

# Prevalence of Attention Deficit Hyperactive Disorder (ADHD) in School Children in Al-Qaser District Jordan

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## Abstract

**Objectives:** To determine the prevalence of Attention Deficit Hyperactive Disorder (ADHD), its subtypes, its effects on learning and some of its associations in Al-Qaser district in South Jordan.

**Design:** School-based screening study.

**Study Population:** All school children aged 6-12 years (both males and females) in Al-Qaser district in South Jordan were screened.

**Methods:** The inclusion criteria comprised hyperactivity, impulsivity, inattention, learning difficulties, and failure in school exams. The Arabic version of the fourth edition of Diagnostic and Statistical Manual (DSM-IV) for the diagnosis and classification of ADHD questionnaire was applied to all the students included in the study.

**Results:** A total of 4374 students were screened, out of which 273 cases were positive, showing a prevalence of 6.24%. Furthermore, the prevalence was 9% among school boys and 3.7% among school girls, with a male to female ratio of 2.4:1. Learning difficulties were as follows: 59.3% for mathematics and 53.1% for language, and the consanguinity was observed in 34.8% of the cases.

**Conclusions:** Prevalence of ADHD in Jordan was found to be within the international values, and the male to female ratios was observed to be high in the whole group as well as in all the subtypes. Furthermore, association with learning difficulties was observed to be very strong and the incidence of consanguinity was found to be very high.

**Keywords:** ADHD, Prevalence, Jordan.

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## Introduction

Attention Deficit Hyperactive Disorder (ADHD) is a common neurobiological condition affecting 5-8% of school-going children (DSM IV 4<sup>th</sup> ed., text, and revision).

A lot of studies have been carried out about the prevalence of ADHD in children. The Mayo Clinic studies use 7.5%. (Mayo Clinic, 2001), according to American academy approximately 7% of children ages 6-11 had AD/HD (with or without a learning disability) (American Academy of Pediatrics, 2000).

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The National Institute of Mental Health (NIMH) periodically publishes, "The Numbers Count: Mental Disorders in America." The 2001 version of this publication states that, ADHD is one of the most common mental disorders in children and adolescents.

The 1999 Report of the U.S. Surgeon General on Mental Health Report states that 3-5% of school age children have AD/HD.

Also, there is a growing interest in estimating prevalence of ADHD in adults which is approximately 4% (Faraone; Biederman; & Mick, 2006), (Kessler; Adler; Barkley; Biederman, et al. 2006).

ADHD is characterized by developmentally inappropriate levels of inattention, impulsivity, and hyperactivity.

In the fourth edition of the Diagnostic and Statistical Manual (DSM-IV) classification system, the disorder has been renamed as attention-deficit/hyperactivity disorder or AD/HD. The current name reflects the importance of the inattentiveness characteristics as well as the other characteristics of the disorder, such as hyperactivity and impulsivity. AD/HD has three subtypes: Predominantly hyperactive-impulsive, predominantly inattentive, and combined hyperactive-impulsive and inattentive.

Numerous studies have been conducted to determine the cause of this disorder. Research has clearly indicated that AD/HD tends to run in families, and that the patterns of transmission are to a large extent genetic (Tannock, 1998; Swanson, & Castellanos, 2002).

To our knowledge, no studies regarding the prevalence of AD/HD in Jordanian school children have been carried out. Also, the studies related to the prevalence of this disorder have been very scanty in the Middle East region so far.

## Objectives

The aims of this study are to determine the prevalence of this disorder and its subtypes, male to female ratio, the effect of this disorder on school performance, language impairment, difficulty in mathematics, and other associations like consanguinity, epilepsy, and head trauma.

## Materials and Methods

The screening was done through teacher's questionnaire, and no clinical procedure or test was carried out on these students. Consent was obtained from educational authorities through a formal letter from the university, and parents were informed about it by the principal of each school. A group of trained social workers visited all the public schools in the district and explained the aims and methods of the study to the teachers and helped them fill the questionnaires. The teachers accepted this work and collaborated well. The teachers applied the questionnaire to all the children who met the inclusion criteria.

The study included all school children in Al-Qaser, a district which is part of Karak province in South Jordan, which has homogeneous population as well as urban and suburban areas.

Both male and female children from the first to the sixth school grades (aged 6-12 years) were investigated. An Arabic version of a questionnaire designed according to the DMS-IV criteria for diagnosis and classification of ADHD was used (Figure 1). The questionnaire was filled by school teachers for each student having the inclusion criteria of hyperactivity, inattention, and impulsivity, as well associations of this disorder such school failure, learning difficulties especially in language and mathematics. For each student, the questionnaire also included age, sex, consanguinity (first cousin parents).

***Teacher's Evaluation Form: Kindly fill the evaluation form based on the child's behavior during the last months.***

	<u>Never</u>	<u>Rarely</u>	<u>Often</u>	<u>Very often</u>
1- Often fails to pay close attention or makes careless mistakes.				
2- Has trouble keeping attention focused when playing or working.				
3- Has trouble to listen when spoken to directly.				
4-Has trouble in following instructions and fails to finish schoolwork or duties.				
5- Has problems organizing tasks and activities.				
6- Avoid participating in tasks that require mental efforts.				
7- Loses things necessary for tasks or activities.				
8- Easily distracted by external factors.				
9- Forgetful in daily activities.				

	<u>Never</u>	<u>Rarely</u>	<u>Often</u>	<u>Very often</u>
1- Fidget with hands or feet or squirms in his/her seat.				
2- Leaves the seat when he/she is not supposed to.				
3-Runs or climbs excessively in conditions considered inappropriate.				
4-Has trouble playing or doing leisure activities quietly.				
5- Always on the go acts as "driven by a motor".				
6- Talks too much.				
7- Gives answers to the questions before the questions are completed.				
8- Has trouble waiting in line or taking turns with others.				
9- Interrupts others when they are working or playing.				

**Figure (1): Teacher's questionnaire contains two sets of questions: the first nine questions are criteria for attention deficient.**

The second nine questions are criteria for: hyperactive impulsive behavior.

If the child's score is more than six out of nine for "often" and "very often" from the first set, and less than six from the second set, then we can consider him/her to come under inattentive subtype.

If the child's score is more than six out of nine for "often" and "very often" from the second set of questions, and less than six from the first set, then we can consider him/her to come under hyperactive-impulsive subtype.

If the child's score is more than six out of nine for "often" and "very often" from both sets, then we can consider him/her to come under combined subtype.

## Results

Forty-eight schools had students from the first to the sixth grade, who were of 6-12 years of age. The total number of students in the district was 4374 (2063 males and 2311 females).

A total of 386 children showed school failure, learning difficulties, hyperactivity, inattention, and impulsivity in single form or combination. All these children were subjected to the Arabic version of DMS-IV questionnaire for ADHD diagnosis and classification.

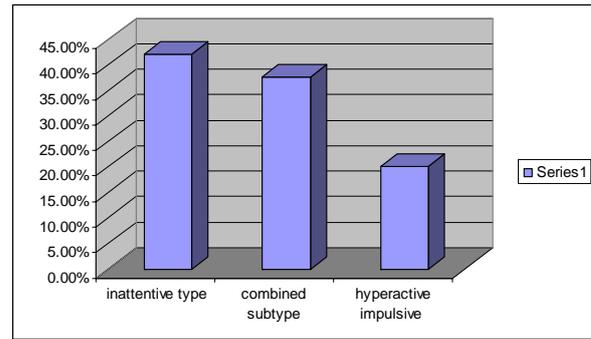
In the secondary screening, a total of 273 children met the criteria for ADHD (6 items out of 9 for each set of criteria) as shown in Figure (1). The total prevalence of this disorder in school children was 6.24% (see Table 1).

As 186 out of the 2063 male children demonstrated ADHD, the prevalence among school boys was 9%. On the other hand, 87 out of the 2311 female children suffered from ADHD, and thus, the prevalence among the school girls was 3.7%. Furthermore, the male to female ratio was 2.4:1.

**Table (1): Total sample distribution and prevalence.**

	<u>Population</u>	<u>ADHD</u>	<u>%</u>
Male	2063	186	9
Female	2311	87	3.7
Total	4374	273	6.24

With regard to the subtypes: Inattentive subtype: 115 (42.1%); combined subtype: 103 (37.7%); hyperactive-impulsive: 55 (20.1%) (As shown in Figure 1).



**Figure (2): Distribution of the subtypes.**

**Table (2): Sex distribution for subtypes, and consanguinity total.**

	Male	%	Female	%	Total	Consanguinity (Total)
Combined	78	75.7%	25	24.3%	103	32%
Inattentive	69	60%	46	40%	115	41.7%
Hyperactive + impulsive	39	70.9%	16	29.1%	55	25.4%
Total	186		87		273	

**Learning difficulties: The prevalence was for: mathematics: 162 (59.3%) and language 145 (53.1%).**

## Discussion

The diagnostic criteria for ADHD are officially set forth in DSM-IV. The child must have six or more of the nine inattention symptoms or six or more of the nine hyperactivity/impulsivity symptoms present "for at least six months to a degree that is maladaptive and inconsistent with developmental level." Some of the symptoms must have been present in the child before the age of 7.

Although clinical evaluation is the golden standard for the diagnosis of ADHD, two-setting screening questionnaires by parent and teacher are useful tools in identifying children who need further investigation and intervention.

Teachers play their most crucial role before any diagnosis is actually made by the family physician, psychiatrist, or pediatrician. According to Weber et al. (1992), children who are suspected of having ADHD are initially identified because of their behavioral and academic performance in the classroom. Studies conducted in schools repeatedly report the same sequence of events for many children referred for suspected ADHD. Teachers become aware of the

students' difficulty in meeting the behavioral, attentional, and academic norms for the class and suggest the possibility of ADHD to parents (Percy, Clopton, & Pope, 1993; Runnheim et al., 1996; Weber, et al., 1992).

Referred students are frequently diagnosed as having ADHD by the physician based on reports from the teachers and parents. Kwasman et al. (1995) reported that 39% of physicians telephoned the schools of children who had been referred for ADHD and 77% attempted to obtain a written report from the school.

In the absence of independently valid tests for ADHD (NIH Consensus Statement, 1998), teacher referrals have become a significant factor in determining whether a child will be diagnosed with the disorder. If a teacher informs parents that the child should be evaluated for ADHD, that teacher is also likely to rate the child high on characteristics associated with the disorder.

The main tool for this study was the teachers questionnaire. We trained ten social workers who are expertise in screening studies. They explained to each teacher the objective of the study but mainly the inclusion criteria which was overemphasized for each teacher.

A small group of children has been evaluated in clinic, I compared both teachers and parents questionnaires and I found that in most of cases the basic criteria for diagnosis was present which means that the questionnaire is actually still a valid tool for screening but some parents are more protective than teachers.

The prevalence of ADHD among all school children in our study was 6.24%. The prevalence among the school boys and girls was 9% and 3.7%, respectively (Table 1), and the male to female ratio was 2.4:1. To our knowledge, no studies have examined the prevalence of ADHD in Jordan, and data from other countries in the Middle East are scarce, apart from the figures reported by Al- Sharabaty et al. (2004) who based on a school-based study carried out in Oman, reported a prevalence of ADHD in school boys and girls as 7.8 and 5.1%, respectively.

In another study carried out in Dammam, Saudi Arabia, the overall prevalence of combined ADHD was 16.4% and the study was conducted among males only. However, these figures were high when compared with those reported worldwide.<sup>8</sup>

In a study using parent's questionnaire to school-children population in Baghdad, 5.9% of the children were found to suffer from ADHD with a male to female ratio of 2.2:1.<sup>1</sup>

In studies in USA (Mayo Clinic 2002), the prevalence of ADHD was 7.5%. Furthermore, according to figures from the Centers for Disease Control and Prevention (CDCP), Vital and Health Statistics publication,<sup>6</sup> approximately 7% of the children aged between 6 and 11 years had AD/HD (with or without a learning disability). Thus, it can be concluded that the prevalence of ADHD in Jordan fits with the recognized international patterns.

Male to female ratio and subtypes; ADHD (Attention Deficit Disorder (ADD) is more frequently diagnosed among boys than girls. Most of the estimates of the male to female ratio range between 3:1 and 4:1 in the clinical populations. However, many community-based

samples have demonstrated a ratio of 2:1. Recognition of ADHD (ADD) has improved over the last decade, and the male to female ratio has been decreasing, and this may be owing to the increased recognition of inattentive ADHD (ADD).

The highest ratio (3.1) was observed in the combined subtype, while the lowest ratio (1.5) was found in the inattentive subtype. Furthermore, the ratio of general prevalence to the prevalence of the combined subtype was observed to be 2.4:1.

Male to female ratio with regard to the subtypes: Inattentive subtype: 115 (42.1%); combined subtype: 103 (37.7%); hyperactive-impulsive: 55 (20.1%) subtypes.

### **Consanguinity**

The overall prevalence of consanguinity was almost 34.8% and was more common in inattentive subtypes than in the other subtypes (see Table 2).

Abdulbari Bener et al. (2006) in a study carried out in Qatar, showed a significant relationship ( $p=0.010$ ) between ADD symptoms and consanguineous parents.

### **Learning Difficulties**

In our study, we included the achievement in mathematics and language, and found that 59.3% of our cases showed difficulty in mathematics and 53.1% had language difficulties (see Table 6). Mayes et al. (2000) suggested that learning and attention problems are on a continuum, and are interrelated and they usually coexist.

### **Conclusion**

In this study, we found that the prevalence of AD/HD in Jordan is similar to that observed worldwide.

Furthermore, we observed that the male to female ratio was still high, in spite of the recent publication reporting that this ratio is decreasing.

In our study, this ratio was high in all the subtypes, and was the most prominent in the inattentive subtype.

Consanguinity was found to be very prominent, particularly in the inattentive subtype, which may be owing to the strong familial and genetic predisposing factors for the disorder but since consanguinity rate is actually high in Jordan more studies are needed to evaluate this relation. Furthermore, learning difficulties were found to be strongly associated with AD/HD.

### Recommendations

This study has clearly shown a high prevalence of AD/HD among the school children in Jordan, and hence, it is important to increase public awareness about this disorder as well as educate parents and teachers by using parents' and teachers' guides for ADHD in the Arabic language.

However, more studies on this disorder including parents' questionnaire teacher questionnaire as well as clinical and psychological evaluation to children with this disorder are recommended.

### Acknowledgment

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### References

1. Abdul Kareem Salman AlObaidi, and Numan S. Ali. Attention deficit/hyperactivity disorder among schoolchildren in Baghdad. *Journal of the Canadian Academy of Child and Adolescent Psychiatry* 2009; 18 (1): 4-5.
2. Abdulbari Bener, Razna Al Qahtani, Ibrahim Abdelaal. The prevalence of ADHD among primary school children in an Arabian society. *Journal of Attention Disorders* 2006; 10 (1): 77-82.

3. Al-Sharbati M. et al. ADHD in Omani schoolgirls. *Journal of the American Academy of Child and Adolescent Psychiatry* 2004.
4. American Academy of Pediatrics. Clinical practice guidelines: Diagnosis and evaluation of the child with attention- deficit/ hyperactivity disorder. *Pediatrics* 2000; 105: 1158-1170.
5. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders: DSM IV (4<sup>th</sup> ed., text, and revision), Washington, D.C.: American Psychiatric Association 2000.
6. Barkley RA. Attention Deficit Hyperactivity Disorders: A Handbook for Diagnosis and Treatment. New York: Guilford Press 1998.
7. Faraone SV, Biederman J, Mick E. The age-dependent decline of attention-deficit hyperactivity disorder: A meta-analysis of follow-up studies. *Psychology and Medicine* 2006; 36: 159-165.
8. Jamal HA, Attia ZT, Amr AS, Hassan B. Attention deficit hyperactivity disorder (ADHD): Is it a health problem among male primary school children. *Bahrain Medical Bulletin* 2008; 30 (2).
9. Kessler RC, Adler L, Barkley R et al.: The prevalence and correlates of adult ADHD in the United States: Results from the National Comorbidity Survey Replication. *American Journal of Psychiatry* 2006; 163: 7.
10. Kwasman A, Tinsley BJ, Lepper HS. Pediatricians' knowledge and attitudes concerning diagnosis and treatment of attention deficit and hyperactivity disorder. *Archives of Pediatric Adolescent Medicine* 1995; 149: 1211-1216.
11. Mayo Clinic. Utilization and costs of medical care for children and adolescents with and without attention-deficit/hyperactivity disorder. *Journal of the American Medical Association* 2001; 285(1): 60-66.
12. Mayo Clinic. How common is attention-deficit/hyperactivity disorder? *Archives of Pediatrics and Adolescent Medicine* 2002; 156 (3): 209-221.
13. Percy MT, Clopton JR, Pope AW. Influences on teacher referral of children to mental health services: Gender, severity, and internalizing versus externalizing problems. *Journal of Emotional and Behavioral Disorders* 1993; 1: 165-169.
14. Runnheim VA, Frankenberger W, Hazelkorn M. Medicating students with emotional and behavioral disorders and ADHD. *Behavioral Disorders* 1996; 21: 306-314.
15. Weber KS, Frankenberger W, Heilman K. The effects of Ritalin on the academic achievement of children diagnosed with Attention-Deficit Hyperactivity Disorder. *Developmental Disabilities Bulletin* 1992; 20: 49-68.

## انتشار تناذر فرط الحركة وتشتت الانتباه والاندفاعية لدى أطفال المدارس في لواء القصر الأردن

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### الملخص

اهداف الدراسة: هو تحديد انتشار هذه المتلازمة وانواعها الفرعية، تأثيرها على التعليم وبعض علاقاتها الأخرى.

تصميم الدراسة: دراسة مسحية على طلاب المدارس.

جمهور الدراسة: جميع اطفال المدارس بين عمر (6-12) سنة ذكور واثاث في لواء القصر جنوب الاردن.

الطريقة: كانت طريقة الاختيار هي كل طفل لديه فرط حركة، اندفاعية، تشتت انتباه، صعوبات تعليمية، فشل دراسي، على هؤلاء طبقت

النسخة العربية من الطبعة الرابعة للدليل التشخيصي والاحصائي لجمعية اطباء النفسية الأمريكية.

النتائج: ما مجموعه 4374 طالباً اجري عليهم المسح، 273 حالة تبين انها تعاني من هذا التناذر اي بمعدل انتشار %6.24 النسبة كانت

%9 عند الذكور و %3.7 عند الاثاث بحيث كانت نسبة الذكور الى الاثاث 1-2.4، الصعوبات التعليمية كانت بنسبة %59.3

للرياضيات و %53.1 للغة العربية، اما نسبة القراءة من الدرجة الاولى فكانت %34.8.

الاستنتاج: ان نسبة هذا التناذر في الاردن تقارب نسبة انتشاره في البلدان الاخرى، نسبة الذكور الى الاثاث مرتفعة في جميع الانواع الفرعية

بالاضافة الى ان ارتباط الصعوبات التعليمية بهذا التناذر كان عاليا.

الكلمات الدالة: تناذر فرط الحركة، تشتت الانتباه والاندفاعية، انتشار، الأردن.