ABSTRACT. Objectives. Selective serotonin reuptake inhibitor (SSRI) prescriptions for children and adolescents have increased greatly in recent years despite a paucity of demonstrated safety and efficacy data and a lack of clear guidelines for use. Our study sought to describe family physician and pediatrician SSRI prescribing patterns for children and adolescents, identify influences on SSRI prescription variations, and describe the use of SSRI within the overall management of depression and other mental disorders in primary care.

Design. A survey was mailed to all 596 active North Carolina general pediatricians and a random sample of 557 family physicians in primary care practice. Family physicians who did not see children in their practice were excluded. The survey instrument consisted of a 4-page questionnaire. Survey items included physician demographics, practice characteristics, general management, volume of pediatric patients with depressive symptoms, prescription of SSRIs for depression and other diagnoses, and potential influences on SSRI prescribing practices. The main outcomes were self-reported physician prescription of SSRIs for children and adolescents. Results were analyzed using χ² comparisons and logistic regression.

Results. The overall response rate was 66% (55% family physicians and 76% pediatricians). Of the physicians, 72% had prescribed an SSRI for a child or adolescent. Depression was the most common reason for prescribing an SSRI; over two thirds of respondents had prescribed an SSRI for depression in a child 18 years of age or younger. Over half of the physicians reported they had prescribed an SSRI for a diagnosis other than depression in a child 18 years of age or younger. Attention-deficit/hyperactivity disorder was the most frequent use cited other than depression, followed by obsessive–compulsive disorder, aggression, eating disorders, and enuresis.

Primary care physicians prescribed SSRIs for adolescents more commonly than for younger children. Only 6% of the respondents had ever prescribed an SSRI for a child younger than 6 years of age. In terms of SSRI prescriptions written for depression in the last 6 months, 32% of the physicians had recently prescribed SSRIs for adolescent patients and 6% for patients younger than 12 years of age. Family physicians were more likely than pediatricians to have recently prescribed SSRIs for adolescent patients (41% vs 26%), but there was no difference in recent SSRI prescriptions for children <12 years of age by physician specialty (4% vs 6%).

Prescription of SSRIs was not associated with decreased use of counseling for treatment of depression, but prescription of SSRIs was associated with decreased use of referrals (63% vs 74%). There was no difference in the use of counseling between family physicians and pediatricians (61% vs 59%). However, pediatricians were more likely to use referrals in their usual approach to depression (77% vs 48%) compared with family physicians.

More family physicians had prescribed SSRIs for pediatric patients compared with pediatricians (91% vs 50%), and more family physicians had prescribed SSRIs in combination with other psychotropic medications (54% vs 31%). For the majority of respondents, SSRI prescriptions constituted most of the medications used to treat childhood depression (75% of family physicians vs 61% of pediatricians). Family physicians were more likely to report a belief in the safety (63% vs 48%) and effectiveness (40% vs 32%) of SSRIs. Only 8% of physicians reported adequate training in the treatment of childhood depression and just 16% were comfortable with the treatment of depression. There were no specialty differences in training for the treatment of childhood depression; however, more family physicians than pediatricians agreed that they were comfortable with the management of childhood depression (22% vs 11%).

In logistic regression analysis of SSRI prescriptions controlling for physician demographics and practice settings, physicians who were more likely to have prescribed an SSRI for a pediatric patient included: family physicians (odds ratio [OR]: 6.5; 95% confidence interval [CI]: 3.7–11.4), physicians who had limited referral availability (OR: 5.9; 95% CI: 2.2–15.7), physicians comfortable with management of depression (OR: 5.4; 95% CI: 1.8–15.8), and physicians who believed in SSRI safety (OR: 2.4; 95% CI: 1.4–3.9) and effectiveness (OR: 2.9; 95% CI: 1.6–5.3). Factors that were not associated with SSRI prescription rates included parental pressures or fears, constraints of managed care, training experience, year of residency, gender, age, practice type, percentage of Medicaid patients, and percentage of managed care patients.

Conclusions. Many primary care physicians, especially family physicians, prescribe SSRIs for children and adolescents. SSRIs have become the primary care physician’s medication of choice for depressed children and adolescents, and SSRIs are also used for other pediatric diagnoses. Despite concerns of inappropriate uses, a number of primary care practices seem to be reasonable: depression is the most common diagnosis cited, adolescents receive SSRIs more often than younger children, and SSRI use does not seem to be a substitute for counseling. However, it is not clear whether adult treatment practices and preliminary pediatric clinical trials gener-
Approximately 500,000 children and adolescents receive a prescription for a new class of antidepressants, the selective serotonin reuptake inhibitors (SSRIs), annually in the United States.1-3 Fluoxetine, paroxetine, and sertraline prescriptions for preschool- and school-aged children tripled between 1993 and 1997.4 Emerging clinical experience, case reports, and research trials indicate promising results for children and adolescents with depression, obsessive–compulsive disorder, and other psychiatric illnesses.5-8 However, the increase in SSRI prescriptions raises several issues. First, there are few age and dosage guidelines for these medications. Prescription practices are primarily based on studies in adults and anecdotal experiences in children.9-11 Second, although SSRIs have a good safety profile in general, SSRIs have a variety of documented side effects in adults and children, and the long-term effects of many psychoactive drugs on the developing pediatric central nervous system are unknown.5,24-26 Finally, although clinical trials have demonstrated benefit for some disorders, long-term outcomes are unknown and may prove suboptimal if SSRIs alone replace multimodal therapy including behavioral and counseling interventions.6

Family physicians and pediatricians care for many patients with mental health needs in the primary care setting without referral to a psychiatrist or specialist.13-15 A significant portion of psychotropic medications for children and adolescents are prescribed by primary care physicians.16-18 However, training, diagnosis, and prescribing philosophies among physicians often vary greatly.19-22 Variations in psychotropic prescription practices have important implications for outcomes, quality, and costs of care.

No studies have described how SSRIs have been incorporated into primary care practice: for which diagnoses SSRIs are prescribed, which age groups of patients receive SSRIs, how SSRIs have affected utilization of counseling and referrals, which physicians have adopted this relatively new treatment option, how prescription practices differ by physician specialty, and what factors are associated with prescription of SSRIs. Our study sought to describe how SSRIs are used in the primary care management of depression and other mental disorders. The study is an initial step to explore this complex, evolving issue.

**METHODS**

**Study Population**

The sample was drawn from the North Carolina health professions license file and included all general physicians and those older than 65 years of age in active primary care practice (n = 595) and a similar number (n = 557) of randomly selected family physicians younger than 65 years of age.

**Survey**

The survey instrument consisted of a 4-page questionnaire. The family physician and pediatrician survey instruments were identical. All questions were specifically limited to patients 18 years of age or younger to minimize family physician reports on adult patients. Items included physician demographics, practice characteristics, general management approaches to depression in children (medication, counseling, referral, and watchful waiting), volume of pediatric patients with depressive symptoms, prescription of SSRIs for depression and other diagnoses, and potential influences on SSRI prescribing practices. Additional variables that we hypothesized might affect SSRI prescription practices included access to referral specialists, managed care pressures, parental demands or fears regarding SSRIs, office time constraints, belief in the safety and effectiveness of SSRIs compared with other treatments, training in management of childhood depression, and comfort with care of depressed pediatric patients. There were multiple response formats in the survey: demographic and practice items were multiple-choice categorical answers and fill-in blanks and attitudinal questions about SSRIs were based on 5-point Likert scales of agreement.

Four outcome variables were obtained from physician recall of past prescribing practices for SSRI medications. The first 2 outcomes dealt with the physician’s lifetime experience prescribing SSRIs to children 18 years of age or younger: 1) ever prescribed an SSRI for depression, and 2) ever prescribed an SSRI for other diagnoses (eg, attention deficit, eating disorders, obsessive–compulsive disorder, conduct disorder/agression, or enuresis). These responses were obtained from a survey item that asked, “Which of the following pediatric diagnoses have you ever treated with an SSRI?” The last 2 outcome variables dealt with the number of SSRI prescriptions physicians had written in the last 6 months for depressed adolescents (age: 12–18 years) and for depressed children (age: <12 years).

**Data Collection**

The initial sample included 1152 physicians (557 family physicians and 595 pediatricians). After a detailed review of the health professions license file, we excluded 136 physicians (46 family physicians and 90 pediatricians) who were identified as subspecialists, administrators, emergency department or inpatient-based physicians, and physicians with primary practice out of the state or no current North Carolina address. Questionnaires were sent to the remaining 1016 physicians (511 family physicians and 505 pediatricians). Surveys were sent by first-class mail accompanied by a personalized cover letter signed by the principal investigator. Two follow-up questionnaires were mailed to nonrespondents at 4-week intervals.

**Data Analysis**

Data were analyzed using χ2 tests to compare the percent of family physicians and pediatricians who had prescribed SSRIs for depression and other diagnoses. Physician use of counseling and referrals was examined by comparing physicians who prescribed SSRIs with physicians who did not prescribe SSRIs. This comparison was also repeated adjusting for family physician and pediatrician specialty differences using adjusted proportions analysis. Next, we examined differences in the perception of SSRIs and...
RESULTS

We received 591 completed surveys from eligible respondents (242 family physicians and 349 pediatricians) and 114 surveys from physicians (67 family physicians and 47 pediatricians) indicating they were retired or were not providing primary care for children (ineligible respondents). Thus, the overall response rate was 66% for the 902 eligible physicians (55% family physicians and 76% pediatricians). Physician and practice demographics for the 591 respondents are shown in Table 1. Family physicians were more likely than pediatricians to be male, solo practitioners, and in rural practice ($P < .05$). Pediatricians estimated a greater percentage of their pediatric patients as being enrolled in managed care and Medicaid.

Prescription of SSRIs

Figure 1 displays the percentage of physicians who reported prescription of an SSRI for a pediatric patient for each diagnosis. Seventy-two percent of the physicians had prescribed an SSRI for a child or adolescent. Depression was the most common reason for prescribing an SSRI; over two thirds of respondents had ever prescribed an SSRI for depression in a child 18 years of age or younger. Over half of the physicians reported they had prescribed an SSRI for another psychotropic medication (ADHD was the most frequent use cited other than depression in a child younger than 6 years of age (1% of family physicians vs 6% of pediatricians; $P = .307$). Only 6% of the respondents had ever prescribed an SSRI for a child younger than 6 years of age (1% of family physicians vs 10% of pediatricians; $P < .001$).

As shown in Fig 1, family physicians were more likely to report prescribing an SSRI for a child 18 years of age or younger for various diagnoses. FP indicates family physician; Ped, pediatrician.

likelihood to report prescribing an SSRI for most diagnoses compared with pediatricians. Overall, more family physicians had prescribed an SSRI for any diagnosis to a pediatric patient (91% vs 58%; $P < .001$). In addition, family physicians were more likely to report prescribing an SSRI in combination with another psychotropic medication (54% vs 31%; $P < .001$).

Primary care physicians prescribed SSRIs for adolescents more commonly than for younger children. In terms of SSRI prescriptions written for depression in the last 6 months, 32% of the physicians had recently prescribed an SSRI for more than 1 adolescent patient (41% of family physicians vs 26% of pediatricians; $P < .001$) and 6% for more than 1 patient younger than 12 years of age (4% of family physicians vs 6% of pediatricians; $P = .307$). Only 6% of the respondents had ever prescribed an SSRI for a child younger than 6 years of age (1% of family physicians vs 10% of pediatricians; $P < .001$).

Although the majority of primary care physicians had prescribed an SSRI in their practice, the volume of prescriptions seems to be relatively small. Only 1% of the physicians had prescribed SSRIs to more than 10 adolescent or pediatric patients in the last 6 months. Of note, <11% of physicians reported seeing more than 10 depressed adolescents or children in the last 6 months (13% of family physicians vs 7% of pediatricians; $P = .04$). Thus, prescription rates may reflect the relatively low volume of pediatric patients seen or identified with depression.

Use of Counseling and Referral With SSRIs

In general, more physicians used counseling often (61%) versus medications often (13%) as an approach to children with depressive disorders. Reported use of SSRIs was not associated with decreased use of counseling as a general management approach to childhood depression. In fact, more physicians who had prescribed SSRIs reported the use of counseling often for general management of pediatric patients with depression (64% vs 52%; $P = .006$). There was

TABLE 1. Primary Care Physician Characteristics

<table>
<thead>
<tr>
<th>Physician Characteristics</th>
<th>Percentage of Family Physicians ($n = 242$)</th>
<th>Percentage of Pediatricians ($n = 349$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age ≥40 y</td>
<td>61</td>
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<tr>
<td>Male gender</td>
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<td>Pediatric patients in managed care (mean)</td>
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<tr>
<td>Pediatric patients in Medicaid (mean)</td>
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<td>Urban</td>
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</table>
Physician Perceptions of SSRIs

A slight majority of physicians believed that SSRIs are safer than other antidepressants for children (54%) and less than half reported belief that SSRIs are the most effective treatment for childhood depression (36%). Family physicians were more likely to report a belief in the safety (63% vs 48%; \( P < .001 \)) and effectiveness (40% vs 32%; \( P = .054 \)) of SSRIs. Of all the medications used in the treatment of childhood depression, most prescriptions were for SSRIs (75% of family physicians vs 61% of pediatricians; \( P < .001 \)). Overall, very few physicians reported adequate training (8%) or comfort (16%) in the management of pediatric patients with depression. There were no specialty differences in training for the treatment of childhood depression; however, more family physicians than pediatricians agreed that they were comfortable with the management of childhood depression (22% vs 11%; \( P = .001 \)). The information sources on the use of SSRIs in children most commonly cited by family physicians and pediatricians were the medical literature and psychiatry colleagues.

Influences on Physician Prescription of SSRIs for Depression

Table 2 displays the logistic regression results for the outcome of “ever prescribed SSRIs for any diagnosis in a child 18 years of age or younger,” controlling for differences in physician demographics and practice settings. In this analysis, family physicians were also more likely to report they had prescribed SSRIs. Other significant factors that were associated with greater likelihood of having ever prescribed an SSRI included: reported comfort with management of depressed pediatric patients, limited access to available referral resources, and belief that SSRIs are safer and more effective than other treatments. Factors that were not associated with SSRI prescription rates included parental pressures or fears, constraints of managed care, training experience, year of residency, gender, age, practice type, percentage of Medicaid patients, and percentage of managed care patients.

**DISCUSSION**

Our results show that most primary care physicians have prescribed SSRIs for pediatric patients; 67% of physicians have prescribed an SSRI for depression and 57% have prescribed an SSRI for a diagnosis other than depression in a child 18 years of age or younger. SSRIs are gaining acceptance and being incorporated into primary care practice, especially among family physicians. In this initial view, many primary care uses of SSRIs for children and adolescents seem to be reasonable; depression is the most common diagnosis cited, adolescents receive SSRIs more often than younger children, and SSRI use does not seem to be a substitute for counseling. However, it is not clear whether adult treatment practices and preliminary pediatric clinical trials generalize to children and adolescents in primary care. The spectrum of mental disorders that present to family physicians and pediatricians, diagnostic classifications, and threshold for treatment may be very different for psychiatrists and other specialists. Future studies must report on the length of SSRI treatment, titration of SSRI dosages, monitoring of adverse medication events or outcomes, quality of counseling and follow-up care, and long-term outcomes of SSRIs in primary care.

Beyond the general trends, some areas deserve additional scrutiny. The prescription of SSRIs for ADHD by 36% of physicians is noteworthy. Although ADHD may often have comorbid psychiatric disorders, the use of SSRIs for the single diagnosis of ADHD has very little research support.2,6 The entry of SSRIs into this arena may complicate the ongoing debate about the wide variation in treatment.17,23 Attention must also be paid to the finding that 40% of respondents have prescribed an SSRI in combination with other psychotropic medications. The trend of combination pharmacotherapy has been noted in psychiatric care.24 Combinations of medications may prove beneficial for some individual patients and disorders, yet there are also important potential drug interactions and adverse events to consider.9,10,25 When multiple psychotherapeutic agents are used by family physicians and pediatricians, and complex patients with comorbid disorders are involved, the limit and scope of primary care must be questioned. The issue of combination prescriptions becomes even more significant given our data that indicate primary care physicians who prescribe SSRIs are less likely to make referrals.
Physician specialty was a significant factor in SSRI prescription practices; family physicians were more likely to have prescribed SSRIs than pediatricians. Family physicians were more likely to have prescribed an SSRI in combination with another psychotropic medication and less likely to use referrals for management of childhood depression. This may reflect past clinical experience with adult patients and a greater belief in safety and efficacy, yet specialty differences remained even after controlling for many of these variables. In studies of antibiotic prescriptions, family physicians were also more likely to prescribe medications. There are important distinctions between family physicians and pediatricians that must be considered as research continues in this area. However, until evidence and guidelines provide standards for appropriate SSRI use and better measures of patient outcomes in mental health are developed, terms such as underuse and overuse will be difficult to operationalize.

In contrast, many physicians (including half of the pediatricians) have never prescribed SSRIs. Reluctance to prescribe SSRIs for children and adolescents may represent a conscious, prudent approach to management until better data and research emerge; however, it may also represent discomfort with mental health issues. More than half of the medications in pediatrics are prescribed off-label without extensive study specifically in children. Off-label use is common practice in more traditional medical areas, yet it seems that other issues are involved in the decision to prescribe or not prescribe an SSRI. Based on the relatively low volume of reported patients seen for depression in our survey and a general lack of adequate training and comfort, we speculate that underdiagnosis of psychosocial problems may play a part in reported SSRI use or lack of use. Mental disorders have historically gone unrecognized and undertreated in primary care; individual physician and specialty variations in the prescription of SSRIs are an important facet of this issue.

SSRI prescriptions in our study were written by physicians who reported a greater belief in the safety of SSRIs, belief in the effectiveness of SSRIs, and self-declared comfort with management of psychiatric disorders. However, a very small minority of physicians reported adequate training and comfort with treatment of childhood depression and related disorders. Research must continue in conjunction with other efforts to improve physician training, continuing education, and overall comfort and proficiency in the care of pediatric mental health issues. In addition, health care system effects outside of primary care influence the prescribing practices of physicians. Physicians who reported a lack of available specialty referral resources were more likely to have prescribed SSRIs. Physician supply, provider distribution, access to specialists, and interactions with referral physicians are very important components of mental health care that must be considered in mental health services.

Our study has some limitations on the generalizability of our findings. The data are limited by potential physician self-reporting biases and reliance on recall. Actual clinical practice may vary from the responses to the items in our survey. Comparisons of primary care physicians in a single state with different providers in different practice settings and states may be limited by variations in the prevalence and severity of mental illness seen in their practice, number of pediatric and adolescent office visits for mental health issues, differential recognition of symptoms and diagnosis of depression and mental illness, and disparate access to specialists and referrals. Finally, our survey focused on treatment issues and did not address the additional complexities of important precursors to treatment, such as recognition, access, and proper diagnosis of mental disorders in children.

CONCLUSION

In summary, SSRIs are becoming viewed as a safe, effective treatment option for pediatric patients and prescribed for a variety of diagnoses by family physicians and pediatricians. Physician specialty, access to referral specialists, physician comfort with the management of mental illness, and other influences on SSRI prescription practices may have important consequences for children. As treatment options expand for physicians and other forces reshape the roles of mental health care providers, primary care physicians must be regarded as an important component of the research agenda and included in studies on the provision of mental health services. These issues must be explored further to determine whether differences in physician SSRI prescription practices translate into different health outcomes for children and adolescents with mental illness.

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*Pediatrics* 2000;105;e82
DOI: 10.1542/peds.105.6.e82

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