

An Assessment of Comorbidity and Social Demographics in a Primarily African-American and Hispanic Population of Boys with ADHD Treated in Psychiatric/Non-Psychiatric and Public/Private Clinics in Miami, Florida

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Abstract

Objective: To determine whether social disadvantage and comorbidity in boys with attention-deficit/hyperactivity disorder (ADHD) differ among psychiatric versus non-psychiatric and public versus private clinics.

Methods: This cross-sectional study included boys 6-12 years of age, clinically diagnosed, and pharmacologically treated for ADHD at 1 of 5 clinics in Miami, Florida. The child's caregiver completed a demographics form, the Child Behavior Checklist, and the Child Symptom Inventory.

Results: The study included 174 boys (28% African-American and 64% Hispanic). The sample included 42% psychiatric practices and 73% public clinics. Compared to the non-psychiatric sample, children in the psychiatric samples presented more often with ADHD hyperactive-impulsive subtype and combined subtype. Children in the psychiatric clinics had the most severe forms of ADHD and the most comorbid diagnoses, particularly behavioral, mood, and anxiety disorders. Compared to the private clinics, children in the public psychiatric clinic presented more markers of socioeconomic disadvantage. Public clinics also had more severe ADHD, social phobia, aggressive behavior, and externalizing behaviors than private clinics.

Conclusions: Comorbidity and severity of ADHD in children treated in primary care clinics were lower than, but clinically comparable to, that found in psychiatric clinics. Socioeconomic disadvantages are present in children treated in public clinics.

Keywords: ADHD; Stimulants; Comorbidity; Hispanic; African-American

Introduction

Attention-deficit/hyperactivity disorder (ADHD) has a worldwide incidence rate of 5.3% [1] with significant variability depending on geographic location. The variability is believed to be primarily due to differences in methodological characteristics of studies. The U.S. National Health Interview Survey of 2012 reported that more than 5 million children aged 3-17 had ADHD with an incidence of 10% that has steadily increased over the years [2]. Both Hispanic and African-American children are less likely to have ADHD (6% and 9% respectively) compared to white children (12%). Children in single-mother families are more likely to have ADHD compared to children in two-parent families (12% versus 8%) [2]. A review by Miller et al. [3] found that African-American children have higher ADHD behavior ratings, while puzzlingly at the same time the reported incidence of ADHD is lower for African-American children, with African-American youth being diagnosed only about two-thirds as often as white children. Decreased access to and utilization of psychiatric services by the African-American community can potentially explain this pattern. Hispanic and African-American parents have a unique cultural perspective on illness and interventions,

and they do not identify ADHD in their children as often as Caucasians do. They also have a higher threshold for seeking healthcare services. African-American and Hispanic children are also more likely to be diagnosed as having a learning disorder, rather than ADHD [4]. In addition, after being diagnosed, African-American and Hispanic patients are less likely to receive ADHD medication compared with Caucasians [5-12]. Such treatment trends are unwarranted given the fact that effective response to stimulant treatment has been seen in Hispanic and African-American patient populations with ADHD [5,13,14]. Inadequate treatment of African-American and Hispanic patients may be caused by caregiver attitudes, socioeconomic status, or insurance issues [6,12,15-18].

Several studies have documented that ADHD is a condition commonly associated with comorbid psychiatric diagnoses [19-21]. Comorbidities are also reported in minority patients with the disorder [22]. The failure to appropriately diagnose and treat the comorbid conditions that commonly accompany ADHD can have a negative effect on the long-term prognosis of these children and could lead to the development of other psychosocial complications, such as mood disorders, substance abuse disorders, and criminality [23,24]. In the United States, two-thirds of the children diagnosed with ADHD are treated in the primary care setting by primary care physicians and pediatricians [25-27]. Some studies have suggested that children with ADHD managed in primary care settings have fewer comorbidities

and impairments than those seen in psychiatric clinics [26-28], but other studies have reported no differences. For example, both pediatric and psychiatric samples have similarly high levels of comorbidities, disruptive behaviors, mood and anxiety disturbances, and cognitive, interpersonal, and academic impairments [29].

A longitudinal cohort study compared ADHD severity, care, and outcomes in primary care and specialty mental health clinics in a sample comprised predominantly of minority backgrounds [30]. Demographic characteristics were similar in both settings, except that children living with a non-biologic or foster parents were more likely to receive care in a specialty mental health clinic, rather than primary care. Clinical severity and academic variables did not differ significantly between children who received ADHD care either in primary care or in specialty mental health care at study entry. Those who had sought care in both settings had higher functional impairment. No differences were found in the presence of comorbidity of oppositional defiant disorder, conduct disorder, depression, or anxiety between the two settings. Interestingly, more children in the primary care setting were prescribed stimulants compared to specialty mental health, while children in specialty mental health were more likely to receive psychosocial support and psychotherapy. In general, clinical outcomes did not vary between primary care and specialty mental health settings [30]. In contrast, an earlier study did not find any significant differences in the prescription of stimulants between psychiatrists and primary care physicians [31]. Differences in insurance type are also seen, with most patients diagnosed with ADHD having Medicaid or other public insurance (11%) compared with private insurance (6%) [16]. These findings have important public health implications, as they question whether pediatric and psychiatric samples of children with ADHD will face a different or an equally high risk of potentially negative long-term outcomes based on their treatment patterns and insurance type.

The objectives of this study were to compare: (1) demographic differences and social disadvantage in children being treated for ADHD in psychiatric versus non-psychiatric settings and public versus private settings; (2) the severity of ADHD symptoms in children being treated for ADHD in psychiatric versus non-psychiatric settings and public versus private settings; (3) the severity of co-morbid symptoms in children being treated for ADHD in psychiatric versus non-psychiatric settings and public versus private settings; and (4) the severity of maladaptive behavioral and emotional problems in children being treated for ADHD in psychiatric versus non-psychiatric settings and public versus private settings.

Methods

Subjects

The sample included boys 6-12 years of age who had been clinically diagnosed and were being treated pharmacologically for ADHD at five clinics in Miami, Florida, from June 2004 to June 2005. Children were excluded if they had previously diagnosed major sensorimotor handicaps, intellectual disability, autism, or psychosis. Subjects were selected by convenience sampling of consecutive admissions to the clinics. Written informed consent was obtained from each parent and an assent form was obtained from each child prior to participation in the study. The study was approved by the Institutional Review Board of the University of Miami/Jackson Memorial Hospital and the Miami Children's Hospital.

Clinics

Subjects were sampled from consecutive established patients presenting for visits to 3 clinics in a public hospital and 2 clinics in a private hospital in Miami, Florida. Public hospital clinics included a child psychiatry clinic (Pub-Psych), a general pediatrics clinic (Pub-Peds), and a specialized ADHD clinic in the department of pediatrics at the public hospital (Spc-ADHD-Peds). Private hospital clinics included a child psychiatry clinic (Pvt-Psych) and a pediatric neurology clinic (Pvt-Peds-Neuro).

Measures

Parents completed a sociodemographics questionnaire and two standardized measures: the Achenbach's Child Behavior Checklist (CBCL) and the Child Symptom Inventory (CSI) [32,33]. The CBCL computes scores for profiles of behavioral problems (i.e., withdrawn, somatic complaints, anxious/depressed, social problems, thought problems, attention problems, delinquent behavior, aggressive behavior, internalizing, externalizing, and a total score). A raw T score is calculated for each subscale. T scores more than 60 are indicative of dysfunctional behavior (c.f., <http://www.aseba.org/>) [34]. The CBCL has been shown to have long-term stability in subjects with ADHD [35]. The CSI assesses the subject for ADHD and other emotional and behavioral disorders, including oppositional defiant disorder, conduct disorder, anxiety disorders, major depressive disorder, autistic disorder, Asperger's syndrome, social phobia, and separation anxiety disorder. The parent checklist contains 97 items covering 17 disorders, rating each item on a 4-point scale that indicates how often the symptom is observed in the child. Responses are scored for symptom count and symptom severity. The CSI has been shown to have adequate reliability and validity in previous studies [32,34]. Two child and adolescent psychiatry fellows conducted the assessments and were appropriately trained in the use of the instruments.

Statistical analysis

Data were analyzed using SPSS 21 for Windows. Frequency and descriptive statistics were calculated to describe all relevant characteristics of the data. For sociodemographic and categorical variables, Pearson's χ^2 was used to determine any significant differences in proportions between clinics. Analysis of variance (ANOVA) was applied for continuous variables. Pairwise comparisons were calculated with Least Significant Difference tests. Specifically, the primary independent variable, clinic setting, was tested within the ANOVA framework to detect differences between the scales on the CBCL and CSI (the dependent variables). ANOVA analysis revealed a significant difference among the clinics for age and duration of ADHD. Therefore, analysis of covariance was applied, with age and duration of ADHD used as covariates in subsequent ANOVAs. To reduce the risk of a Type I error and more accurately interpret the results, p values were adjusted with a Bonferroni correction for each block of analyses (block refers to the individual CBCL and CSI scales) to account for multiple comparisons. For the CBCL, the null p value for significance was $0.05/10=0.005$ (the denominator is 10 because the CBCL has 8 scales plus internalizing and externalizing scales). For the CSI, the null p value for significance was $0.05/11=0.005$ (the denominator represents the 11 CSI scales).

Results

Subjects

Of the original sample (n=174), 4 patients were excluded due to incomplete data. Subjects in the final sample (n=170) included 50 from the Pub-Psych, 49 from the Pub-Peds, 25 from the Spc-ADHD-Peds, 21 from the Pvt-Psych, and 25 from the Pvt-Peds-Neuro groups. The public clinics (Pub-Psych, Pub-Peds, and Spc-ADHD-Peds) accounted for 73% (124/170) of the total sample, and the psychiatric practices (Pub-Psych and Pvt-Psych) accounted for 42% (71/170) of the total sample. Table 1 summarizes the clinical and sociodemographic characteristics. The average age of the sample was 9.1 years (SD=1.9), 28% were African-American (n=48), 64% were Hispanic (n=108), and

8% were of other ethnicity (n=14). The other ethnicity were 8 American Indian, 4 Haitian, and 2 other/mixed. More African-American (44%) and Hispanic (26%) patients were treated in the Pub-Psych setting, followed by the Spc-ADHD-Peds setting (38% and 25%, respectively). The socioeconomic status of the children from Pub-Psych and Spc-ADHD-Peds was lower than the status of those from the other 3 clinics ($\chi^2=100.8$ [4], $p<0.001$). In terms of family structure, children from the Pub-Psych group had less intact families (69% “other”), which included more foster care, compared with children from the other 4 clinics. The majority of children from single parent homes were from the Spc-ADHD-Peds (47%) clinic and the Pub-Psych (26%) clinics. The majority of children requiring special education placement were from the Pub-Psych clinic (52%) followed by the Spc-ADHD-Peds clinic (28%).

Variable	Category	Pub-Psych (n=50)	Pub-Peds (n=49)	Spc-ADHD-Peds (n=25)	Pvt-Psych (n=21)	Pvt-Peds-Neuro (n=25)	Stat (df), p-Value
Age	Years, mean (SD)	9.5 (1.8)	8.9 (1.9)	8.5 (1.8)	10.3 (2.0)	8.9 (1.8)	F=4.9 (4,169), 0.01
ADHD Diagnosis	Years, mean (SD)	3.2 (1.6)	3.6 (1.6)	2.7 (1.2)	4.1 (1.8)	2.1 (1.2)	F=7.1 (4,169), 0.01
Ethnicity	African- American, n (%)	21 (44)	7 (15)	18 (38)	2 (4)	0	$\chi^2=26.6$ (8), 0.01
	Hispanic, n (%)	28 (26)	13 (12)	27 (25)	17 (16)	23 (21)	
	Other, n (%)	1 (7)	5 (36)	4 (29)	2 (14)	2 (14)	
Guardian	Mother*, n (%)	38 (26)	21 (14)	42 (29)	21 (14)	25 (17)	$\chi^2=19.4$ (12), 0.08
	Father*, n (%)	4 (36)	3 (27)	4 (36)	0	0	
	Relative, n (%)	4 (50)	1 (13)	3 (37)	0	0	
	Other, n (%)	4 (100)	0	0	0	0	
Family Income	<\$20,000, n (%)	43 (48)	3 (3)	41 (46)	1 (1)	1 (1)	$\chi^2=100.8$ (4), 0.01
	>\$20,001, n (%)	7 (9)	22 (27)	8 (10)	20 (25)	24 (30)	
Family Structure	Two parents, n (%)	14 (17)	15 (18)	22 (27)	11 (13)	20 (24)	$\chi^2=47.7$ (12), 0.01
	One parent with step, n (%)	14 (58)	1 (4)	1 (4)	5 (21)	3 (13)	
	One parent, n (%)	13 (26)	7 (14)	24 (47)	5 (10)	2 (4)	
	Other, n (%)	9 (69)	2 (15)	2 (15)	0	0	
School	Regular, n (%)	26 (24)	16 (15)	34 (31)	15 (14)	18 (16)	$\chi^2=32.0$ (8), 0.01
	Regular with special education, n (%)	24 (52)	6 (13)	13 (28)	1 (2)	2 (4)	
	Other, n (%)	0	3 (20)	2 (13)	5 (33)	5 (33)	

Pub-Psych=child psychiatry clinic at the public hospital; Pub-Peds=general pediatrics clinic at a public hospital; Spc-ADHD-Peds=specialized attention-deficit/hyperactivity (ADHD) clinic in the department of pediatrics at the public hospital; Pvt-Psych=child psychiatry clinic at a private pediatric hospital; Pvt-Peds-Neuro=pediatric neurology clinic at a private pediatric hospital.

*Mother and father designations include biological, adoptive, or step parents.

Table 1: Subject sociodemographics by clinic.

Psychiatric versus non-psychiatric clinics

The psychiatric clinics included Pub-Psych and Pvt-Psych. The children in the psychiatric clinics were significantly older ($t=3.7$ (168);

$p<0.001$) and had been in treatment more years ($t=2.9$ (168); $p<0.01$) compared with those in the non-psychiatric clinics (Table 2). The children in the psychiatric group had significantly greater severity of symptoms of conduct disorder ($t=3.3$ (168); $p<0.001$), generalized

anxiety ($t=4.8$ (168); $p<0.001$), and major depression ($t=4.6$ (168); $p<0.001$) compared with the non-psychiatric group. Although not statistically significant, trends were noted for higher severity of hyperactive-impulsive ADHD, combined types of ADHD, oppositional defiant disorder, autistic disorder, and Asperger's disorder on the CSI in the psychiatric sample. No statistically significant difference was

found in the severity of ADHD symptoms in the psychiatric versus non-psychiatric group. On the CBCL, although not statistically significant, trends were noted for children in the psychiatric group having more social problems, aggressive behavior, and externalizing problems than those in the non-psychiatric groups.

Variable	Psychiatric Clinics	Non-psychiatric Clinics	Stat (df, p-value)
Age, y (mean [SD])	9.73 (1.88)	8.67 (1.82)	$t=3.7$ (168), <0.001
Years of treatment (mean [SD])	3.46 (1.66)	2.77 (1.41)	$t=2.9$ (168), <0.01
CSI (mean [SD])			
Inattentive ADHD	65.97 (11.78)	63.08 (10.80)	$t=1.7$ (168), <0.10
Hyperactive-Impulsive ADHD	65.85 (12.95)	61.82 (12.84)	$t=2.0$ (168), 0.046
Combined ADHD	66.94 (12.17)	63.23 (11.05)	$t=2.1$ (168), 0.040
Oppositional defiant disorder	60.89 (13.19)	55.53 (12.39)	$t=2.7$ (168), <0.01
Conduct disorder	61.04 (18.48)	53.55 (10.81)	$t=3.3$ (168), <0.001
Generalized anxiety	63.00 (13.37)	54.59 (9.36)	$t=4.8$ (168), <0.001
Major depression	62.90 (15.96)	53.73 (10.28)	$t=4.6$ (168), <0.001
Autistic disorder	54.10 (9.61)	51.10 (9.41)	$t=2.0$ (168), 0.044
Asperger's disorder	55.15 (11.55)	51.43 (10.90)	$t=2.1$ (168), 0.034
Social phobia	59.14 (12.03)	61.67 (11.40)	$t=1.4$ (168), 0.17
Separation anxiety	52.93 (10.29)	52.01 (11.70)	$t=0.5$ (168), 0.60
CBCL (mean [SD])			
Withdrawn problems	57.14 (6.95)	57.21 (7.08)	$t=0.1$ (168), 0.95
Somatic complaints	56.86 (7.77)	55.34 (7.11)	$t=1.3$ (168), 0.19
Anxious/depressed	58.24 (9.01)	56.37 (8.23)	$t=1.4$ (168), 0.16
Social problems	61.10 (8.90)	58.01 (7.88)	$t=2.4$ (168), 0.02
Thought problems	58.32 (8.74)	56.36 (7.58)	$t=1.6$ (168), 0.12
Attention problems	64.07 (9.26)	63.55 (8.70)	$t=0.4$ (168), 0.71
Delinquent behavior	60.32 (8.92)	58.22 (9.84)	$t=1.4$ (168), 0.16
Aggressive behavior	61.65 (11.12)	58.35 (8.67)	$t=2.2$ (168), 0.03
Total score	61.85 (9.70)	59.29 (8.84)	$t=1.8$ (168), 0.08
Internalizing problems	56.85 (10.69)	54.64 (10.50)	$t=1.3$ (168), 0.18
Externalizing problems	60.20 (11.03)	56.80 (10.27)	$t=2.1$ (168), 0.04
ADHD=attention-deficit/hyperactivity disorder; CSI=Child Symptom Inventory. The psychiatric clinics included Pub-Psych and Pvt-Psych. The non-psychiatric clinics included Pub-Peds, Spc-ADHD-Peds, and Pvt-Peds-Neuro.			

Table 2: Sociodemographic variables and results of CSI and CBCL scales for psychiatric versus non-psychiatric clinics.

Public versus private clinics

The public clinics included Pub-Psych, Pub-Peds, and Spc-ADHD-Peds. Before analyzing potential differences between public and private clinics, it was taken into account that the families in the Pvt-Psych,

Pvt-Peds-Neuro, and Pub-Peds groups had a higher socioeconomic status than those in the Spc-ADHD-Peds and Pub-Psych groups (Table 1). In the initial analysis, Spc-ADHD-Peds was included among the public clinics, but subsequently Spc-ADHD-Peds was excluded from the analysis. Both times, virtually identical results were obtained. On

the CSI, subjects in the public groups had greater severity of hyperactive ($t=3.8$ (168); $p<0.001$) and combined ($t=3.7$ (168); $p<0.001$) subtypes of ADHD and more severe symptoms of social phobia ($t=3.0$ (168); $p=0.003$). A non-significant trend was noted for greater severity of the inattentive subtype of ADHD (Table 3). On the

CBCL, trends were noted for the public hospital sample having more aggressive behavior ($t=3.0$ (168); $p<0.01$), more externalizing problems ($t=2.9$ (168); $p<0.01$), and more attention problems ($t=2.9$ (168); $p<0.01$) than the children in the private clinics (Table 3).

Variable	Public Clinics	Private Clinics	Stat (df), p-Value
CSI (mean [SD])			
Inattentive ADHD	65.65 (11.08)	60.61 (11.10)	$t=2.6$ (168), <0.01
Hyperactive-Impulsive ADHD	65.72 (12.61)	57.52 (12.26)	$t=3.8$ (168), <0.001
Combined ADHD	66.73 (11.20)	59.54 (11.27)	$t=3.7$ (168), <0.001
Oppositional defiant disorder	57.97 (12.75)	57.22 (13.67)	$t=0.3$ (168), 0.74
Conduct disorder	56.89 (13.70)	56.11 (18.00)	$t=0.3$ (168), 0.76
Generalized anxiety	58.27 (11.12)	57.65 (14.00)	$t=0.3$ (168), 0.77
Major depression	57.38 (13.04)	58.04 (15.45)	$t=0.3$ (168), 0.78
Autistic disorder	52.82 (9.28)	51.09 (10.35)	$t=1.1$ (168), 0.30
Asperger's disorder	53.31 (10.92)	52.11 (12.32)	$t=0.6$ (168), 0.54
Social phobia	62.21 (10.77)	56.30 (13.08)	$t=3.0$ (168), 0.003
Separation anxiety	52.77 (10.52)	51.37 (12.64)	$t=0.7$ (168), 0.47
CBCL (mean [SD])			
Withdrawn problems	57.62 (7.14)	56.00 (6.54)	$t=1.3$ (168), 0.18
Somatic complaints	55.82 (7.22)	56.39 (7.96)	$t=0.4$ (168), 0.66
Anxious/depressed	57.07 (8.76)	57.37 (8.20)	$t=0.2$ (168), 0.84
Social problems	59.40 (8.66)	59.02 (7.86)	$t=0.3$ (168), 0.79
Thought problems	56.57 (7.92)	58.83 (8.49)	$t=1.6$ (168), 0.11
Attention problems	64.75 (8.97)	61.11 (8.30)	$t=2.9$ (168), <0.01
Delinquent behavior	59.56 (10.16)	57.85 (7.38)	$t=1.0$ (168), 0.30
Aggressive behavior	61.06 (10.39)	56.13 (7.27)	$t=3.0$ (168), <0.01
Total score	60.73 (9.18)	59.35 (9.50)	$t=0.9$ (168), 0.39
Internalizing problems	55.40 (10.82)	56.00 (10.11)	$t=0.3$ (168), 0.74
Externalizing problems	59.65 (10.64)	54.35 (9.95)	$t=2.9$ (168), <0.01
ADHD=attention-deficit/hyperactivity disorder; CBCL=Child Behavior Checklist; CSI=Child Symptom Inventory. The public clinics included Pub-Psych, Pub-Peds, and Spc-ADHD-Peds. The private clinics included Pvt-Psych and Pvt-Peds-Neuro.			

Table 3: Results of csi and cbcl scales for public versus private clinics.

Discussion

This study compared differences in sociodemographics and the severity and comorbidity of boys with ADHD in 5 outpatient clinics in Miami, Florida, in a minority population comprised predominantly of Hispanic and African-American patients. Differences were evaluated based on whether the clinics were psychiatric or non-psychiatric and whether they were public versus private. In summary, we had several key findings from our study. The severity of ADHD symptoms in the

psychiatric versus non-psychiatric group was not statistically different. Subjects in the public clinics had greater severity of hyperactive and combined subtypes of ADHD compared to subjects in private clinics. Subjects in the psychiatric group had greater severity of symptoms of conduct disorder, generalized anxiety, and major depression compared with the non-psychiatric group. Subjects in the public clinics had greater severity of symptoms of social phobia compared to subjects in private clinics. No significant differences were noted in the severity of maladaptive behavioral and emotional problems (as measured by

CBCL) in psychiatric versus non-psychiatric settings and public versus private settings.

Children and families in the public psychiatric clinic presented more markers of socioeconomic disadvantage than those in the private hospital clinics. These included more children living in single-parent homes, lower socioeconomic status, and the largest number of children attending special education classes. The children in the general pediatric clinic at the public hospital had a very similar profile to those in the public psychiatric clinic. These findings are consistent with those of other studies that compared public with private clinic samples [36]. Similar to another study, the current findings raise questions as to whether children with more socioeconomic disadvantage are at a higher risk of long-term negative outcomes of ADHD [37].

The comparison between psychiatric and non-psychiatric clinics demonstrated that children in the psychiatric clinics were significantly older and had a longer diagnosis of ADHD compared with the non-psychiatric clinics. Children in the psychiatric sample experienced more severe conduct disorder, anxiety, and depression, and trends were noted for ADHD, impulsivity, previously undetected diagnoses of Asperger's syndrome and autistic disorders, and more aggression, social problems, and externalizing behaviors. To a lesser degree, children in the non-psychiatric sample also had multiple types of comorbidities and similar social problems. These results are consistent with Busch et al. [29], whose findings contradicted previous studies that showed non-psychiatric samples as less compromised than psychiatric samples [1,26-29].

When the sample was divided to compare public clinics to the private clinics, the public hospital sample had more severe ADHD, social phobia, aggressive behavior, externalizing behaviors, and attention problems. These findings serve to highlight that this treatment model needs to include wraparound services with more psychosocial and family interventions, such as the use of case managers. This particular model of treatment intervention has proven effective and necessary for children and families with socioeconomic disadvantage in which members of minority groups tend to be over-represented [38-40].

This study has some methodological shortcomings that may prevent the findings from being more generalizable. First, the population of Miami-Dade County (Greater Miami), Florida, is predominantly Hispanic. Also, African-American patients were over-represented and white patients were under-represented in this study. Because of this patient population, the sample may not be representative of the rest of the United States or generalizable to other parts of the country. Second, the CSI has good validity and reliability, but may not be as comprehensive as other instruments used in epidemiological studies. However, this instrument was used partly to demonstrate that it could be accurate and user-friendly in a primary care setting. Finally, the children in the 5 samples represented members of a clinic population already diagnosed and engaged in active treatment for ADHD. Therefore, these findings will be different from community samples.

Conclusion

Our study indicates that even though the levels of severity and comorbidity of ADHD were greater in the psychiatric clinic sample, the children seen in the pediatric clinic settings had similar ADHD severity and similar comorbidity to the psychiatric clinics. The fact that comorbid diagnoses of the children in the non-psychiatric sample may be inadequately identified and treated places these children at greater

risk for developing long-term negative outcomes associated with ADHD, such as substance abuse and mood disorders [1,24,41-43] and lower academic functioning [43]. This study also highlights the differences in severity and comorbidity of ADHD and the socioeconomic disadvantages that are present among minority children and families treated in public clinics compared to those who are treated in private clinics. The higher levels of severity, comorbidity, and social disadvantage encountered in the children in the lower socioeconomic status sample raises the need for more comprehensive, wrap-around services to these families [1,13,38-40,43]. Larger samples of children treated by primary care physicians and psychiatrists need to be analyzed to determine whether the comorbidities that usually accompany ADHD are being appropriately diagnosed and appropriately treated with the correct treatment regimens.

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