16.	The current literature on ADHD suggests that there are two groups of symptoms: a) inattention, and b) hyperactivity-impulsivity.	SD	T	F	DK
17.	Depressive symptoms are found more frequently in children with ADHD, than in children who do not experience ADHD.	SD	T	F	DK
18.	Individual psychotherapy is usually sufficient for the treatment of most children with ADHD.	T	T	F	DK
19.	In most children with ADHD, the symptoms subside at the onset of puberty and, as a consequence, their behaviour is already normal in adulthood.	SD	T	F	DK
20.	In severe cases of ADHD, medication is often used before other techniques (such as behaviour modification techniques) are attempted.	T	T	F	DK

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21.	For a child to be diagnosed with ADHD, he/she must present central symptoms in two or more contexts (e.g., home and school).	SD	T	F	DK
22.	If a child with ADHD demonstrates sustained attention span regarding television or video games for one hour duration, this child is also capable of sustained attention span for at least one hour duration in class, or while doing homework.	GI	T	F	DK
23.	Reducing the intake of sugar in the diet or food additives is often effective in reducing ADHD symptoms.	SD	T	F	DK
24.	When a child is diagnosed with ADHD, he/she often receives special education services to reduce the core symptoms of the disorder.	SD	T	F	DK
25.	Stimulant medication is the most widely used type of medication to treat children with ADHD.	T	T	F	DK
26.	Children with ADHD often have difficulty organising tasks and activities.	GI	T	F	DK
27.	Children with ADHD typically experience more problems in novel contexts than in familiar contexts.	GI	T	F	DK
28.	There are specific physical characteristics that can be identified by doctors, in order to make a definitive diagnosis of ADHD.	GI	T	F	DK
29.	Among school-age students, the prevalence of ADHD in boys and girls is equivalent.	GI	T	F	DK
30.	Among young children (under 4 years of age), problem behaviours that are characteristic of children with ADHD (e.g., hyperactivity, inattention) can be distinguished from age-appropriate behaviours.	SD	T	F	DK
31.	Children with ADHD differ more from children without ADHD in school contexts, rather than in free-play situations.	SD	T	F	DK
32.	Most children with ADHD have some degree of poor academic performance in elementary school, compared to other children their age.	GI	T	F	DK
33.	ADHD symptoms are often also seen in children without ADHD, who come from chaotic and inappropriate home environments.	GI	T	F	DK
34.	Psychological/behavioural interventions for children with ADHD focus primarily on children's problems regarding inattention.	T	T	F	DK
35.	Electroconvulsive therapy (e.g., shock treatment) has been shown to be an effective treatment for severe cases of ADHD.	T	T	F	DK
36.	ADHD treatments that focus primarily on punishment are the most effective treatments in reducing symptoms.	T	T	F	DK
37.	Research has shown that the prolonged use of stimulants can lead to addiction in later life (i.e., drug abuse).	GI	T	F	DK
38.	If a child responds to stimulant medications (e.g., Ritalin), she/he probably has ADHD.	SD	T	F	DK
39.	Children with ADHD generally show an inflexible adherence to specific routines that do not pursue a specific goal (e.g., rituals).	SD	T	F	DK

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Key: Items assigned to scales: GI= General information on the nature, causes, and repercussions of ADHD; SD ADHD Symptoms/Diagnosis; T= Treatment of ADHD, Answers: T= True; F= False; DK = Don't know.

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