Research Article

CHILD ANXIETY IN PRIMARY CARE: PREVALENT BUT UNTREATED

Denise A. Chavira, Ph.D.,[1]* Murray B. Stein, M.D., M.P.H.,[1] Kelly Bailey, M.A.,[2] and Martin T. Stein, M.D.[3]

We present prevalence and treatment utilization rates for child anxiety disorders in a university-affiliated primary care clinic. Families were recruited from a pediatric patient list and 714 families participated in an initial study wherein they completed child anxiety questionnaires. According to parent and child self-report questionnaires (n = 714), 22% and 20% of children, respectively, were above a suggested clinical cutoff on a brief anxiety screen; 19% and 14% of children exceeded clinical cutoffs on a separate social anxiety questionnaire. All families were invited to participate in a second study that included the Anxiety Disorders Interview Schedule for Children-Parent Version and questions about treatment utilization; telephone interviews with 190 parents showed 1-year prevalence rates of DSM-IV child disorders to be 10.0% (se = 2.2%) for specific phobia, 6.8% (se = 1.8%) for social phobia, 3.2% (se = 1.3%) for generalized anxiety disorder, 0.5% (se = .7%) for selective mutism, 1.6% (se = .9%) for major depressive disorder, 1.1% (se = .7%) for dysthymia, and 12.6% (se = 2.4%) for attention deficit–hyperactivity disorder (ADHD). Among children with a current anxiety disorder, 31% had received counseling or medication treatment during their lifetime, compared to 40% of children with depression and 79% with ADHD. Adolescent age and being Caucasian were predictors of psychotherapy use; having an ADHD diagnosis was a predictor of both psychotherapy and medication use. The high prevalence of impairing anxiety disorders, in concert with the very low extent of treatment utilization, suggests a need for methods to identify and disseminate empirically validated treatments for these disorders in the primary care setting. Depression and Anxiety 20:155–164, 2004. © 2005 Wiley-Liss, Inc.

Key words: *prevalence; primary care; child; anxiety; treatment utilization*

[1]Department of Psychiatry, University of California San Diego, La Jolla, California
[2]Department of Psychology, San Diego State University, San Diego, California
[3]Department of Pediatrics, University of California San Diego, La Jolla, California

*Correspondence to: Dr. Denise A. Chavira, University of California San Diego, Department of Psychiatry, 8950 Villa La Jolla Drive, Suite C-207, La Jolla, CA 92037.
E-mail: dchavira@ucsd.edu

INTRODUCTION

Previous prevalence studies conducted in primary care demonstrate that child DSM-III and DSM-III-R psychiatric disorders are common in this setting. Rates of any psychiatric disorder range from 9–22% [Costello, 1989; Lavigne et al., 1996] and extend to 42% when children with subthreshold diagnoses are included [Costello and Shugart, 1992]. Although much of the child primary care literature has focused on detecting and treating behavioral problems such as ADHD, epidemiologic findings show that anxiety disorders are also remarkably common in this setting. In the hallmark study by Costello [1989], weighted 1-year prevalence rates of anxiety disorders among

children 7–11 years old, ranged from 1.0–9.1% (simple phobia = 9.2%; separation anxiety = 4.1%; overanxious disorder = 4.6%; avoidant disorder = 1.6%; social phobia = 1.0%). According to parent report, the rate of any anxiety disorder was 6.6%; based on child's report the rate rose to 10.5%. More recently, Briggs-Gowan et al. [2000] reported a rate of 6.1% for child anxiety disorders in a primary care sample of 5–9 year olds (simple phobia = 2.8%; separation anxiety = 3.6%; overanxious disorder = 0.5%). In a case control study of children (6–18 years old) with and without ADHD in a primary care setting [Busch et al., 2002], lifetime rates of anxiety disorders in the control group were 4% for overanxious disorder, 8% for specific phobia, 3% for social anxiety, 6% for separation anxiety, 2% for obsessive compulsive disorder, 1% for agoraphobia, and 0% for panic disorder and posttraumatic stress disorder. Among children with ADHD, the rates of anxiety disorders were much higher. Other studies have found somewhat lower rates, particularly in preschoolers [Kramer and Garralda, 1998; Lavigne et al., 1996] where methodological and diagnostic issues are common. Overall, however, the not inconsiderable prevalence of anxiety in pediatric primary care remains evident. To the best of our knowledge, data presenting the prevalence of DSM-IV child anxiety disorders in a primary care setting are not yet available.

Differences in prevalence rates across studies often arise because of methodological factors, such as varying diagnostic criteria or changing levels of interference used to delimit "clinical significance." For example, in a community sample, rates of any anxiety disorder dropped from 21% to 7.7% when a measure of global impairment was applied and rates were reduced further when disorder-specific impairment was also required [Shaffer et al., 1996]. Based on independent estimates from parent and child, 6.8% and 23.4% of children from primary care settings had a subthreshold-level anxiety disorder when symptom, duration, and severity criteria were more lenient whereas 6.6% and 10.5% of children had a clinical level anxiety diagnosis when more conservative (i.e., strict) criteria were applied [Costello and Shugart, 1992]. Although the optimal threshold for clinical significance remains somewhat arbitrary, different thresholds may serve different purposes. Low thresholds may be important for identifying children who are at risk for psychopathology whereas higher thresholds may identify children who are in need of more immediate treatment. The current study presents prevalence rates using both high and low impairment thresholds. We use the term "clinical-level" to describe disorders that meet all diagnostic criteria and are associated with a lot of impairment (i.e., a high impairment threshold). Alternatively we use the term "subthreshold" to describe symptoms that meet diagnostic criteria but are associated only with impairment that is mild to moderate and infrequent (i.e., a low impairment threshold).

According to previous estimates, 70% of youth visit a pediatrician at least once per year [Gans et al., 1991] and approximately 25% of families present with psychiatric concerns [Costello et al., 1988]. Recent data suggest that detection rates of psychiatric problems in primary care are increasing [Kelleher et al., 2000], but despite increasing rates of detection, there remains a significant gap between the number of children who need mental health services and those who actually receive appropriate care. In two separate studies, only 40–50% of children with a diagnosable disorder received a referral to a mental health professional, medication, or counseling [Costello, 1989; Costello et al., 1988; Lavigne et al., 1993]. Of those children who are identified and receive a mental health referral, many do not follow up with treatment [Rushton et al., 2002] (or do not have access to treatment) and instead rely on their primary care provider for management of such concerns.

At present, disproportionately more children with externalizing disorders receive treatment when compared to children with internalizing disorders, particularly in public sectors [Garland et al., 2000]. Within the primary care setting, the most frequently recognized problems include family problems, behavioral issues (e.g., enuresis and temper tantrums), cognitive language problems, learning disabilities, and attention problems [Horwitz et al., 1992]. The primary care setting having greater access and potential for developmental assessment seems ideally situated to detect and possibly address mental health problems, including anxiety disorders.

The goal of the current study is to provide a glimpse into the prevalence of commonly occurring childhood anxiety disorders and comorbid conditions in the primary care pediatric setting using contemporary diagnostic criteria. We also demonstrate the sensitivity of prevalence rates to various impairment thresholds. We provide a brief overview of mental health utilization in this sample.

PARTICIPANTS AND METHODS

Families were selected from a list of pediatric patients who had been seen by their physician in the past year. Approximately 1,430 families with children between the ages of 8–17 were selected randomly and anxiety questionnaires were mailed to these residences by the providing clinic; 297 packets were deemed ineligible (i.e., wrong addresses or outside our age criteria), resulting in an adjusted eligible sample of 1,173 families. Of these 1,173 families, 714 parents and children (61%) completed the anxiety questionnaire packets. Data in this first study were gathered to attain prevalence rates of anxiety symptoms in a community sample based on self-report instruments. Parents and children were asked to complete the initial questionnaires, for which they received a $10 book certificate, and to indicate interest in the follow-up study

presented in the current article by checking a box on the demographic form and providing their name, phone number, and address.

Of those 714 families who completed the initial questionnaires, 359 expressed interest in the follow-up study, which included a telephone interview with the parent and supplemental questionnaires addressing attitudes toward treatment and social functioning. Only those 359 families who expressed interest in the second study and provided consent to contact were mailed a consent form; 190 families completed the consent forms (i.e., parental consent and child or adolescent assent), questionnaires, and the telephone interview. An additional 23 families completed the consents and questionnaires only. Families received $25 for their participation in the follow-up study. Diagnostic and treatment utilization data derived from the semi-structured interviews are the focus of the current study. Both studies were approved by the Human Research Protection Program at our University.

PARTICIPANTS

The mean age of the parents completing the interview was 43.95 ($sd = 6.03$) years (age range = 24–75 years old). Most parent participants had a college education (74%) and were Caucasian-American (71%). The ethnic composition of the non-Caucasian parent sample included Latinos/Hispanic-Americans (7%), African-Americans (5%), Filipino/Asian-Americans (5%), and individuals who identified as multicultural (9%). Approximately 54% of the child participants were between the ages of 8–12 and 46% were between the ages of 13–17. An equivalent number of boys (49.8%) and girls (50.2%) participated in the study.

MEASURE

The Social Anxiety Scales. The Social Anxiety Scale-Children Revised (SASC-R) [La Greca et al., 1988] and Social Anxiety Scale-Adolescents (SAS-A) [La Greca and Lopez, 1998] were used to assess levels of social anxiety with regard to peer relations. A 5-point Likert scale is used and total scores range from 1–90 for the social anxiety items. Adequate psychometric properties have been established in both clinical and non-clinical samples [Ginsburg et al., 1998; La Greca and Stone, 1993]. Clinical cutoffs ranging from 50–54 (depending on gender and age group) have been suggested to identify high socially anxious children and adolescents [La Greca and Lopez, 1998; La Greca and Stone, 1993]. The SASC-R and SAS-A both have three subscales (FNE, fear of negative evaluation; SAD-New, social avoidance and distress in new situations; and SAD-General, social avoidance and distress in general). Subscale scores are used frequently; however, total scores are appropriate when attempting to identify clinical levels of social anxiety [La Greca, 1998]. Internal consistency estimates range 0.80–0.94

for the FNE subscale; 0.66–0.87 for the SAD-New subscale, and 0.60–0.80 for the SAD-General subscale in community and clinic samples [Ginsburg et al., 1998; La Greca et al., 1988; La Greca and Stone, 1993; La Greca and Shiloff, 1998]. Test–retest estimates for the scales ranged from 0.63–0.75 for FNE, 0.61–0.75 for SAD-New, and 0.51–0.47 for SAD General, using 2, 4, and 6 month intervals [La Greca et al., 1998; Vernberg et al., 1992]. Concurrent validity has been established with other popular measures of social anxiety [Morris and Masia, 1998] and in a clinic sample, adolescents with social anxiety disorder reported greater SAS-A scores than did adolescents with other anxiety disorders [Ginsberg et al., 1998]. Both the parent and child versions were mailed to families.

Anxiety Scale. The Screen for Child Anxiety Related Emotional Disorders (SCARED-5 item) [Birmaher et al., 1997, 1999] was completed by parents and children. The 5-item SCARED is derived from the 41-item SCARED, which has good psychometric properties and assesses various types of childhood anxiety including generalized anxiety disorder, separation anxiety disorder, panic disorder, social anxiety disorder, and school phobia. A 3-point Likert scale is used and total scores range from 0–10. The original SCARED is reported to have moderate parent child agreement ($r = 0.20$–0.47), internal consistency estimates ranging from 0.74–0.93, and test–retest estimates ranging from 0.70–0.90 [Birmaher et al., 1997]. The SCARED was also able to discriminate between anxiety disorders and other disorders as well as within anxiety disorders [Birmaher et al., 1997, 1999]. The five-item scale was created by selecting the one item from each of the five factors with the highest loading in a discriminant function analysis. The 5-item SCARED is reported to have similar psychometric properties as the original scale; scores of 3 or greater differentiate children with anxiety disorders from children with no anxiety disorders [Birmaher et al., 1999]. Both the parent and child versions were mailed to families.

INTERVIEW

Anxiety Disorders Interview Schedule for Children. The Anxiety Disorders Interview Schedule for Children-Parent Version (Silverman and Albano, 1996) is a semi-structured diagnostic interview designed to assess DSM-IV childhood anxiety disorders as well as depressive and behavioral disorders. The following modules were included in this study: school refusal, separation anxiety disorder, social anxiety disorder, specific phobia, generalized anxiety disorder, obsessive compulsive disorder (OCD), dysthymia, major depression (current and past), selective mutism, and ADHD. Due to time constraints, we did not include posttraumatic stress disorder (PTSD), panic disorder, agoraphobia, conduct disorder, or oppositional defiant disorder. Published κ coefficients for the ADIS-C/P disorders are 0.88 for separation anxiety, 0.86 for social

anxiety disorder, 0.65 for specific phobia, 0.72 for generalized anxiety disorder, and 1.00 for ADHD [Silverman et al., 2001].

The ADIS uses an 8-point scale to assess impairment; scores of 4 or greater reflect at least "some" impairment. Parents were asked to give a rating of interference and to describe whether the child experienced impairment at home, in school, in friendships, or in some other way. In the current study, individuals were given a clinician rating of 4 or 5 if the parent reported "some" impairment in one domain of functioning. The presence of such impairment was particularly common in individuals with specific fears and circumscribed public speaking fears where impairment was often focal and infrequent. Interference ratings of 6 or greater were deemed as more consistent with clinical levels of interference and with a need for mental health treatment. More specifically interference ratings of 6 or 7 were associated with "a lot" of impairment and a rating of 8 was consistent with the maximum "very very much" term. Clinician ratings of interference incorporated parent report, clinician judgment, and were informed further by consensus meetings that were held on a biweekly basis. As mentioned previously, the presence of all diagnostic criteria and significant impairment (as defined by a severity rating of at least 6) was used to identify the presence of a clinical disorder.

A section on treatment utilization was administered at the end of the interview. Parents were asked yes–no questions about treatment received for anxiety, depression, and behavioral problems during the child's lifetime. Positive responses to treatment received were followed by questions about duration and type of treatment.

RESULTS

REPRESENTATIVENESS OF THE SAMPLE: RESPONDERS VERSUS NONRESPONDERS

There were no significant differences in child's gender, age group, parental level of education, or child- or parent-reporting of anxiety severity between participants who completed the initial questionnaires only ($n = 524$) and those who completed both the questionnaires and interview ($n = 190$). More Caucasians than non-Caucasians completed both the interview and questionnaire studies [χ^2 (1, $n = 676$) = 3.04, $P < .08$] but this χ^2 was not statistically significant at $P < .05$. Importantly, anxiety scores and social anxiety scores were not significantly different between those who did and did not participate, suggesting that response biases based on anxiety levels were largely absent in this study (Table 1).

INTERVIEW RELIABILITY

Interviews were audiotaped and reliability data were gathered on 42 ADIS-C/P interviews. Inter-rater reliability was estimated by having the second rater listen to the audiotaped interviews and assign diagnoses blind to those of the first rater. The κ coefficients were as follows: specific phobia = 0.77, generalized anxiety disorder = 0.90, attention deficit hyperactivity disorder = 0.93, generalized social anxiety disorder = 1.00, 1.00, nongeneralized social anxiety disorder = 1.00, and major depression = 1.00. Due to small sample sizes κ coefficients were not calculated for the remaining disorders.

CLINICAL ANXIETY AS DEFINED BY SELF-REPORT SCALES AND SEMI-STRUCTURED INTERVIEW

According to parent and child self-report questionnaires ($n = 714$), 22% and 20% of children, respectively, were above a suggested clinical cutoff on the SCARED whereas 18% and 12% of children exceeded clinical cutoffs on the SAS-C/SAS-A social anxiety questionnaires. Table 2 presents 12-month prevalence rates, as derived from the ADIS telephone interviews, with standard errors according to varying levels of impairment. Approximately 17% of children ($n = 32$) presented with a clinical-level anxiety disorder and 28% ($n = 53$) presented with one or more of the disorders assessed in the study (i.e., anxiety disorder, depressive disorder, or ADHD). Among the children with anxiety disorders, 28% had more than one psychiatric disorder and 19% had a comorbid anxiety disorder. The most common disorder in this sample

TABLE 1. Anxiety and social anxiety scores among responders and nonresponders

Anxiety scale	Score (mean ± sd)		F	P
	Responders ($n = 190$)	Nonresponders ($n = 524$)		
SAS-Parent	40.02 ± 12.31	40.03 ± 11.51	0.000	.991
SCARED-Parent	1.44 ± 1.65	1.53 ± 1.67	0.48	.488
SASC-R-Child	37.12 ± 12.36	35.98 ± 11.18	1.59	.208
SCARED-Child	1.64 ± 1.72	1.66 ± 1.65	0.015	.993

N = 714.
SAS, Social Anxiety Scale-Parent Report; SCARED, Screen for Anxiety and Emotional Related Disorders-Parent Report; SASC-R, Social Anxiety Scale for Children Revised-Child report; SCARED, Screen for Anxiety and Emotional Related Disorders-Child Report.

TABLE 2. One-year prevalence rates: varying the threshold of impairment

Disorder	IMPAIR ≥ 4[a]		IMPAIR ≥ 6[b]		IMPAIR ≥ 8[c]		x^2 ($df=1$) equality of proportions[d]
	Rate ± se (%)	n	Rate ± se (%)	n	Rate ± se (%)	n	
SEP	2.6 ± 1.2	5	0 ± 0	0	0 ± 0	0	0.13
SOC	18.9 ± 2.8	36	6.8 ± 1.8	13	1.1 ± 7.2	2	4.96*
SPECIFIC	2 0 ± 2.9	38	10 ± 2.2	19	2.6 ± 1.2	5	4.22*
GAD	9.5 ± 2.1	18	3.2 ± 1.3	6	0 ± 0	0	1.21
OCD	1.1 ± 0.7	2	0 ± 0	0	0 ± 0	0	NE
SEL MUTISM	1.1 ± 0.7	2	0.5 ± 0.5	1	0.5 ± 0.5	1	NE
ADHD	1 5 ± 2.6	29	12.6 ± 2.4	24	1.6 ± 0.9	3	0.71
MDD	2.6 ± 1.2	5	1.6 ± 0.9	3	0.5 ± 0.5	1	0.05
DYS	1.6 ± 0.9	3	1.1 ± 0.7	2	0 ± 0	0	NE
MDD or DYS	4.2 ± 1.5	8	2.6 ± 1.2	5	0.5 ± 0.5	1	0.13
ANX, ADHD, or MDD/DYS	44.7 ± 3.6	85	27.9 ± 3.3	53	5.3 ± 1.6	10	17.16**
ANX	35.3 ± 3.5	67	16.8 ± 2.7	32	4.2 ± 1.5	8	15.21**

N = 190.
[a]At least "Some" or more (subthreshold).
[b]At least "A Lot" or more (clinical level).
[c]Very, very much.
[d]Change in prevalence using different thresholds of impairment (subthreshold versus clinical; see Appendix 1).
*$P<.05$; **$P<.01$.
IMPAIR, impairment rating from AIDS; se, standard error; SEP, Separation Anxiety Disorder; SOC, social phobia; SPECIFIC, specific phobia; GAD, Generalized Anxiety Disorder; OCD, Obsessive–Compulsive Disorder; SEL MUTISM, selective mutism; ADHD, Attention Deficit Hyperactivity Disorder; MDD, Major Depressive Disorder (current); DYS, dysthymia; ANX, any of the assessed anxiety disorders; NE, not estimated (<5 participants).

was ADHD (12.6%) followed by specific phobia (10.0%) and social phobia (6.8%). When low impairment thresholds were applied, rates of any psychiatric disorder and any anxiety disorder were 44% and 35%, respectively. Adjustments to the impairment threshold most significantly impacted the anxiety disorders, reducing the rates of social phobia, specific phobia, and generalized anxiety disorder by at least 50%. As shown in Table 2, χ^2 tests for equality of proportions were used to examine the effect of requiring a "clinical" threshold for impairment. The formula, $\chi^2 = n * p/(1-p)$ with 1 df [Fleiss, 1981] (see Appendix 1 for a full derivation of this formula) was applied, where n = number of children meeting criteria for a given anxiety disorder using a low threshold of impairment and p = the difference between the proportion of children meeting criteria with the low threshold of impairment (subthreshold) and the proportion of individuals meeting criteria using a clinical level ("a lot") of impairment. This analytic technique has been used in previous studies where impairment thresholds were adjusted and rates were compared [Romano et al., 2001]. In this study, the inclusion of a stricter impairment threshold significantly reduced prevalence rates for social phobia and specific phobia.

There were no gender differences across disorders except for ADHD [χ^2 (1, $n=190$) = 5.04, $P < .05$]. Boys had more ADHD diagnoses than girls did (8.9% versus 3.7%). There was not an age (i.e., younger children and adolescents) or ethnic difference (Caucasian and non-Caucasian) in the distribution of dis-

orders across groups (data not shown). Ethnic groups were combined due to small sample sizes.

TREATMENT UTILIZATION

Based on the sample of 190 telephone interview participants, approximately 35% ($n=66$) of children in our sample had received at least three sessions of counseling for problems such as anxiety, depression, ADHD, anger, enuresis, learning disabilities, sleep difficulties, or family issues at some point in their lifetimes. Hierarchical logistic regression analyses were conducted to examine how various demographic characteristics and DSM-IV disorders (for categories that had at least five individuals) were related to treatment utilization (i.e., counseling/psychotherapy and psychotropic medication use) (Table 3). Gender, ethnicity, educational level, and age group were entered on the first step, and social anxiety disorder, specific phobia, generalized anxiety disorder, depressive disorders, and ADHD were included on the second step. The overall model for lifetime psychotherapy use was significant, [χ^2 (9, 185) = 28.02, $P < .001$]; age group (adolescents), ethnicity (Caucasian), and ADHD were associated with an increased odds ratio (OR) of a lifetime history of counseling. The model for lifetime psychotropic medication use was also significant [$\chi2$ (9, 185) = 59.78, $P < .001$]. ADHD was the only variable associated with an increased OR of psychotropic use. The effect of comorbidity (i.e., presence of two or more disorders) was also assessed in two separate

TABLE 3. Associated odds ratios between demographic variables, DSM-IV diagnoses, and lifetime treatment utilization

Parameter	OR	95% CI	*P*
Psychotherapy			
Step 1			
Gender	0.68	0.35–1.35	.27
Ethnicity (Caucasian/not Caucasian)	0.43	0.18–1.01	.05
Education (college degree/no college degree)	0.74	0.35–1.60	.45
Age group (children/adolescents)	2.93	1.48–5.80	.002
Step 2			
Social anxiety disorder	4.15	0.96–17.93	.06
Generalized anxiety disorder	4.48	0.61–32.88	.14
Specific phobia	1.16	0.36–3.75	.80
Depressive disorders	0.18	0.02–1.74	.14
Attention deficit hyperactivity disorder	3.35	1.22–9.18	.02
Psychotropic medication use			
Step 1			
Gender	1.91	0.59–6.12	.28
Ethnicity (Caucasian/not Caucasian)	1.91	0.51–7.09	.34
Education (college degree/no college degree)	1.61	0.43–6.12	.48
Age group (children/adolescents)	2.77	0.87–8.81	.08
Step 2			
Social anxiety disorder	0.35	0.03–3.77	.39
Generalized anxiety disorder	0.00	0.00	.83
Specific phobia	1.77	0.32–9.77	.52
Depressive disorders	0.90	0.06–14.26	.94
Attention deficit hyperactivity disorder	76.40	18.26–319.63	.001

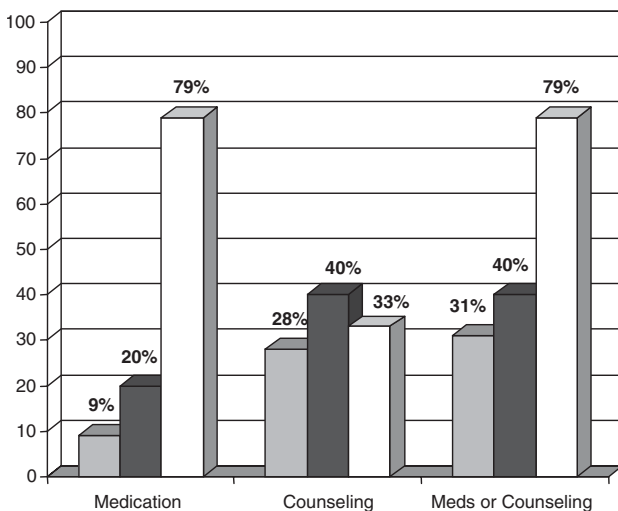OR, odds ratio; 95% CI, 95% confidence interval.

Figure 1. Treatment (for target disorder) ever received by pediatric patients with anxiety, depression, or ADHD during the past year, relative to participants who did not receive treatment for target disorder. Light gray bars, anxiety; black bars, depression; white bars, ADHD.

logistic regressions, but was not a significant predictor of either medication use or psychotherapy use (data not shown).

Problem-specific counseling and medication utilization rates are presented in Figure 1. All children with anxiety, depression, or ADHD treated with medications had either received selective serotonin reuptake inhibitors or stimulant medications. No parents reported that their child had received benzodiazepines, MAOI, tricyclics, or other antidepressant agents for these conditions. Among those children with a clinical level anxiety disorder during the past year, 31% had received some type of counseling or medication for anxiety-related problems. Approximately 40% of children with past-year depressive disorders had received counseling or medication for depression and 67% of children with a lifetime history of a depressive disorder had received services. Among children with a current ADHD diagnosis, 79% had received counseling or stimulant medication for ADHD.

DISCUSSION

DSM-IV childhood anxiety disorders are highly prevalent even outside of mental health settings. In the current study, the rate of anxiety disorders in a primary care setting was 35% when only a mild–moderate level of impairment was required. When a stricter criterion for disorder specific impairment was required (i.e., at least "a lot" of impairment), the rate dropped to 17%, which although high, is broadly consistent with findings from community samples. Kashani and Orvaschel [1988] reported a 6-month prevalence rate of 17.3% for any anxiety disorder, 7.3% for overanxious disorder, and 7.0% for separation

anxiety disorder among adolescents. Reinherz et al. [1993] found a lifetime prevalence of 22.8% for social and simple phobia, 6.3% for PTSD, and 2.1% for OCD among 18 year olds. In the Bremen Adolescent study, a rate of 18.6% was found for a lifetime history of at least one anxiety disorder, the most common being phobias [Essau et al., 2000]. It is likely that prevalence rates would have been lower had we used a global assessment of impairment [Canino et al., 2004], and further reduced had we coupled global impairment with diagnosis-specific impairment.

Further paralleling findings from other epidemiological studies of child psychiatric disorders in community samples, varying the threshold of impairment had the greatest impact on reducing rates of internalizing disorders such as simple phobias and social phobia [Romano et al., 2001; Shaffer et al., 1996; Simonoff et al., 1997]. Less stringent impairment thresholds may be more likely to capture individuals with internalizing disorders given that these symptoms (e.g., social fears and specific fears) are frequently less noticeable and outwardly disruptive. Similarly the boundary is often blurred when differentiating pathological social fears from normative social concerns or when identifying clinically significant impairment, inevitably leading to a large number of childhood fears that are referred to as subthreshold.

It was particularly noteworthy that anxiety disorders were the most prevalent, yet least often treated psychiatric condition. Families of children who had ADHD or depressive disorders had obtained counseling more often than did families of children with anxiety disorders, although the rate of treatment utilization for children with depressive disorders was also considerably low. Overall, 72% of children with an impairing anxiety disorder had not received any kind of counseling. Still fewer individuals with anxiety (9%) had received medication treatment when compared to individuals with current depressive disorders (20%) and individuals with current ADHD (79%). Families most often received treatment for ADHD and somewhat less often for problems such as depression and anxiety. Logistic regression analyses supported these descriptive findings. ADHD was the only DSM-IV disorder associated with increased use of counseling/psychotherapy and psychotropic medication. Once again, it may be that families do not perceive internalizing behaviors to be as serious or disruptive, despite endorsing a diagnosis of clinically significant impairment for their child. Also, pediatricians may be less aware of efficacious therapeutic options for child anxiety disorders and therefore less likely to encourage treatment. Furthermore, there may be more systemic barriers that families encounter when seeking treatment for anxiety disorders (e.g., access, insurance coverage). The explanation for this gap between prevalence and treatment requires additional study.

Other significant predictors of psychotherapy use included ethnicity (Caucasians) and age of child (adolescent). Although findings from studies are inconsistent, some data support that ethnic minorities are less likely to receive counseling and psychotropic medication when compared to Caucasians [Kataoka et al., 2002; Lavigne et al., 1998; Rushton and Whitmire, 2001; Zito et al., 2003]. These patterns of utilization are often explained by differences in treatment acceptability, stigma, detection, and help-seeking behaviors across ethnic groups. In a study exploring parental beliefs about the causes of child mental health problems, it was found that parents of ethnic minority youths were generally less likely than parents of non-Hispanic Caucasians to endorse biopsychosocial etiologies and more likely to report sociological causes (e.g., friends, American culture, prejudice, economic problems); a pattern that may make ethnic minority parents less likely to seek mainstream mental health services or may lead to conflict when they are met with services that espouse biopsychosocial explanatory models [Yeh et al., 2004]. The increased likelihood for adolescents to have received psychotherapy may be attributed to the fact that we assessed lifetime utilization. It may also be that families become more likely to seek services if a child's problem has persisted over a significant period.

The gap between prevalence and treatment utilization for anxiety disorders is apparent and worrisome for several reasons. First, longitudinal studies with clinical and community samples suggest that anxiety disorders during youth are associated with risk for later (i.e., chronic) anxiety, major depression, and substance abuse [Costello et al., 2003; Essau et al., 2002; Pine et al., 1998; Stein et al., 2001]. Second, varying forms of childhood anxiety are associated with educational underachievement, low self-esteem, and loneliness [Fordham and Stevenson-Hinde, 1999; Van Ameringen et al., 2003; Woodward and Fergusson, 2001]. Third, childhood anxiety may intensify the impact of commonly co-occurring disorders such as ADHD [Jensen et al., 2001]. Efforts to improve identification and treatment delivery seem to be a logical next step to improving short- and long-term outcomes for youth with anxiety disorders.

LIMITATIONS

Although we drew randomly from a complete roster of primary care pediatrics patients and were able to demonstrate that responders and non-responders were not dissimilar on a number of attributes, the generalizability of this study is nonetheless limited. The interviewed sample was relatively small in number, predominantly Caucasian and educated. Another limitation is the fact that diagnoses were based solely on parents' reports. Research shows that whenever parents and children are assessed independently, reports are frequently discrepant [Grills and Ollendick, 2003; Verhulst et al., 1997]; this seems to be true for both internalizing and externalizing disorders although

agreement seems greater for behaviors that are more observable (i.e., externalizing behaviors) [Silverman and Eisen, 1992]. It is possible that rates of anxiety disorders could have been higher, given that children are sometimes cited as better reporters of internal distress [Sourander et al., 1999]. The reporting of some anxiety symptoms (such as social avoidance in social anxiety disorder), however, may be associated with a child's self-presentation concerns and therefore less likely to be disclosed [DiBartolo et al., 1998].

The study also carries the limitations associated with self-report instruments and the use of telephone interviews represents a separate limitation. The psychometric properties of the ADIS-C delivered via telephone to parents have not been investigated. In a study of the comparability of telephone and face-to-face interviews with young adults (24 years old) using the Schedule for Affective Disorders and Schizophrenia for School-Age Children (KIDDIE-SADS) [Chambers et al., 1985], Rohde et al. [1997] found that the reliability was excellent for anxiety disorders and very good for major depressive disorder and substance use disorders.

Lastly, this study is limited by the absence of a structured, comprehensive, reliable assessment of functional impairment. In the current study, as part of the ADIS-C/P interview, parents were asked simply to respond with "yes" or "no" to disorder-specific impairment in different domains of functioning (school, home life, friendships, health) and then to give an overall interference rating for that disorder. Clinical judgment and consensus meetings yielded impairment ratings that reflected absent, subthreshold (mild to moderate impairment), and clinically significant diagnoses. Efforts directed at operationalizing "clinically meaningful" impairment accompanied by standardized self-report assessments reflecting this construct will help to advance the reliability and validity of epidemiological research in this area.

CONCLUSIONS

Childhood anxiety disorders are common in the pediatric primary care setting but frequently go undetected and untreated. Pediatricians are in a challenging position as gatekeepers who bear the onus of identifying and referring children with psychosocial disorders, but simultaneously are met with increasing demands on their time and restricted access to specialty mental health services [Blumenthal et al., 1999; Reid et al., 1996]. The use of brief and valid screening instruments may facilitate this process, but efforts to improve identification raise ethical concerns. Incumbent with increased identification is the increased need for services from a mental health care system that is currently underfunded and overburdened [Stephenson, 2000]. Furthermore, treatments with known efficacy are delivered mostly in specialty clinics and therefore remain difficult to access. Research aimed at improving

identification and detection must be accompanied by efforts to develop interventions that are empirically validated, accessible, and effective across settings. In particular, it may be worthwhile to investigate the effectiveness and acceptability of abbreviated cognitive behavioral strategies to treat anxiety disorders as well as the use of such techniques to augment pharmacotherapy options [e.g., Chavira and Stein, 2002]. Data show that pediatricians are already prescribing a significant proportion of psychotropic medications [Pincus et al., 1998; Rushton and Whitmire, 2001], but medication alone may be less than optimal for some disorders. Studies currently in progress will provide data regarding the efficacy of combined pharmacotherapy and behavioral interventions when compared to monotherapy. Equally important will be studies that attempt to transport efficacious treatments for childhood disorders to primary care settings [Weisz, 2000].

APPENDIX

Derivation of $\chi^2 = n * p/(1-p)$ with 1 df begins with a test of a single binomial.

Test a sample proportion p, against a hypothesized proportion p(h) (i.e., zero).
Use a Z statistic and refer to standard normal zero one tables.
$Z = [p-ph]/$square root of $(p*q/n)]$, where $q = 1-p$.
Setting $ph = 0$; $Z = p/$square root of $(p * q/n)]$ where $q = 1-p$; square root of $[(n*p)/q]$.
Mathematically Z squared equals a χ^2 with 1 df; $\chi^2 = n*p/(1-p)$.

In the current study, n = number of children meeting criteria for a given anxiety disorder using a low threshold of impairment and p = the difference between the proportion of children meeting criteria with the low threshold of impairment (subthreshold) and the proportion of individuals meeting criteria using a clinical level ("a lot") of impairment (e.g., social phobia: n = 36; p = 23/190); 36 * (23/190)/1−(23/190) or, alternatively, 36 * [23/190]/(167/190) = 36 * 23/ 167 = 4.958.

REFERENCES

Birmaher B, Brent DA, Chiappetta L, Bridge J, Monga S, Baugher M. 1999. Psychometric properties of the Screen for Child Anxiety Related Emotional Disorders (SCARED): A replication study. J Am Acad Child Adolesc Psychiatry 38:1230–1236.

Birmaher B, Khetarpal S, Brent D, Cully M, Balach L, Kaufman J, Neer SM. 1997. The Screen for Child Anxiety Related Emotional

Disorders (SCARED): Scale construction and psychometric characteristics. J Am Acad Child and Adolesc Psychiatry 36: 545–553.

Blumenthal D, Causino N, Chang YC, Culpepper L, Marder W, Saglam D, Stafford R, Starfiled B. 1999. The duration of ambulatory visits to physicians. J Fam Pract 48:264–271.

Briggs-Gowan MJ, Horwitz SM, Schwab-Stone M, Leventhal JM, Leaf PJ. 2000. Mental health in pediatric settings: Distribution of disorders and factors related to service use. J Am Acad Child Adolesc Psychiatry 39:841–849.

Busch B, Biederman J, Cohen L, Sayer JM, Monuteaux MC, Mick E, Zallen B, Faraone SV. 2002. Correlates of ADHD among children in pediatric and psychiatric clinics. Psychiatr Serv 53:1103–1111.

Canino G, Shrout PE, Rubio-Stipec M, Bird HR, Bravo M, Ramirez R, Chavez L, Alegria M, Bauermeister JJ, Hohmann A, Ribera J, Garcia P, Martinez-Taboas A. 2004. The DSM-IV rates of child and adolescent disorders in Puerto Rico. Arch Gen Psychiatry 61:85–93.

Chambers WJ, Puig-Antich J, Hirsch M, Paez P, Ambrosini PJ, Tabrazi MA, Davies M. 1985. The assessment of affective disorders in children and adolescents by semi-structured interview: Test–retest reliability of the Schedule for Affective Disorders and Schizophrenia for School-Age Children, Present Episode Version. Arch Gen Psychiatry 42:696–702.

Chavira DA, Stein MB. 2002. Combined psychoeducation and treatment with selective serotonin reuptake inhibitors for youth with generalized social anxiety disorder. J Child Adolesc Psychopharmacol 12:47–54.

Costello EJ. 1989. Child psychiatric disorders and their correlates: A primary care pediatric sample. J Am Acad Child Adolesc Psychiatry 28:851–855.

Costello EJ, Edelbrock C, Costello AJ, Dulcan MK, Burns BJ, Brent D. 1988. Psychopathology in pediatric primary care: The new hidden morbidity. Pediatrics 82:415–424.

Costello EJ, Mustillo S, Erkanli A, Keeler G, Angold A. 2003. Prevalence and development of psychiatric disorders in childhood and adolescence. Arch Gen Psychiatry 60:837–844.

Costello EJ, Shugart MA. 1992. Above and below the threshold: Severity of psychiatric symptoms and functional impairment in a pediatric sample. Pediatrics 90:359–368.

DiBartolo PM, Albano AM, Barlow DH, Heimberg RG. 1998. Cross-informant agreement in the assessment of social phobia in youth. J Abnorm Child Psychol 26:213–220.

Essau CA, Conradt J, Petermann F. 2000. Frequency, comorbidity and psychosocial impairment of anxiety disorders in German adolescents. J Anxiety Disord 14:236–279.

Essau CA, Conradt J, Petermann F. 2002. Course and outcome of anxiety disorders in adolescents. J Anxiety Disord 16:67–81.

Fleiss JL. 1981. Statistical methods for rates and proportions. 2nd Ed. New York: John Wiley & Sons.

Fordham K, Stevenson-Hinde J. 1999. Shyness, friendship quality, and adjustment during middle childhood. J Child Psychol Psychiatry 40:757–768.

Gans JE, McManus MA, Newacheck PW. 1991. Adolescent health care; use, costs, and problems of access. Vol 2. Chicago: American Medical Association.

Garland AE, Hough RL, McCabe KM, Yeh M, Wood PA, Aarons GA. 2000. Prevalence of psychiatric disorders in youths across five sectors of care. J Am Acad Child Adolesc Psychiatry 40:409–418.

Ginsburg GS, La Greca AM, Silverman WK. 1998. Social anxiety in children with anxiety disorders: Relation with social and emotional functioning. J Abnorm Child Psychol 26:175–186.

Grills AE, Ollendick TH. 2003. Multiple informant agreement and the anxiety disorders interview schedule for parents and children. J Am Acad Child Adolesc Psychiatry 42:30–40.

Horwitz SM, Lead PF, Leventhal JM, Forsyth B, Speechley KN. 1992. Identification and management of psychosocial and developmental problems in community-based primary care pediatric practices. Pediatrics 89:480–485.

Jensen PS, Hinshaw SP, Kraemer HL, Newlorn LN, Abikoff HB, March JS, Arnold LE, Cantwell DP, Conners CK, Elliott GR, Greenhill LL, Hechtman L, Hoza B, Pelham WE, Severe JB, Swanson JM, Wells KC, Wigal T, Vitiello B. 2001. ADHD comorbidity findings from the MTA study: Comparing comorbid subgroups. J Am Acad Child Adolesc Psychiatry 40:147–158.

Kashani JH, Orvaschel H. 1988. A community study of anxiety in children and adolescents. Am J Psychiatry 145:960–964.

Kataoka SH, Zhang L, Wells KB. 2002. Unmet need for mental health care among U.S. children: Variation by ethnicity and insurance status. Am J Psychiatry 159:1548–1555.

Kelleher KJ, McInerny TK, Gardner WP, Childs GE, Wasserman RC. 2000. Increasing identification of psychosocial problems: 1979–1996. Pediatrics 105:1313–1321.

Kramer T, Garralda E. 1998. Psychiatric disorders in adolescents in primary care. Br J Psychiatry 173:508–513.

La Greca AM, Dandes SK, Wick P, Shaw K, Stone WL. 1988. The development of the Social Anxiety Scale for Children (SASC): Reliability and concurrent validity. J Clin Child Psychol 17: 84–91.

La Greca AM, Lopez N. 1998. Social anxiety among adolescents: Linkages with peer relations and friendships. J Abnorm Child Psychol 26:83–95.

La Greca AM, Shiloff N. 1998. Social anxiety in adolescents. Agreement between parent and teen. San Diego: Society for Research in Adolescence.

La Greca AM, Silverman WK, Wasserstein SB. 1998. Children's predisaster functioning as a predictor of posttraumatic stress following Hurricane Andrew. J Consult Clin Psychol 66:883–892.

La Greca AM, Stone WL. 1993. Social Anxiety Scale for Children-Revised: Factor structure and concurrent validity. J Clin Child Psychol 22:17–27.

Lavigne JV, Arend R, Rosenbaum D, Binns HJ, Christoffel KK, Burns A, Smith A. 1998. Mental health service use among young children receiving pediatric primary care. J Am Acad Child Adolesc Psychiatry 37:1175–1183.

Lavigne JV, Binns HJ, Christoffel KK, Rosenbaum D, Arend R, Smith K, Hayford JR, McGuire PA. 1993. Behavioral and emotional problems among preschool children in pediatric primary care: Prevalence and pediatricians' recognition. Pediatrics 91:649–655.

Lavigne JV, Gibbons RD, Christoffel KK, Arend R, Rosenbaum D, Binns H, Dawson N, Sobel H, Issacs C. 1996. Prevalence rates and correlates of psychiatric disorders among preschool children. J Am Acad Child Adolesc Psychiatry 35:204–214.

Morris TL, Masia CL. 1998. Psychometric evaluation of the social phobia and anxiety inventory for children: Concurrent validity and normative data. J Clin Child Psychol 27:452–458.

Pincus HA, Tanielian TL, Marcus SC, Olfson M, Zarin DA, Thompson J, Magno Zito J. 1998. Prescribing trends in psychotropic medications: Primary care, psychiatry, and other medical specialties. JAMA 279:526–531.

Pine DS, Cohen P, Gurley D, Brook J, Ma Y. 1998. The risk for early-adulthood anxiety and depressive disorders in adolescents with anxiety and depressive disorders. Arch Gen Psychiatry 55:56–64.

Reid RJ, Hurtado MP, Starfield B. 1996. Managed care, primary care, and quality for children. Curr Opin Pediatr 8:164–170.

Reinherz H, Giaconia RM, Lefkowitz ES, Pakiz B, Frost AK. 1993. Prevalence of psychiatric disorders in a community population of older adolescents. J Am Acad Child Adolesc Psychiatry 32: 369–377.

Rohde P, Lewisohn PM, Seeley JR. 1997. Comparability of telephone and face-to-face interviews in assessing axis I and II disorders. Am J Psychiatry 154:1593–1598.

Romano E, Tremblay RE, Vitaro F. 2001. Prevalence of psychiatric diagnoses and the role of perceived impairment: Findings from an adolescent community sample. J Child Psychol Psychiatry 42:451–461.

Rushton J, Bruchman D, Kelleher K. 2002. Primary care referral of children with psychosocial problems. Arch Pediatr Adolesc Med 156:592–598.

Rushton JL, Whitmire JT. 2001. Pediatric stimulant and selective serotonin reuptake inhibitor prescription trends: 1992 to 1998. Arch Pediatr Adolesc Med 155:560–565.

Shaffer D, Fisher P, Dulcan MK, Davies M, Piacentini J, Schwab-Stone ME, Lahey BB, Bourdon K, Jensen PS, Bird HR, Canino G, Regier DA. 1996. The NIMH diagnostic interview schedule for children version 2.3 (DISC-2.3): Description, acceptability, prevalence rates, and performance in the MECA study. J Am Acad Child Adolesc Psychiatry 35:865–877.

Silverman W, Albano AM. 1996. Anxiety Disorders Interview Schedule for Children using DSM-IV. San Antonio, TX: Psychological Corporation.

Silverman WK, Eisen AR. 1992. Age differences in the reliability of parent and child reports of child anxious symptomatology using a structured interview. J Am Acad Child Adolesc Psychiatry 31:117–124.

Silverman WK, Saavedra LM, Pina AA. 2001. Test-retest reliability of anxiety symptoms and diagnoses with the anxiety disorders interview schedule for DSM-IV: Child and parent versions. J Am Acad Child Adolesc Psychiatry 40:937–944.

Simonoff E, Pickles A, Meyer JM, Silberg JL, Maes HH, Loeber R, Rutter M, Hewitt JK, Eaves LJ. 1997. The Virginia Twin Study of Adolescent Behavioral Development. Influences of age, sex, and impairment on rates of disorder. Arch Gen Psychiatry 54: 801–808.

Sourander A, Helstela L, Helnius H. 1999. Parent-adolescent agreement on emotional and behavioral problems. Soc Psychiatry Psychiatr Epidemiol 34:657–663.

Stein MB, Fuetsch M, Muller N, Hofler M, Lieb R, Wittchen H-U. 2001. Social anxiety disorder and the risk of depression. Arch Gen Psychiatry 58:251–256.

Stephenson J. 2000. Children with mental problems not getting the care they need. JAMA 284:2043–2044.

Van Ameringen M, Mancini C, Farvolden P. 2003. The impact of anxiety disorders on educational achievement. J Anxiety Disord 17:561–571.

Verhulst FC, van der Ende J, Ferdinand RF, Kasius MC. 1997. The prevalence of DSM-III-R diagnoses in a national sample of Dutch adolescents. Arch Gen Psychiatry 54:329–336.

Vernberg EM, Abwender DA, Ewell KK, Beery SH. 1992. Social anxiety and peer relationships in early adolescence: A prospective analysis. J Clin Child Psychol 21:189–196.

Weisz JR. 2000. Agenda for child and adolescent psychotherapy research: On the need to put science into practice. Arch Gen Psychiatry 57:837–838.

Woodward LJ, Fergusson DM. 2001. Life course outcomes of young people with anxiety disorders in adolescence. J Am Acad Child Adolesc Psychiatry 40:1086–1093.

Yeh M, Hough R, McCabe K, Lau A, Garland A. 2004. Parental beliefs about the causes of child problems: Exploring racial/ethnic patterns. J Am Acad Child Adolesc Psychiatry 43:605–612.

Zito JM, Safer DJ, DosReis S, Gardner JF, Magder L, Soeken K, Boles M, Lynch F, Riddle MA. 2003. Psychotropic practice patterns for youth: A 10-year perspective. Arch Pediatr Adolesc Med 157:17–25.