

Differences in identification of attention deficit hyperactivity disorder in children between teachers and parents

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Abstract

Background: The worldwide prevalence estimates for attention deficit hyperactive disorder (ADHD) are extremely heterogeneous. Diagnosis in children demands symptoms be present in at least 2 different settings, mainly school and home. The proportion of children estimated to have ADHD can vary based on whether the symptoms are evaluated by parents or teachers.

Aims: This study determined whether ADHD and its subtypes are better recognized by parents or teachers.

Methods: Our study included 1326 schoolchildren (boys = 712, girls = 614; age range: 6–12 years). We prepared 2 questionnaires for each student enrolled in the study; one was completed by the student's parents and the other by the teacher. We included students who attended 3 selected schools in the cities of Amman and Karak in Jordan during the first term of 2017. The Arabic version of the Diagnostic and statistical manual of mental disorders, 4th edition, was used for the diagnosis and classification of ADHD.

Results: Of the 1326 students included in this study, 254 (19.2%) were considered to have ADHD by the teachers and 172 (13.0%) by the parents. The Wilcoxon signed-ranks test showed that teachers gave statistically higher scores on the questionnaire than parents. However, overall agreement between parents and teachers, as measured by the κ -value, reached 77.2%.

Conclusions: Although both teachers and parents recognized ADHD symptoms, they were generally more recognized by teachers than by parents.

Keywords: ADHD, Jordan, students, symptom recognition

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Introduction

Attention deficit hyperactivity disorder (ADHD) is the most common neurobehavioral disorder among children. Estimates of the worldwide prevalence of ADHD are extremely heterogeneous (1), ranging from 2.2% to 17.8% (2). According to the American Psychiatric Association, however, 5% of children have ADHD (3). An overall pooled prevalence estimate of 7.2% was reported in a 2015 meta-analysis of 175 studies (4).

Previous research has provided various explanations of the variations among estimations of ADHD prevalence (5). It has been suggested that ADHD is an over-diagnosed and over-treated condition, citing as evidence the rise in parent-reported diagnosis from 6.9% in 1997 to 7.8%, 9.5% and 11% in 2003, 2007 and 2011 respectively (6,7). The debate on diagnosis and treatment continues among medical professionals, parents, and educational authorities (8–10).

As ADHD symptoms typically affect school performance and disrupt class, teachers are often the first to suggest that a child may have the condition (11). This may also be attributable to the fact that teachers observe children on most days for several months of the year.

As children are usually unable to reliably report their own behaviour, confirming a supposition of ADHD requires not only examining the child in question but

also interviewing parents and obtaining data from the school. Some studies have demonstrated that the correlation between parents' and teachers' reports is only modest (12). Further, assessments made by the 2 parties have been shown to often disagree on the subtype classification (13). Thus, acquiring information from only 1 source (i.e. parents or teachers) strongly influences the apparent prevalence of the disorder (14).

To the best of our knowledge, the first evaluation of ADHD prevalence in Jordan was conducted in 2010 (15). The current study aimed to assess whether the symptoms of ADHD among students are better recognized by parents or by teachers.

Methods

This cross-sectional study included all students aged 6–12 years (1st through 6th grades) from 3 different schools that were selected because of their diverse student population: half came from rural areas and half from urban areas. The required sample size based on Kish's formula was 164; however, all eligible students were included in this study for increased reliability and to simplify the randomization task. Of the 1390 eligible students, 64 were excluded because of a lack of parental response. The first school, accounting for 621/1326 students, was in Am-

man, the capital of Jordan. The school psychologist sent out and collected the questionnaires from students' parents and teachers. The other 2 schools were in Karak city, 120 km south of Amman, with 233 students in one (co-educational official school) and 472 in the other (university campus school), a total of 705 students. In the Karak schools, the study aim was explained to teachers and parents and questionnaires were distributed and collected by the staff of Queen Rania Centre for Childhood Studies at Mutah University. Screening and data collection were performed from the beginning of the first semester in the academic year 2016–2017. Parents and teachers used the Arabic version of the DSM-IV rating scale for the diagnosis and classification of ADHD (3). This tool contains 18 items: the first 9 assess attention deficit symptoms and the next 9 assess hyperactive-impulsive symptoms. Each item is rated by selecting 1 of 4 possible answers, "never," "rarely," "often," or "very often." Students who obtain positive scores for at least 6 items (i.e. "often" or "very often" ratings) for attention deficit are considered positive for the attention deficit (AD) subtype and those who obtain positive scores for 6 or more of the items that assess hyperactivity and impulsiveness are considered positive for the hyperactive-impulsive (HI) subtype. If students obtain positive scores for 6 of both types of items, they are considered positive for the combined subtype.

Ethical approval was obtained from the Faculty of Medicine, Reference No. 201820, and further approval was obtained from Mutah University through the Queen Rania Centre for Childhood Studies. Written informed consent was obtained from all parents.

Data analysis was performed by using SPSS, version 16. A simple frequency table was used to display the number and percentage of ADHD subtype occurrences. Cohen's kappa coefficient (κ) was used to measure agreement between the 2 raters (i.e. parent and teacher). A paired analysis was also performed; given that the data were not distributed normally, a Wilcoxon signed-ranks test was used rather than a paired t-test. The level of significance was set at $P < 0.05$.

Results

This study included a total of 1326 students (712 boys, 614 girls), of whom 254 (19.2%) and 172 (13%) were considered to have ADHD by teachers and parents, respectively. The boy:girl ratio was nearly 1:1. The ratios in both the co-educational school in Amman and the university campus school in Karak were both 1:1.2, and the ratio in the last school was 1.8 to 1. The mean age was 9.0 (standard deviation 2.6) years. The proportions of ADHD subtypes (AD, HI, and combined) in the study population were 7.3%, 7.8%, and 4.2% respectively. These proportions were significantly higher than those reported by the parents (4.5%, 6.4%, and 2.1%, respectively). Therefore, it is evident that teachers were better than parents at recognizing ADHD symptoms and the corresponding subtypes (Table 1). Table 2 shows the results of the Wilcoxon signed-ranks test. It can be seen that for

Table 1 Prevalence of attention deficit hyperactive disorder (ADHD) and subtypes among the study population (n = 1326 schoolchildren) as identified by teachers and parents

Subtype	Teachers		Parents	
	No.	%	No.	%
Attention deficit	97	7.3	60	4.5
Hyperactive-impulsive	103	7.8	85	6.4
Combined	54	4.2	27	2.1
ADHD	254	19.2	172	13.0

all types of ADHD, teachers assigned children significantly higher scores than their parents ($P < 0.001$ for all 3 subtypes). Similar results were found when the data were analysed by sex.

Table 3 shows the overall agreement between teacher and parent responses. Concordance was high ($\kappa = 0.772$). The HI subtype featured the highest agreement between the 2 parties (89.7%), followed by AD (75%) and the combined subtype (66.5%).

Discussion

Despite ADHD being one of the most common and well-studied neurodevelopmental and psychiatric disorders in the paediatric population (16), its prevalence remains controversial. The wide variability in prevalence estimates confounds evaluations of the public health impact of ADHD. Thus, accurate prevalence data and improved estimates are needed to determine whether the incidence of ADHD is increasing or it is merely being detected more effectively.

Some of the variability in prevalence estimates can be attributed to differences in study methods; for example, some prevalence studies using population samples have relied on information obtained from parents (17), while others have used data provided by teachers (18). Few surveys have collected reports from both parents and teachers.

However, disagreement occurs not only between teachers and parents but also between the parents themselves. As clinically evidenced by studies examining parental agreement on broadband rating

Table 2 Wilcoxon signed ranks tests of teachers' vs parents' ratings for attention deficit hyperactive disorder (ADHD) subtypes

ADHD subtype	Rank	Z-value	P
Attention deficit: teacher-parent	Negative: 641 Positive: 439 Tied: 246	-4.21	< 0.001
Hyperactive-impulsive: teacher-parent	Negative: 763 Positive: 398 Tied: 165	-8.93	< 0.001
Combined: teacher-parent	Negative: 737 Positive: 456 Tied: 133	-7.75	< 0.001

Ranks were obtained from questionnaire scores. The number of negative ranks equals the number of teachers who gave higher scores than their parent counterparts and vice versa.

Table 3 Agreement between teachers' and parents' ratings of attention deficit hyperactive disorder (ADHD) and ADHD subtypes

Agreement		Teachers	
		Yes	No
Overall agreement for ADHD			
Parents	Yes	172	0
	No	82	1067
Kappa = 0.772; SE kappa = 0.024; 95% CI: 0.726–0.819			
Attention deficit agreement			
Parents	Yes	60	0
	No	37	1224
Kappa = 0.750; SE kappa = 0.039; 95% CI 0.674–0.827			
Hyperactive–impulsive agreement			
Parents	Yes	85	0
	No	18	1218
Kappa = 0.897; SE kappa = 0.024; 95% CI: 0.850–0.944			
Combined subtype agreement			
Parents	Yes	27	0
	No	27	1267
Kappa = 0.665; SE kappa = 0.060; 95% CI: 0.548–0.783			

SE = standard error; CI = confidence interval.

scales, such as DSM-based ADHD symptom-specific ratings, mothers and fathers often disagree in their ratings of child behaviour (19).

Some studies have shown that parent and teacher ratings of ADHD behaviours are only weakly to moderately correlated (20). A study from Australia posited that low parent–teacher agreement may indicate that ADHD symptoms are situation-specific (21). In contrast, when ADHD symptoms are treated, parent- and teacher-based ratings of symptom change are in high agreement (22). The estimated prevalence of ADHD in our study population was higher than expected based on international studies.

In evaluating ADHD symptomatology, it is important to obtain independent reports concerning the child's behaviour at school and home (23). We consider the most important strength of our study to be its population-base, which allowed us to screen almost the entire student population in grades 1 through 6 from 3 different schools, and from urban as well as rural areas. There have been only a few studies on ADHD and its subtypes in Jordan. A recent study reported the prevalence to be 20.21% (24), which is similar to our findings obtained from teachers.

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Further, our study is among the few to have examined differences between parents and teachers in how they report ADHD symptoms. Our results demonstrate that teachers recognize both ADHD symptoms and subtypes significantly better than parents.

The agreement between parents and teachers was greatest for the HI subtype. The fact that hyperactivity is easily observed in the classroom setting may account for the high agreement.

The current criteria for the diagnosis of ADHD include onset before age 7 years, persistence of symptoms for more than 6 months, presence of symptoms in 2 settings (home and school), and behaviour-rating scales describing home and school functioning. The first step is the parent interview. This should include presenting problems, developmental history and family history. By combining such information, the clinician can reliably perform the diagnosis. Up to now, there are no laboratory or radiological tests for specifically diagnosing ADHD. In future, genetic tests may be developed to ensure greater specificity of the diagnosis. The novelty of this study lies not only in comparing the awareness of parents and teachers regarding the symptoms but also in highlighting the recognition of the subtypes and comparing the evaluation of parents and teachers for each of the subtypes.

A limitation of this study is that it only covered 2 areas of Jordan and was thus not representative of the entire Jordanian population. Moreover, none of the children were interviewed, and since no family history was collected, it is not known whether any of these children were receiving medical advice or treatment for ADHD. It is also not known whether the questionnaire for each student was completed by the mother, father, or both.

This study highlights the importance of teachers' evaluations for the diagnosis of ADHD. We recommend organization of specialized workshops for school teachers to educate them regarding ADHD and to guide them as to when the students should be referred for further medical evaluation or psychological advice, particularly to manage those students who have failed in school or exhibit learning difficulties.

Conclusions

Although both parents and teachers are able to recognize ADHD symptoms, there was a significant difference between the estimations of ADHD prevalence made by the 2 groups: teachers demonstrated a significantly better ability to recognize these symptoms.

Identification du trouble déficitaire de l'attention avec hyperactivité chez l'enfant : différences entre les enseignants et les parents

Résumé

Contexte : Les estimations de la prévalence mondiale du trouble déficitaire de l'attention avec hyperactivité (TDAH) sont extrêmement hétérogènes. Chez l'enfant, le diagnostic ne peut être établi que si les symptômes sont présents dans au moins deux environnements différents, généralement l'école et la maison. La proportion d'enfants considérés comme ayant un trouble déficitaire de l'attention avec hyperactivité peut varier en fonction de la personne qui évalue, à savoir les parents ou les enseignants.

Objectifs : La présente étude a permis de déterminer qui, des parents ou des enseignants, reconnaît mieux le TDAH et ses sous-types.

Méthodes : Notre étude a porté sur 1326 écoliers (garçons = 712, filles = 614 ; groupe d'âge : 6-12 ans. Nous avons mis au point deux questionnaires pour chaque élève participant à l'étude ; un à remplir par les parents de l'élève et un autre par l'enseignant. L'échantillon se composait d'élèves scolarisés dans trois écoles sélectionnées, situées dans les villes d'Amman et de Karak (Jordanie), au cours du premier trimestre de 2017. La version en langue arabe de la quatrième édition du Manuel diagnostique et statistique des troubles mentaux a été utilisée pour le diagnostic et la classification des cas de TDAH.

Résultats : Sur les 1326 élèves examinés dans le cadre de cette étude, 254 (19,2 %) ont été considérés comme ayant un TDAH par les enseignants et 172 (13,0 %) par les parents. Le test des rangs signés de Wilcoxon a révélé que les enseignants donnaient des scores statistiquement plus élevés que les parents dans le questionnaire. Cependant, la concordance globale entre les estimations des parents et des enseignants, telle que mesurée par la valeur de l'index Kappa, a atteint 77,2 %.

Conclusions : Les enseignants et les parents reconnaissent tous les deux les symptômes du TDAH, mais les enseignants repèrent généralement plus souvent ces signes que les parents.

أوجه التباين بين المدرسين والآباء في تحديد اضطراب نقص الانتباه مع فرط النشاط في الأطفال

عمر نافع، عوني شاهين، أحمد طراونه، زيد سمحان

الخلاصة

الخلفية: يوجد تباين كبير للغاية بين تقديرات انتشار الإصابة «باضطراب نقص الانتباه مع فرط النشاط» على مستوى العالم أجمع. ويتطلب تشخيص الأطفال بإصابتهم بهذا الاضطراب ظهور أعراضه عليهم في محيطين مختلفين على الأقل، وهما المدرسة والمنزل. وقد تختلف نسبة الأطفال المقدر إصابتهم «باضطراب نقص الانتباه مع فرط النشاط» استناداً إلى ما إذا كان الآباء أم المدرسون هم من يقومون بتقييم الأعراض.

الأهداف: هدفت هذه الدراسة إلى تحديد ما إذا كان الآباء أم المدرسون هم الأقدر على التعرف بصورة أفضل على اضطراب نقص الانتباه مع فرط النشاط وأنواعه الفرعية.

طرق البحث: شملت الدراسة 1326 تلميذاً من تلاميذ المدارس (الفتيان = 712، والفتيات = 614؛ وتراوح أعمارهم بين 6-12 عاماً). وأعد استبيانان لكل تلميذ من التلاميذ المشاركين في الدراسة؛ أحدهما تُستكمل بياناته بواسطة الأبوين، والآخر تُستكمل بياناته بواسطة المدرسين. وتضمنت الدراسة التلاميذ الذين كانوا يدرسون في 3 مدارس مُختارة في مدينتي عمان وكرك في الأردن خلال الفصل الأول من عام 2017. وقد استُخدمت الطبعة الرابعة من النسخة العربية للدليل التشخيصي والإحصائي للاضطرابات النفسية في تشخيص «اضطراب نقص الانتباه مع فرط النشاط» وتصنيفه.

النتائج: من بين التلاميذ الذين شملتهم الدراسة وعددهم 1326 تلميذاً، حدد المدرسون والآباء نسبة التلاميذ المصابين «باضطراب نقص الانتباه مع فرط النشاط» بما يبلغ 254 تلميذاً (19.2%) و172 تلميذاً (13.0%)، على التوالي. وأظهر اختبار ويلكوكسن للمرتبة والمجموع أن المدرسين قد أحرزوا درجات أعلى من الآباء في الاستبيان من الناحية الإحصائية. وعلى الرغم من ذلك، بلغت نسبة التوافق العام بين الآباء والمدرسين حوالي 77.2%، حسب قياس معامل كبا.

الاستنتاجات: على الرغم من أنه بإمكان كل من المدرسين والآباء التعرف على أعراض «اضطراب نقص الانتباه مع فرط النشاط»، إلا أن المدرسين بصفة عامة كانوا أقدر من الآباء على التعرف على هذه الأعراض.

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