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Teachers' Knowledge of ADHD and its Background Variables: A Questionnaire-Based Study in Hungary

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ABSTRACT. ADHD is among the most frequently diagnosed child psychiatric condition. Teachers play an important role in identifying ADHD and providing appropriate education for children with ADHD. The KADDS scale is a tool commonly used to measure teachers' knowledge of ADHD. Using the KADDS scale and a background questionnaire, we conducted a survey of a sample of Hungarian teachers (n=158). Results reveal that our sample's general level of knowledge is 62.5%. Our statistical correlation analyses show that the two most important background factors that affect the level of knowledge are attendance at ADHD training and a family member or close relative diagnosed with ADHD.

Keywords: *ADHD; teachers' knowledge; KADDS; inclusive education.*

INTRODUCTION

ADHD is among the most frequently diagnosed disorders within child psychiatry. According to DSM-5, its highly varied symptoms include attention deficit disorder and hyperactivity/impulsivity (APA, 2013). The behavioral features of ADHD do not exist in a binary (i.e. typical-atypical) form; rather, they lie along a continuum, with patterns varying from one individual to the next. This also means either that, in certain situations, some aspects of ADHD are likely to be adaptive rather than detrimental, or that some of those concerned

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are likely to have certain strengths or traits that can compensate for their ADHD-related difficulties (Sedgwick et al., 2019). Self-report-based research has identified many positive aspects of ADHD, such as creativity, flexibility, dynamism, or honesty (Schippers et al., 2022).

The underlying causes of ADHD include complex multifactorial pathologies (e.g. genetics, perinatal complications, alcohol consumption during pregnancy, etc.), and ADHD has a diverse neurobiological and neuropsychological background (Roberts et al., 2015).

International studies have found prevalence to be around 5% (Polanczyk et al., 2007). The boy-to-girl ratio in childhood is 3:1, while the ratio among those seeking medical help is 6:1. The ratio of school-age and adolescent boys is 2.3–2.4 times higher; while gender gap is not that wide among preschoolers and adults (1.8:1 and 1.6:1, respectively) (Willcutt, 2012).

People diagnosed with ADHD often have difficulty in adjusting to familial, social, and school expectations. Self-control and self-discipline in the classroom may pose challenges to these children, which often results in behavioral difficulties, continuous reprimands, a negative self-image, and a feeling of being mistreated at school (Strelow, 2021). These difficulties adversely affect academic performance (Pang et al., 2021).

ADHD may often occur with several other psychiatric disorders, such as oppositional defiant disorder (25–50%), conduct disorder (25%), anxiety disorders, depression, OCD, tic disorders, autism spectrum disorder, etc. (APA, 2013). The presence of other disorders accompanying ADHD may also influence its emergence and outcome to a large extent.

The Importance of Teachers' Knowledge in Inclusive Education for Children Diagnosed with ADHD

ADHD is also a challenge for teachers, as their teaching practice has to be employed in situations that differ from normal circumstances. Teachers can identify the potential predictive signs of ADHD, as school situations are, by nature, stressful for a child with ADHD. Therefore, symptoms may be more frequent in the classroom and can act as a reliable informant for clinical staff in the diagnostic process (Barkley, 2009). Teachers, however, play a crucial role in supporting students with ADHD in school, and should be trained to recognize the behavioral, cognitive and emotional characteristics of children with ADHD, support inclusive interventions (e.g. differentiated tuition, developing individualized motivational systems, etc.) in the classroom, and provide feedback to families (Robledo-Castro, 2024).

Teachers' attitude has been identified as one of the key factors for the success of inclusive education (Dogan & Beginsoy, 2017; Lindner et al., 2023; Papp et al., 2012; Shareefa, 2016). Research suggests that teachers' attitude towards students with special educational needs is closely related to the knowledge they have acquired about the subject during their pedagogical studies (Cueli et al., 2022).

Teachers' attitudes and knowledge about inclusion can predict teachers' effectiveness in applying inclusive teaching strategies in the classroom (Alsarawi & Sukonthaman, 2023; Jones, 2020; Opoku et al., 2021).

In addition, numerous other studies (Kwon et al., 2017; Movkebayeva, 2016; Pershina et al., 2018; Zulfija et al., 2013) have confirmed that knowledge of inclusive education constitutes a significant factor in the effective implementation of inclusive practices. Subsequent research has consistently demonstrated a relationship between teachers' knowledge and understanding and their familiarity with inclusive education (Ekstam et al., 2018; Leyser et al., 2011; Mngo & Mngo, 2018; Rabi et al., 2018; Sharma et al., 2018; You et al., 2019). In their meta-analysis, Brock and Carter (2017) have found a deep impact of intensive teacher training programs on how they manage students.

In their research, Ohan et al. (2008) found that, in general, teachers with profound knowledge of ADHD and, to some extent, those with average knowledge reported a higher number of instances of helping attitude (e.g. seeking help for their students) and more positive perception (e.g. becoming aware of the benefits of behavioral and special education methods). Teachers' knowledge about ADHD also plays an important role in identifying the problem correctly and asking for help (Sciutto et al., 2016).

Teachers' Knowledge About ADHD

Our daily practice and extensive international literature show that teachers' knowledge of ADHD is insufficient. In order for inclusive education for children diagnosed with ADHD to be successful, deeper knowledge of the status and characteristics of students with ADHD is needed.

Research reveals that many teachers feel unprepared to deal with students diagnosed with ADHD and would like to have more opportunities to develop their competence (Al-Omari et al., 2015; Martinussen et al., 2011; Mohr-Jensen et al., 2019; OECD, 2019; Snider et al., 2003).

As a result of this knowledge deficit, teachers are likely to feel that attention and discipline problems, which can be common with children diagnosed with ADHD, place increasingly high burden upon them (Moore et al., 2017; Nash et al., 2016).

Evaluation of Teachers' Knowledge with the KADDS Questionnaire

The Knowledge of Attention Deficit Disorder Scale (KADDS) is a 39-item scale that measures teachers' knowledge of and misconceptions about ADHD in three areas: general information about the nature, causes and prognosis of ADHD (15 items); symptoms and diagnosis of ADHD (9 items); and treatment of ADHD (12 items). Questions can be answered with 'True', 'False' and 'I don't know' responses (Sciutto & Feldhamer, 2005).

In prior research conducted with US samples, the internal consistency of the overall KADDS score demonstrated Cronbach's alpha values ranging from 0.82 to 0.89 (Herbert et al., 2004; Sciutto et al., 2016). The validity of the Cr. α values of the three subscales varied in the different studies: the general information subscale Cr. α 0.54–0.74, the symptoms and ADHD diagnosis subscale Cr. α 0.52–0.75, and the ADHD treatment subscale Cr. α 0.61–0.75. The most satisfactory values were obtained in the study conducted by Herbert et al. (2004): general information Cr. α 0.74, symptoms Cr. α 0.75, and treatment Cr. α 0.75.

The KADDS scale is widely used internationally to measure teachers' knowledge of ADHD. Table 1 presents data from European, American and Asian countries on the level of general knowledge about ADHD as measured by the KADDS scale. These data show that though the proportion of correct answers across samples from different countries varies widely, knowledge about ADHD ranges from low to moderate.

Table 1. Teachers' general level of knowledge about ADHD as measured by the KADDS scale based on research in different countries.

Country	Sample size (persons)	Overall knowledge level (proportion of correct answers in percentage share (%))
Czech Republic (Sciutto et al., 2016)	482	57
Germany (Sciutto et al., 2016)	350	54
Greece (Sciutto et al., 2016)	198	47
Iraq (Sciutto et al., 2016)	200	45
South Korea (Sciutto et al., 2016)	146	39
Saudi Arabia (Sciutto et al., 2016)	429	15
South Africa (Sciutto et al., 2016)	212	52
USA (Sciutto et al., 2016)	159	62
Vietnam (Sciutto et al., 2016)	131	33
Canada, Nova Scotia (Blotnicky-Gallant et al., 2015)	113	68
Spain (Cueli et al., 2022)	170	68.91

Country	Sample size (persons)	Overall knowledge level (proportion of correct answers in percentage share (%))
South Korea (Lee et al., 2020)	73	64.4
New Zealand (Dilaimi, 2013)	84	48.3
Kenya (Kablra, 2012)	24	42.6
USA, South Texas (Guerra & Brown, 2012)	107	46.49
Saudi Arabia (Alshammari, 2020)	89	41
Saudi Arabia (Al-Moghamsi et al., 2018)	416	38 ± 11.3
Egypt (Farag et al., 2024)	213	41.1
Portugal (Rodrigues et al., 2013)	1,109	39.36
Greece (Galanis et al., 2021)	152	49.9
Spain (Jarque Fernández et al., 2007)	146	42.5
South Africa (Perold et al., 2010)	552	42.6
USA (Sciutto et al., 2000)	149	47.8

METHODS

The target group of the study are teachers working in Hungarian schools. In order to collect data, we used an online questionnaire the public link of which was shared on various social media platforms that teachers use (e.g. Facebook and Instagram), and recruited participants using the snowball method. At the top of the questionnaire brief information about the purpose of the data collection, voluntary participation and anonymity was provided. The background questionnaire and the KADDS scale together took 20–25 minutes to complete.

Participants

A total of 158 primary school teachers participated in the study by completing the questionnaires. The students they taught ranged in age from 6 to 15 years. The mean age of the participating teachers was 45.2 years, with an average of 17.8 years of teaching experience. Of the respondents, 156 were female and 2 were male.

Tools

Background Questionnaire

The background questionnaire collected basic demographic information (age, years of teaching experience, type of workplace), and included items

regarding prior experience with children diagnosed with ADHD (both teaching-related and within the respondents' personal circles), as well as participation in in-service training related to ADHD.

KADDS. As KADDS was originally developed in English, and the participants were teachers who are native speakers of Hungarian, it had to be translated into Hungarian. The translation was done by a special education teacher and a psychologist. The questionnaire was then translated back into English. Finally, the two English versions were examined to see how much of the original semantic content of the questions had been preserved. Where semantic discrepancies were identified, the translated items were refined to better preserve the original meaning of the questions. To finalize the translation and support decision-making, the translated items were also compared with a previously available Hungarian version of the questionnaire, which had demonstrated low reliability (Benke & Lukács, 2022). Finally, a pilot study involving thirty teachers asked to comment on how easy it was for them to understand the individual questions was conducted. The suggestions provided were incorporated into the final version of the questionnaire. Prior to the current research, we assessed the reliability of the Hungarian version of the scale on a sample of 400 respondents. Our data show that it measures reliably in terms of its total scores. Regarding this sample of 400 respondents, the reliability of the questionnaire is Cronbach's α=0.742, which, considering the sample size and the three sub-scales, is a correct value for a questionnaire measuring declarative knowledge. Reliability indices for the three subscales were as follows: general information regarding the nature, causes, and prognosis of ADHD ('G' subscale): Cronbach's $\alpha = 0.554$; symptoms and diagnosis of ADHD ('S' subscale): Cronbach's $\alpha = 0.442$; and treatment of ADHD ('T' subscale): Cronbach's $\alpha = 0.563$ (Szigethi, 2024). Given the low reliability coefficients obtained for the individual subscales, correlations with the subscales were not examined; instead, the overall level of knowledge in each domain is presented.

RESULTS

Teachers' General Knowledge About ADHD

In the present sample, the mean number of correct responses on the 36-item KADDS questionnaire (KADDS total score) was 22.5 (SD = 4.7). When expressed as a percentage, the mean proportion of correct responses was 62.5% (SD = 12.9%). In line with the KADDS Manual (Sciutto et al., 2000), the percentage of correct responses is interpreted as the indicator of knowledge level assessed by the KADDS questionnaire.

The proportion of correct answers on the three sub-scales of the KADDS questionnaire also represents the level of knowledge for each sub-scale.

Correlations with the Data from the Background Questionnaire

ADHD-Independent Background Variables Pertaining to Teachers

The Pearson correlation does not show any significant correlations between age and ADHD-knowledge measured by the KADDS scale (p=0.708), i.e. there is no linear relationship between age and knowledge. However, when teachers are grouped according to their age (age group 1: 22–35 years of age /27 persons/, age group 2: 36–45 years of age /41 persons/, age group 3: 46–55 years of age/70 persons/, age group 4: 56–67 years of age /20 persons/), and an ANOVA analysis of variance followed by Tukey's post-test is conducted, our results show that the difference between the highest measured level of knowledge for age group 1 (67.0%) and the lowest average value for age group 2 (58.5%) is significant (F=3.072, p=0.030). No significant difference was found between the other age groups.

The Pearson correlation did not establish any linear interconnection between the number of years in teaching and the level of knowledge measured by the KADDS questionnaire (p=0.629) either. Based on the number of years in teaching, the respondents were included in four groups: 1–5 years (32 respondents), 6–15 years (45 respondents), 16–29 years (51 respondents) and 30–46 years (30 respondents). Based on the results of the ANOVA analysis of variance, differences between the groups in terms of knowledge about ADHD were not significant (F=0.401, p=0.753).

ADHD-Related Background Variables for Teachers

Based on whether those completing the questionnaire currently teach a student with ADHD, teachers were included in three groups: 1: do not currently teach any child with ADHD (26 participants); 2: teach a child with presumed ADHD, not diagnosed (44 participants); 3: teach a child diagnosed with ADHD (88 participants). In these groups, the level of knowledge about ADHD as measured by the KADDS scale is the lowest for those who do not teach any children with ADHD (57.1%) and the highest average value of the knowledge surveyed is for those who also teach children diagnosed with ADHD (63.9%). The difference between the average values of these two groups is significant according to the ANOVA analysis of variance and Tukey'b post-test (F= 4.255, p=0.016).

On the basis of whether the respondents had already taught children with ADHD, we formed four groups of teachers (1: no /25 persons/; 2: yes, but rarely /31 persons/; 3: yes, fewer than 5 children /47 persons/; 4: yes, more

than 5 children/55 persons/). The differences between these groups with regard to knowledge about ADHD were not significant according to the results of the ANOVA analysis of variance (F=1.693, p=0.171); however, the average values of group 4 were the highest (F=1.693, p=0.171) in each case. They have considerable own experience in teaching children with ADHD. Since the average values showed a similar pattern across the groups, group 4 was compared with the other groups using a two-sample t-test. The results of the two-sample t-test revealed a significant difference in the levels of knowledge when teachers had significant experience, i.e. If they had taught more than 5 children with ADHD. Cohen's d effect size value is d=0.37, indicating a detectable, moderate difference (see Figure 2).

Table 2. Mean values and standard deviations of knowledge levels measured by the KADDS questionnaire and its sub-scales in the present sample.

Sub-scale		Average (%)	Deviation (%p)
G (15 items)	General information about the nature, causes and prognosis of ADHD	58.2	15.6
S (9 items)	Symptoms, the diagnosis of ADHD	78.6	15.7
T (12 items)	Treatment of ADHD	56.2	17.2
KADDS questionnaire		62.5	12.9

Teachers with significant experience, i.e. those that have taught at least 5 children with ADHD while working as teachers, scored higher on the scale as a whole. The difference between averages is significant (F=4.312, p=0.039; t=2.459, p=0.015).

Based on whether the respondents had a child diagnosed with ADHD in their family or close neighborhood, two groups were created: 1: none (102) and 2: yes (56). As regards the general level of knowledge as measured by KADDS, according to the two-sample t-test, the result for part sample 'None' is significantly weaker than the result for part sample 'Have' (KADDS: F=4.071, p=0.045, t=-3.713, p<0.001). Cohen's D effect size 0.56, which indicates a meaningful, moderate difference. Thus, those who have children diagnosed with ADHD in their immediate environment or neighbourhood have significantly more knowledge about ADHD as measured by the KADDS scale than those who don't.

Background Variables for In-service Training Courses

Based on the number of hours of in-service training, three groups of the respondent teachers are analyzed: 1: no in-service training related to ADHD (66); 2: fewer than 40 hours of in-service training (42); 3: more than 40 hours of in-service training related to or a degree in ADHD (50).

Based on the ANOVA analysis of variance and Tukey's post-test, those who had no in-service training scored significantly lower on the KADDS questionnaire than those who had in the form of either a short or a long course ($F= 18.798$, $p<0.001$). The differences between the average values of the groups created based on these variables were the most marked. When dividing respondents into two groups—those who 'had not participated in in-service training' and those who 'had participated in in-service training'—the difference in total KADDS scores exceeded 10%. Specifically, the mean percentage of correct responses was 55.9% for those without in-service training and 67.3% for those with in-service training. The corresponding Cohen's d value was 0.979, indicating a very large effect size between the two group means.

Background Variables Pertaining to the Working Environment

There were no significant differences between the average values of ADHD-related knowledge of the groups as measured by the KADDS scale by settlement type (capital city /59 persons/, county /34 persons/city or town 47 persons/, village /18 persons/) (ANOVA results $F=2.577$, $p=0.094$) where the respondents' place of work is.

Based on whether an ADHD specialist was available where respondent teachers work four groups were formed: 1: No (49 persons); 2: Don't know (5 persons); 3: Available but had not yet consulted them (27 persons); 4: Available and had already consulted them (77 persons). The ANOVA analysis of variance revealed no significant differences between these groups' levels of knowledge about ADHD as measured by the KADDS scale. However, the reason for wording the question and providing the response options was to clearly identify teachers who had had the opportunity to seek support from an ADHD professional with their work and those who had chosen not to do so. Therefore, a two-sample t-test is used to compare the average values of the general knowledge levels of those in these two part-samples as measured by the KADDS questionnaire.

The knowledge of the teachers across the KADDS questionnaire and its sub-scales who took the opportunity to seek the support of an ADHD specialist available at work is significantly higher (64.7%) than that of the teachers who did not though they had had the opportunity to do so (57.1%). The average values are significantly different ($F=7.817$, $p=0.006$; $t=-2.135$, $p=0.040$). The differences are moderate, but significant, Cohen's $d = 0.60$.

Regarding whether the school where the respondent teacher works organizes ADHD-related training, no differences in the average values of the teachers' knowledge as measured by the KADDS questionnaire were found (1: Does not organize /107 persons/; 2: Rarely organizes /40 persons/; 3: Organizes more

than once /11 persons/), nor were any differences identified with the ANOVA analysis of variance in the case of sub-scales. Two-sample t-tests run after Groups 1 and 2 and Groups 2 and 3 had been merged did not indicate significant differences in the indicators tested, either. The second test examines whether in-service training has any detectable effect, and the first one examines whether regular in-service training has a detectable effect on the knowledge items of the teachers tested. Statistics show that there is no effect in either case.

Neither the ANOVA analysis of variance nor the two-sample t-tests revealed any significant differences between the knowledge levels measured with the complete KADDS questionnaire of the groups formed on the basis of the background variables generated on the basis of the additional questions in the background questionnaire on the work environment (Can you ask your colleagues for advice on ADHD? If you have difficulty with a child diagnosed with ADHD, do you share this with your colleagues? Are there any organized opportunities for case conferences or supervision in the institution?). It follows then that these parameters do not affect the measured knowledge levels significantly.

The Complex Impact of the Background Variables Examined on the Level of Knowledge Examined

Regression Analysis of the KADDS Total Score

Model 1. Including all relevant (12 independent) variables of the background variables studied, and using a linear regression model, we examined the KADDS total score as a dependent variable ($F=3.583$, $p<0.001$). The overall explanatory power of the model was 22.9 per cent ($R2=0.229$).

Table 3 shows the four background variables the absolute value of the effect of which is above 1 per cent. It is safe to say that the other eight variables included in the model have no effect on the dependent variable in this model. The combined explanatory power of the four variables is 23.5 per cent. This is a higher value than the total explanatory power of the model (22.9%) because the effects of the 8 variables that had not been included. included values ranging between 0 and -1.

Model 2. Retaining the four variables with an effect greater than 1 per cent in the previous model, and using a linear regression model, we examined the total KADDS score as a dependent variable ($F=10.571$, $p<0.001$). The overall explanatory power of the model was 21.7 per cent ($R2=0.217$) (Table 4).

Table 3. Regression analysis of the KADDS total score – model 1

Background variable	r	ß	Effect (r*ß*100)	p
Have you attended any training in ADHD?	0.387	0.365	14.1	0.001
Is there a child or an adult diagnosed with ADHD in your family or among friends, peers or acquaintances?	0.262	0.190	5.0	0.018
Location of respondent's workplace	0.182	0.140	2.5	0.073
Do you currently teach a child diagnosed with ADHD?	0.201	0.093	1.9	0.237
Total explanatory power (R2*100) =			22.9	

Table 4. Regression analysis of the KADDS total score – model 2.

Background variable	r	ß	Effect (r*ß*100)	p
Have you attended any training in ADHD?	0.387	0.333	12.9	0.000
Is there a child or an adult diagnosed with ADHD in your family or among friends, peers or acquaintances?	0.262	0.185	4.9	0.014
Location of respondent's workplace	0.182	0.125	2.3	0.086
Do you currently teach a child diagnosed with ADHD?	0.201	0.082	1.6	0.277
Total explanatory power (R2*100)			21.7	

In Model 2, variables related to in-service training and having a person diagnosed with ADHD among relatives, peers, friends or acquaintances continue to have a significant effect. It is safe to say that, regarding the background variables examined, these two variables exert dominant influence on the level of knowledge measured by the KADDS questionnaire.

Model 3. The two variables with a significant effect in the previous model (in-service training and having a person diagnosed with ADHD among relatives, peers, friends or acquaintances) are considered as explanatory variables, and the KADDS total score remains the dependent variable. The aim of this model is to determine the proportion of the effect of the two variables as precisely as possible. The model is significant ($F=18.597$, $p<0.001$) with an overall explanatory power of 19.4 per cent ($R2=0.194$) (Table 5).

Table 5. Regression analysis of the KADDS total score – model 3.

Background variable	r	ß	Effect (r*ß*100)	p
Have you attended any training in ADHD?	0.387	0.357	13.8	0.000
Is there a child or an adult diagnosed with ADHD in your family or among friends, peers, or acquaintances?	0.262	0.212	5.6	0.004
Total explanatory power (R2*100)			19.4	

The results of the model show that regarding the two background variables, both exerting a significant effect, it is the variable describing the length of ADHD-related training that has a larger proportion of the explanatory power. In addition, the effect of having a person diagnosed with ADHD in the family or among friends, peers or acquaintances is significant, but to a lesser extent.

Thus, it is the number of hours of training and knowing a person diagnosed with ADHD in the family or among friends, peers or acquaintances that are the background variables with a significant effect in the regression models. Figure 5 enables us to examine the ADHD-related knowledge as measured by the KADDS scale of the 6 groups created in accordance with the breakdown established by a cross-tabulation containing these two background variables. Presumably, we have thus found, from among the part-samples outlined by means of background variables, the groups with the lowest level of knowledge (no training in ADHD and nobody diagnosed with ADHD in the family or among friends, peers or acquaintances: 52.6%) and the one with the highest level of knowledge (participated in ADHD-related training and knowing a person diagnosed with ADHD in the family or among friends, peers or acquaintances: 71.2%).

DISCUSSION

Teachers' General Knowledge About ADHD

This study examines teachers' ADHD-related knowledge. The general knowledge level of teachers measured by the KADDS scale is 62.5%, which is in the upper category of knowledge level identified in international studies (see Table 1).

This result is similar to the ADHD knowledge level of teachers as measured by the KADDS scale in, for example, the United States (Sciutto et al., 2016) or South Korea (Lee et al., 2020).

The knowledge level that we measured is lower than, for example, the knowledge level of Spanish (Cueli et al., 2022) and Canadian (Blotnicky-Gallant et al., 2015) teachers.

The teachers in our study scored higher on the KADDS scale than teachers in Vietnam (Sciutto et al., 2016), Saudi Arabia (Sciutto et al., 2016), Greece (Galanis et al., 2021; Sciutto et al., 2016), Iraq (Sciutto et al, 2016), New Zealand (Dilaimi, 2013), Kenya (Kablra, 2012), South Texas, USA (Guerra & Brown, 2012), Saudi Arabia (Alshammari, 2020), Egypt (Al-Moghamsi et al., 2018), Spain (Jarque Fernández et al., 2007) or South Africa (Perold et al., 2010).

Although Hungarian teachers' knowledge of ADHD is among the higher in international comparisons, it is still considered moderate, and educational interventions are needed to increase this level of knowledge in Hungary.

Age and Knowledge About ADHD

The influence of age on teachers' knowledge of ADHD remains a subject of debate in the literature. Safaan et al. (2017) found that an increase in age was associated with an increase in teachers' knowledge of ADHD, but Hosseinnia et al. (2020) found the opposite in their research. Their research has revealed that the younger generation of teachers usually holds a degree from an institution of higher education, with a higher proportion having completed a master's or doctoral degree than older teachers. The higher level of knowledge about ADHD observed among younger teachers may be attributed to their more recent educational attainment (Safaan et al., 2017; Yussef et al., 2015; Perold et al., 2010). Conversely, older teachers possess greater professional experience, which may in turn be associated with enhanced knowledge regarding ADHD (Al-Moghamsi & Aljohani, 2018; Safaan et al., 2017; Sciutto et al., 2000). In our survey, respondents aged 22–35 years of age scored significantly higher on the KADDS scale than those aged 36–45 years of age. Also, members of the oldest age group have more knowledge about ADHD, especially in terms of symptom recognition and practical methods. In other words, the results of our sample support both assumptions and highlight the need to support the middle generation.

Number of Years Spent the Teaching Profession

In line with previous international research (Aly et al., 2015; Alfageer et al., 2018; Saad et al., 2022), the results of our present study show that the number

of years spent teaching is not interconnected with the level of knowledge about ADHD.

Previous or Current Teaching Experience with Children Diagnosed with ADHD. International research has produced conflicting results on the impact of previous or current teaching experience with children diagnosed with ADHD on ADHD-related knowledge levels. Nasr et al. (2024) and Farag et al. (2024) have found no significant connection between previous experience and ADHD-related knowledge levels, contradicting the findings of Alfageer et al (2018) and Saad et al (2022), who have found that having taught children with ADHD either in the past or currently has a positive effect on teachers' ADHD-related knowledge levels. Our study has found that teachers who are currently also teaching children with an ADHD diagnosis have the highest level of ADHD-related knowledge. As regards the role of prior teaching experience, there is a significant difference in the level of knowledge about ADHD according to whether teachers have significant experience, i.e. whether they have taught more than 5 children with ADHD.

Children Diagnosed with ADHD in the Teacher's Family or Among Their Friends

In a study conducted in 9 countries, Sciutto et al. (2016) found that teachers who had a family member, a friend, a peer or an acquaintance diagnosed with ADHD had higher levels of ADHD-related knowledge. Such close relationship is likely to provide them with relevant knowledge about symptoms, diagnoses and treatments. In addition, research on the stigmatization of individuals with ADHD has consistently identified personal (emotional) involvement as an effective component of interventions (Corrigan et al., 2012). Corroborating these data, our survey also confirms that teachers in whose family there are children diagnosed with ADHD, or who have friends, peers or acquaintances diagnosed with ADHD have significantly higher levels of ADHD-related knowledge than those in whose family or among whose friends, peers or acquaintances there are no such persons.

In-Service Training

International research has shown that ADHD training is effective because teachers' knowledge about ADHD increases after training (Jones & Chronis-Tuscano, 2008; Ward et. al, 2022; Zentall & Javorsky, 2007), which usually leads to more positive attitudes towards affected children (Cueli et. al, 2022). In Sciutto's (2016) cross-national study of 9 countries, the connection between

knowledge and training was found to be modest, which is consistent with other previous studies (Sciutto et al, 2000; Kos et al, 2004; Jarque Fernández et al, 2007; Jones & Chronis-Tuscano, 2008; Perold et al, 2010). In contrast, in a study by Mohr-Jensen et al (2019), the strongest predictor of accurate knowledge was postgraduate education in ADHD.

The results of our study suggest that there is a significant difference in the level of knowledge about ADHD between teachers who have attended relevant postgraduate training compared with those who did not.

Work Environment

In our study, the only background data on the work environment that was significantly interconnected with ADHD knowledge levels as measured by the KADDS scale was whether or not teachers have used the services of an ADHD specialist 'available' at the workplace. We hypothesize that this may be since teachers who visit a specialist is interested in ADHD in the first place, believe that the proper education of the children concerned is important, and therefore, and use other sources to receive information. While teachers whose school employs an ADHD specialist, but who do not consult them, are presumably less interested in ADHD and they may not teach affected children.

The two background variables with significant effects according to the regression analysis are participation in in-service training and social involvement. From among the part-samples outlined by means of background variables, the group with the lowest level of knowledge was the one whose members had had no training in ADHD or had nobody diagnosed with ADHD in the family or among friends, peers or acquaintances (52.6%), and the group with the highest level of knowledge was the one whose members had participated in ADHD-related training and had a person diagnosed with ADHD in the family or among friends, peers or acquaintances (71.2%).

Limitations

Our study has several limitations. Given the fact that we collected data using the snowball method, the research is not representative of the Hungarian teaching profession as a whole. We used a self-administered questionnaire to map teachers' knowledge about ADHD, which may, therefore, result in biased information. Finally, there may be a number of demographic, educational, personal and workplace determinants of teachers' knowledge of ADHD, and we were able to investigate only a few.

CONCLUSIONS

The results of our research suggest that the level of knowledge about ADHD is the most strongly influenced by two factors: a close personal relationship with a child diagnosed with ADHD and high number of (more than 40-) hours of ADHD-related or tertiary-level training.

An early diagnosis is essential to ensure that children with ADHD receive the right support. Teachers are usually the first professionals who are likely to notice the characteristics of ADHD in children, and hence, are in a position to refer them to an appropriate specialist. In addition, teachers are the ones who spend the most time with children, so their methodological training is essential. Teachers, therefore, need to have the appropriate ADHD knowledge to understand this condition, provide appropriate support in the classroom, and have a positive attitude towards the children concerned. The knowledge-enhancing role of a personal relationship suggests that it is worth involving people diagnosed with ADHD and their families in educational and research issues.

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The Research Ethics Committee of the Faculty of Education and Psychology, Eötvös Loránd University granted ethical approval for the research (Approval Number: 2022/628-2). All participants gave their informed consent prior to participation. Data collection and handling were carried out in full compliance with relevant ethical standards and data protection regulations.

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