

# Symptom Prevalence of ADHD and ODD in a Pediatric Population in Argentina

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**Objective:** To assess the prevalence of DSM III-R symptoms of attention deficit hyperactivity disorder (ADHD) and oppositional defiant disorder (ODD) in an outpatient pediatric population; to compare oppositional behavior and grade retention rates; and to establish local means and standard deviations (*SD*) for the ADHD rating scale. **Method:** 300 children (149m, 151f; 6 to 12 yrs) were evaluated for ADHD and ODD symptoms with the DuPaul and an author-designed rating scale, respectively. Scores 1.5 *SD* above the mean were considered positive for each disorder. **Results:** A total of 27 subjects (13m, 14f), 9%, had positive scores consistent with ADHD. These children had an oppositional behavior rate of 33.3% and a grade retention rate of 30.7%. Those who did not have positive scores for ADHD had a rate of 5.5% and 7.3%, respectively. The mean scores for the boys on the ADHD rating scale was 17.1 (*SD* = 8.6); the girls had a mean of 14.7 (*SD* = 7.3). **Conclusion:** The prevalence rates in our study are similar to those found in other countries (*J. of Att. Dis.* 2007; Vol 11(3) 363-367)

**Keywords:** prevalence; ADHD; ODD; grade repetition

## Introduction

Attention deficit hyperactivity disorder (ADHD) is a biologically-based disorder characterized by inattention, hyperactivity, and impulsivity (DSM-IV; Castellanos, et al., 2002; Castellanos & Tannock, 2002; Faraone, 1998; Seidman, 2004). It is often comorbid with other disorders such as oppositional defiant disorder (ODD), antisocial behavior, depression and anxiety disorders, and is one of the most common psychiatric disorders among children (Biederman et al., 1996; Breton et al., 1999; Costello et al., 1996; Cuffe, Moore, & McKeown, 2005; Faraone, Sergeant, Gillberg, & Biederman, 2003; Jensen et al., 2001).

Epidemiological studies conducted in various countries have revealed prevalence rates ranging from 4% to 12% in the general population of children between the ages of 6 and 12 (10.3% when using DSM III-R diagnostic criteria),

with a higher frequency among boys than girls (Brown et al., 2001).

Children afflicted by this disorder typically display school performance that is worse than would be expected for their intellectual development. Thirty-five percent of them are grade repeaters, and they usually have difficulties following rules and responding to limits. Children with ADHD tend to have more disciplinary problems and experience more peer rejection particularly when associated with oppositional and conduct disorders (Bagwel, Molina, Pelham, & Hoza, 2001; Barkley, 1998; Edwards, Barkley, Laneri, Fletcher, & Metiva, 2001).

ODD is the most common comorbid condition associated with ADHD both in the outpatient clinical setting and in the general population (August, Realmuto, Joyce,

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& Hektner, 1999; Biederman et al., 1996; Jensen et al., 2001; Rohde et al., 1999; Wilens et al., 2002). When treating ADHD, the clinician must keep in mind that the presence of ODD typically worsens the symptoms of ADHD, potentially contributing to further academic difficulties, conduct problems, and peer rejection (Barkley, 1998; Goldman, Genel, Bexman, & Slanetz, 1998).

Although the epidemiology of ADHD has been studied extensively in various countries, this line of investigation has received relatively little attention in Argentina. This is due, in part, to the great influence psychoanalytic theory continues to have on child mental health professionals and pediatricians. Behavioral problems are often attributed to deep emotional conflicts motivated by parent-child interactions. Moreover, pediatricians and child neurologists generally disregard the diagnosis if hyperactive behavior is not manifested at the clinic. Children who present typical ADHD symptoms are often referred to mental health services by their school, where a majority are misdiagnosed, thus not receiving appropriate treatment. In a previous study the author established that 31% of school-age children admitted to a child mental health service fulfilled the DSM III-R criteria for ADHD. The male to female ratio in this sample was 5:1, 30% of these children also met criteria for ODD, and 33% had repeated a grade (Michanie, Marquez, & Estevez, 1993). This is consistent with the notion of cross-cultural similarities in the prevalence of psychiatric symptoms, so long as the same diagnostic criteria are used.

The aim of this study is to obtain information about the prevalence of ADHD symptoms and associated problems in a nonreferred sample of school-age children (6 to 12 years old). This pediatric population was chosen for the study because, according to studies done in other countries, the prevalence rates of ADHD found in this population are similar to those in the general population (Brown et al., 2001).

## Methods

### Patient Population

The sample consisted entirely of children from Buenos Aires, Argentina's capital city, which has a population of 3,000,000 inhabitants. In Buenos Aires, 98.3% of children ages 6 to 12 attend school.

The participants were recruited from the consecutive consultations of several outpatient pediatric clinics at three private hospitals in Buenos Aires during a period of 2 months. We assume that the socioeconomic status of our

sample population was between middle- and lower-middle-class brackets, because this is the population covered by the health insurance of these hospitals. The majority of the middle-class population in Buenos Aires is of European descent, mostly Spanish and Italian.

The sample consisted of 300 school age children: 149 boys and 151 girls. The age range was 6 to 12 years (mean = 8.6 years and  $SD = 2.0$ ). Children who were not accompanied by their parents were excluded.

### Rating Instruments Used

The DuPaul Scale was used in the evaluation of ADHD symptoms. It measures all 14 items of the DSM III-R diagnosis according to various frequency points: 0 = *Not at all*, 1 = *Just a little*, 2 = *Pretty much*, 3 = *Very much*. The range of scores is from 0 to 42, and it takes about 5 minutes to complete. The DuPaul scale (for DSM III-R ADHD) was validated, and normative data was obtained in 1990 in a population of 765 children, ages 6 to 12, in Massachusetts (Barkley, 1990).

For the evaluation of ODD symptoms, the authors developed a questionnaire using the nine items of DSM III-R for this disorder with the same format as the scale for ADHD. The range of possible scores is 0 to 27, and the necessary time for completion is about 3 minutes. A separate question about grade retention was added. For both questionnaires, scores 1.5  $SD$  above the mean suggest a high probability of the presence of ADHD or ODD.

These scales were chosen because they are frequently used in the diagnosis of ADHD, are easy to use, and allow for measurement of the cardinal symptoms of both disorders. To make meaningful comparisons with similar studies conducted in other parts of the world we used DSM III-R diagnostic criteria (Brown et al., 2001).

### Study Design

All questionnaires were completed by parents in the waiting areas of the clinics. The information obtained was entered into a database. The means and standard deviations of the data were calculated separately for boys and girls.

We considered 1.5  $SD$  above the mean a positive score for each disorder for each sex. Because we used a statistical method to determine the pathological scores, and to ensure that these scores were reliable in detecting the presence of ADHD, we compared them to the mean scores obtained with the DuPaul scale in an outpatient psychiatric population of 30 boys and 30 girls, ages 6 to 12, with an established diagnosis of ADHD.

The mean scores for the ADHD scale from the comparison group of 60 subjects, with a well established

diagnosis, were identical for the girls and even lower for the boys' subgroup, when compared to those of our study group using the mean plus 1.5 *SD* as our criteria for making a positive case of ADHD.

We assessed the occurrence of ODD symptoms in the positive ADHD and negative ADHD groups. We also measured grade retention rates (GRR) among boys and girls with and without positive scores for ADHD.

## Results

The mean scores for the sample of boys on the ADHD rating scale was 17.1 with a *SD* of 8.6. The girls in the sample had a mean of 14.7 with a *SD* of 7.3. Cutoff scores for a positive score for ADHD were 30.1 for boys and 25.7 for girls.

The mean score for boys on the ODD rating scale was 8.9 with a *SD* of 5.3. The girls had a mean of 7.9 with a *SD* of 4.7. The resultant cutoff scores were 16.8 and 14.9, respectively.

Using these cutoff scores, 27 children out of a total of 300 had positive scores on the ADHD scale. This represents 9.0% (CI 95% = 6.0%–12.8%) of the total sample; whereas for the ODD scale, 24 children had positive scores, which represents 8.0% (CI 95% = 5.1%–11.6%). No gender differences were found among the positive scores for either disorder.

Positive scores for the ODD scale were found in 5.5% (CI 95% = 3.1%–8.9%) of the non-ADHD group, as compared to 33.3% (CI 95% = 16.5%–53.9%) in the positive-ADHD group ( $p < 0.05$ ).

Out of 151 girls, only 2 (1.3%) had to repeat school grades. Among the 149 boys, 14 (9.4%) were repeaters.

The GRR was 7.3% (CI 95% = 5.4%–11%) in the non-ADHD group and 30.7% (CI 95% = 14.5%–49.7%) for the positive-ADHD group ( $p < 0.05$ ).

## Discussion and Conclusions

Our findings for ADHD are similar to prevalence rates found among the pediatric population in studies performed in the United States utilizing similar rating instruments (Brown et al., 2001). Our findings are also similar to prevalence rates for ADHD found among the general population in other countries (Bird et al., 1988; Costello et al., 1988, 1996; Faraone et al., 2003; Newcorn et al., 1994; Pelham, Gnagy, Greenslade, & Milich, 1992; Szatmari, Offord, & Boyle, 1989).

Our cutoffs are also validated by the much higher rate of oppositional behavior and grade retention found in the

statistically selected positive-ADHD group when compared to the non-ADHD group.

It is interesting to note that if we had used a cutoff for ADHD based on the DuPaul norms for the Massachusetts population, we would have identified the same number of males and females as positive. This is attributable to the Massachusetts norms having a cutoff for boys and for girls of 30.5 and 24.1 respectively (Barkley, 1990), which would have been almost identical to ours (30.1 and 25.7).

In our study we found no gender difference for ADHD. This contradicts the gender difference of 3 boys to 1 girl found in many studies in various countries; however, it is similar to the findings in a prevalence study of ADHD in Brazilian adolescents using DSM-IV criteria (Rohde et al., 1999).

The high incidence of comorbidity that we found between ADHD and ODD has been well established in studies conducted both in the general population and patients consulting child and adolescent psychiatric clinics (August, Realmuto, Joyce, & Hektner, 1999; Biederman, Newcorn, & Sprich, 1991; Bird et al., 1988; Costello et al., 1996; Michanie et al., 1993; Pelham et al., 1992; Szatmari et al., 1989; Wilens et al., 2002). There were no significant gender differences in comorbidity with ODD in our sample, which is similar to the findings of an Australian twin study on a large, nonreferred population using parent-completed rating scales based on the DSM-IV ADHD criteria (Levy, Hay, Bennett, & McStephen, 2005).

The high rate of school grade repetition (30.7%) in our study for boys with ADHD is also similar to those found in national and international studies (Bird et al., 1988; Michanie et al., 1993; Szatmari et al., 1989; Weiss, Hechtman, Milroy, & Perlman, 1985).

It is worth noting that children scoring positive for ADHD do not necessarily suffer from the disorder but present some significant symptoms of the condition. Therefore, a positive score in the DuPaul scale is only suggestive of the presence of the disorder, which can only be ascertained by performing a complete psychiatric evaluation.

Our study was based solely on parent rating scales, consequently, we do not know if these symptoms were also manifested at school. In clinically-referred children, a clinical diagnosis of DSM III-R ADHD based on parent reports is likely to be corroborated by teacher reports (Biederman, Faraone, Milberger, & Doyle, 1993). Although our sample is not based on a clinical population, children considered positive for ADHD also had a high percentage of oppositional behavior and school retention grades, which is common in children with this disorder.

We believe that the findings of this study are also applicable to ADHD as defined by DSM-IV criteria, because the DSM-IV ADHD criteria have been shown to identify at least 95% of cases diagnosed using the DSM III-R (Biederman et al., 1997; Wolraich, Hannah, Pinnock, Baumgaertal, & Brown, 1996).

This study suggests that the utilization of the same diagnostic instruments in different cultures elicits comparable results. We believe there is a need for further epidemiological studies of ADHD to have a better understanding of its prevalence and manifestations in different countries, enabling early detection through greater awareness of its presence. This will no doubt result in more effective diagnosis and treatment, hopefully better preventing its deleterious effects on children.

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