Pediatricians' Self-Reported Role in Treating Children and Adolescents With Major Depressive Disorder: A National Random Survey

Andrea R. Pfalzgraf, MPH, PhD; Virginia Scott, RPh, MS, PhD; Eugene H. Makela, PharmD, BCPP; Steven L. Hartsock, LCSW-C, PhD; Jan Kavookjian, MBA, PhD; and Lesley-Ann Miller, MS, PhD

ABSTRACT

Objective: Major depressive disorder (MDD) is a serious US public health problem for children and adolescents. This study explored pediatricians' self-reported role in treating children and adolescents with *DSM-IV-TR* MDD after the 2004 US Food and Drug Administration black-box warning.

Method: A national random sample of pediatricians (N = 2,000) was surveyed from the beginning of November 2007 through the end of January 2008, with a usable response rate of 22.7% (408 of 1,800 deliverable surveys). Descriptive statistics and χ^2 tests were used to analyze the data on treatment versus referral of children and adolescents with MDD and on the proportion of pediatricians in 4 geographic regions who treat children and adolescents with MDD.

Results: The majority of the pediatricians (60.0%, 245 of 408) do not treat either children or adolescents with MDD. Fewer than one-third of the pediatricians (28.2%, 115) reported treating both children and adolescents. The majority of the pediatricians (83.6%, 341) reported referring both children and adolescents to psychiatrists for treatment. The χ^2 tests indicate that the proportion of pediatricians who treat children ($P = .088$) and adolescents ($P = .259$) does not vary significantly according to the 4 geographic regions analyzed (Northeast, South, Midwest, and West).

Conclusions: On the basis of self-report, the majority of US pediatricians do not treat children and adolescents with MDD but instead refer these patients to psychiatrists. In light of the current shortage of child and adolescent psychiatrists in the United States, referral to these specialists may be problematic.

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Corresponding author: *Andrea R. Pfalzgraf, MPH, PhD, Division of Clinical, Social, and Administrative Sciences, Duquesne University, Mylan School of Pharmacy, 600 Forbes Ave, Pittsburgh, PA 15282 (pfalzgrafa@duq.edu).*

Major depressive disorder (MDD) in children and adolescents is a serious public health problem in the United States. Studies indicate that between 10% and 15% of all children and adolescents in the United States show at least some symptoms of depression.[1]

Studies indicate that MDD in children and adolescents is associated with a high degree of morbidity and mortality. It is estimated that 20%–30% of children and adolescents with MDD have substance abuse issues.[2] According to another study,[3] children and adolescents with MDD, compared to normal controls, have a more than 2-fold increased risk of drug or alcohol abuse. Additionally, children and adolescents with MDD tend to experience significantly greater impairment in overall functioning.[3,4] Longitudinal studies indicate that MDD is likely to recur and persist into adulthood. Longitudinal studies following children and adolescents who have been diagnosed with MDD indicate 20% recurrence by the end of 1 year, 60% recurrence by the end of 2 years, and 70% recurrence by the end of 5 years.[5,6] Furthermore, MDD tends to persist into adulthood. Rates of recurrence between 30% and 50% are estimated in children and adolescents with MDD who are observed into adulthood.[6,7]

For all children and adolescents, as age increases, so does the risk of suicide—from a rate of 0.9 in 100,000 for youth aged 10–14 years to 6.9 in 100,000 for adolescents aged 15–19 years.[8] Although not all depressed youth commit suicide, it has been estimated that between 40% and 80% of youth with depression have experienced thoughts of suicide.[9] Furthermore, research indicates that over 30% of those children and adolescents diagnosed with depression will attempt suicide, and at least 7% will take their lives as a result of depression.[5,10] Given the consequences associated with MDD, treatment of children and adolescents with this disorder becomes crucial.

Child psychiatrists are the experts in treating children and adolescents with MDD. According to the American Academy of Child and Adolescent Psychiatry,[11] child psychiatrists undergo 2 years of specialized training beyond that of an adult psychiatrist.

There is, however, a severe shortage of child and adolescent psychiatrists in the United States. Although 30,000 child and adolescent psychiatrists are needed in the United States, according to the Council on Graduate Medical Education, currently there are fewer than 7,500.[12] Thus, other physicians may treat children and adolescents with MDD. The literature does document that children and adolescents receive antidepressant treatment for disorders including depression from other physicians, including pediatricians.[13]

No studies, however, were found that explored the role of pediatricians in treating children and adolescents with MDD after the 2004 US Food and Drug Administration (FDA) black-box warning. Therefore, the purpose of this study was to determine, on a national level, the role of pediatricians in treating children and adolescents with MDD.

The specific objectives of the study were to determine (1) the proportion of pediatricians who treat children and adolescents with MDD, (2) the proportion of pediatricians who refer children and adolescents with MDD, (3) the health care provider(s) to whom pediatricians refer a child or adolescent with MDD, and (4) any geographic differences in pediatricians' willingness to treat versus refer children and/or adolescents with MDD.

Clinical Points

- The majority of US pediatricians do not treat children and adolescents with major depressive disorder (MDD) but refer them to psychiatrists.
- Child and adolescent psychiatrists have the expertise to treat these patients; however, there is a serious shortage of these health care providers in the United States.
- Pediatricians may be able to play a valuable role in the treatment of children and adolescents with MDD if their hesitation about treating this patient population is better understood and addressed.

METHOD

The study population consisted of all pediatricians (N = 59,237) in the American Medical Association's member list from SK&A Information Services (Ridgefield, Connecticut). From this population, a national random sample of 2,000 pediatricians was selected for the study. Pediatricians were surveyed from the beginning of November 2007 through the end of January 2008.

The survey instrument (available from A.R.P. upon request) was designed to determine the following regarding newly diagnosed children and adolescents with *DSM-IV-TR* MDD: (1) whether or not the pediatrician treats children, adolescents, or both; (2) whether or not the pediatrician refers children, adolescents, or both; and (3) when the pediatrician does refer a patient, to which health care provider is a referral made. Additionally, the information gathered from this survey combined with demographic information accessed from the physician database allowed the researchers to detect any geographic differences in pediatricians' willingness to treat children or adolescents with MDD.

During the development of the survey, content and face validity were assessed. An expert panel (from the fields of psychiatry and health outcomes) assessed the overall survey readability, clarity of the questions, and relevance of the questions. All recommendations for changes to content and wording of questions were accepted.

The study protocol and final survey were approved by the West Virginia University Institutional Review Board. Descriptive statistics and χ^2 tests were utilized to analyze the data. All statistical analyses were conducted using SAS software, version 9.1 (SAS Institute Inc, Cary, North Carolina).

RESULTS

The sample consisted of 2,000 pediatricians. The study used a modified Dillman approach[14] in which each physician was mailed a cover letter, a 1-page survey, and a return postage–paid envelope. Nonrespondents were mailed a second copy of the cover letter, survey, and return postage–paid envelope approximately 5 weeks later. According to Salant and Dillman,[15] mailings of questionnaires should occur more closely together than the 5 weeks allowed in this study. In this case, however, the second mailing would have coincided with the Christmas holiday season. The decision was made to delay the second mailing until after the holiday season to maximize the response rate.

The response rate for returned surveys received within 2 months of the initial mailing was 23.6% (424 of 1,800 deliverable surveys). Of the 424 returned surveys, 11 were unusable as these pediatricians indicated they were either retired or no longer in practice. Another 5 surveys were unusable because the physicians failed to complete the survey. The usable response rate was 22.7% (408 of 1,800), as shown in Table 1. This response rate is congruent with rates seen in other studies that have surveyed physicians.[16,17]

Demographic information was obtained for a subpopulation of pediatricians (n = 57) who indicated that they treat "adolescents only" or treat both "children and adolescents" for MDD. The survey respondents can be characterized as comprising slightly more men than women. The majority of respondents are between 41 and 60 years of age, with a medical practice based in a private group practice. A greater proportion of respondents lives in the Midwest, followed by the West and South, and few live in areas with large population concentrations. On average, respondents reported that they treat 10 or fewer children and adolescents diagnosed with MDD per week and have more than 10 years' experience in treating children and adolescents. The specific characteristics of respondents are listed in Table 2.

The first objective was to determine the proportion of pediatricians who treat children and adolescents with MDD. The findings indicated that the majority of these pediatricians (60.0%, 245 of 408) do not treat either children or adolescents with MDD, whereas 28.2% of the pediatricians (n = 115) indicated they treat both children and adolescents with MDD. No pediatricians treat children only, in comparison to 48 pediatricians (11.8%) who indicated they treat adolescents only.

Second, the researchers sought to determine the proportion of pediatricians who refer children and adolescents with MDD. Results indicated that the majority of the pediatricians (83.6%, 341 of 408) refer both children and adolescents for the treatment of MDD, in contrast to a minority of pediatricians (7.8%, 32 of 408) who do not refer either patient population to another health care provider for treatment of this disorder. Approximately the same percentage of pediatricians indicated that they refer only children (4.2%, 17 of 408) or only adolescents (4.4%, 18 of 408) to another type of health care provider for treatment of MDD. These results are depicted in Figure 1.

The study also determined the health care provider to whom pediatricians refer a child or adolescent with MDD. The pediatricians were asked to indicate in an open-ended question format the type of health care provider to whom they would refer children. The same question was asked for adolescent patients. The frequencies for the type of health care provider to whom pediatricians refer children and/or adolescents were calculated. The results are listed in Table 3.

Table 1. Response Rate for Pediatrician Survey

Variable	N	%
Original sample size (surveys mailed)	2,000	
Undeliverable surveys	200	
Effective sample size	1,800	100.0
Surveys returned by pediatricians	424	23.6
Unusable surveys	16	
Usable surveys	408	
Usable response rate		22.7

Pediatricians listed up to 3 different health care providers to whom they would refer children for treatment, resulting in 358 total responses. Pediatricians indicated that they most often refer children to some type of psychiatrist (38.3%, 137 of 358 responses), and 29.3% of the responses (n = 105) specifically indicated a child and adolescent psychiatrist. The results for other health care providers are listed in Table 3.

The responses for adolescents mirrored those for children. Pediatricians listed up to 3 different health care providers to whom they would refer adolescents for treatment, resulting in 364 total responses. Pediatricians indicated that they most often refer adolescents to some type of psychiatrist, with 25.0% of the responses (91 of 364) indicating a child and adolescent psychiatrist and 42.3% (n = 154) indicating a psychiatrist. Other health care providers were indicated less often and can be seen in Table 3.

Additionally, the researchers sought to test the null hypotheses that there is no difference between geographic regions for pediatricians who treat (1) children and (2) adolescents with MDD versus referring them for treatment. The results indicated that treating and referring patients is not a mutually exclusive choice for pediatricians. Some physicians indicated that they treat and also refer. Some pediatricians even indicated they would try 1 line of treatment, and, if that treatment did not produce a response, they would refer. Since treating and referring are not mutually exclusive, analysis was conducted by geographic region for both children and adolescents according to whether or not pediatricians treat these individuals.

None of the pediatricians indicated that they "treat children only." Pediatricians were classified as treating children if they indicated they "treat both children and adolescents." Similarly, pediatricians were classified as treating adolescents if they indicated they "treat adolescents only" or "treat both children and adolescents."

In our study, geographic regions were specified according to US Census Bureau definitions. The US Census Bureau divides the United States into 5 geographic regions as follows: Northeast, South, Midwest, West, and Pacific.

There were no pediatricians from the Pacific geographic region who responded to the survey. The χ^2 statistic was utilized to determine if there were differences in whether or not pediatricians treat children across the remaining 4 geographic regions (Northeast, South, Midwest, and West). The results of this analysis are shown in Table 4 ($\chi^2_3 = 6.532$, $P = .088$) and indicate that the proportion of pediatricians who treat children did not vary significantly according to geographic region.

Table 2. Characteristics of a Subpopulation of Treating Pediatricians (n = 57)[a]

Characteristic	n (%)
Gender	
Men	32 (56.1)
Women	24 (42.1)
Data missing	1 (1.8)
Age, y	
≤ 40	10 (17.5)
41–50	12 (21.1)
51–60	26 (45.6)
≥ 61	8 (14.0)
Data missing	1 (1.8)
Primary practice site	
Private-based practice, solo office	5 (8.8)
Private-based practice, group office	38 (66.6)
Hospital-based practice, university	3 (5.3)
Hospital-based practice, nonuniversity	4 (7.0)
Other (except hospital and private)	6 (10.5)
Data missing	1 (1.8)
Geographic location of practice	
South	14 (24.6)
Northeast	9 (15.7)
Midwest	19 (33.3)
West	14 (24.6)
Pacific	0 (0.0)
Data missing	1 (1.8)
Population of practice area (no. of people)	
< 50,000	14 (24.6)
50,000–249,999	14 (24.6)
250,000–499,999	12 (21.1)
500,000–999,999	8 (14.0)
≥ 1,000,000	6 (10.5)
Data missing	3 (5.2)
Child patient volume per week with MDD	
≤ 10	31 (54.4)
11–50	4 (7.0)
51–100	2 (3.5)
≥ 101	19 (33.3)
Data missing	1 (1.8)
Adolescent patient volume per week with MDD	
≤ 10	32 (56.1)
11–50	10 (17.5)
51–100	2 (3.5)
≥ 101	12 (21.1)
Data missing	1 (1.8)
No. of years treating children and/or adolescents	
> 1 year to 5 years	3 (5.3)
> 5 years to 10 years	9 (15.8)
> 10 years	43 (75.4)
Data missing	2 (3.5)

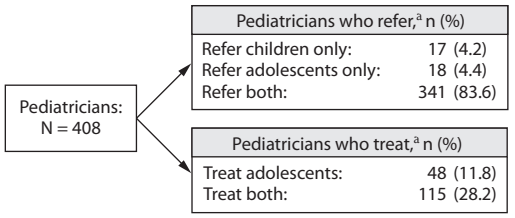
[a]Demographic information was collected on a portion (n = 57) of the pediatricians who indicated that they treat either "adolescents only" or "children and adolescents" for MDD.
Abbreviation: MDD = major depressive disorder.

Next, the researchers determined if there were differences in whether or not pediatricians treat adolescents across the 4 geographic regions. The results ($\chi^2_3 = 4.019$, $P = .259$) indicated that the proportion of pediatricians who treat adolescents did not significantly vary by geographic region.

DISCUSSION

Major depressive disorder is associated with serious risks for children and adolescents and therefore needs to be treated. In light of the current shortage of child and adolescent psychiatrists, this study sought to clarify the role

Figure 1. Percentages of Pediatricians Who Treat or Refer Children and Adolescents With Major Depressive Disorder



[a]Referring and treating are not mutually exclusive.

Table 4. Number of Pediatricians Who Do or Do Not Treat and Proportion of Those Who Treat Children With MDD by Geographic Region (N = 408)[a]

Treat Children With MDD	Northeast, n	South, n	Midwest, n	West, n	Total, N
Yes	21	35	37	22	115
No	86	85	68	54	293
Total	107	120	105	76	408
Proportion who treat children[b]	0.1963	0.2917	0.3524	0.2895	

[a]No responses from the Pacific region.
[b]$\chi^2_3 = 6.532$, $P = .088$.
Abbreviation: MDD = major depressive disorder.

Table 3. Health Care Providers to Whom Pediatricians Refer Children and Adolescents With MDD

	Refer Children With MDD		Refer Adolescents With MDD	
Health Care Provider to Whom Referred	Total Frequency, no.	%	Total Frequency, no.	%
Psychiatrist	137	38.3	154	42.3
Child and adolescent psychiatrist	105	29.3	91	25.0
Psychologist	49	13.7	51	14.0
Counselor, therapist, or MSW	21	5.9	25	6.9
Crisis center, mental health clinic, or hospital	20	5.5	23	6.3
Other medical doctor	10	2.8	6	1.6
Unspecified mental health care provider	6	1.7	5	1.4
Any available mental health care provider	5	1.4	5	1.4
Child psychologist	5	1.4	4	1.1
Totals	358	100.0	364	100.0

Abbreviations: MDD = major depressive disorder, MSW = Master of Social Work.

of pediatricians in treating children and adolescents with MDD.

A national random survey of pediatricians was conducted in 2001 before the introduction of the FDA black-box warning for antidepressant use in children and adolescents. This 2001 Olson et al study[17] indicated that many pediatricians felt responsible for recognizing depression in children and adolescents but were not likely to feel responsible for treating these children (27%) and adolescents (26%).[17] The current study indicated that, after the 2004 black-box warning, a majority (60%) of the pediatricians surveyed (245 of 408) did not treat MDD in children or adolescents. Additionally, 28.2% of the pediatricians (n = 115) reported treating both children and adolescents for MDD. None of the pediatricians who were surveyed treat children only, while 11.8% (n = 48) treat adolescents only.

Additionally, the Olson et al[17] research indicated that pediatricians referred children (78%) and adolescents (79%) to other mental health care professionals for treatment. The findings of the current study reveal that over 80 percent of the pediatricians (83.6%, 341 of 408) reported that they refer children and adolescents to some other type of health care provider. It was found that the pediatricians' decision to refer or treat was not necessarily a mutually exclusive decision. Psychiatrists were the primary health care providers to whom pediatricians most often refer children (67.6%, 242 of 358) and adolescents (67.3%, 245 of 364). The second most common referral to a health care professional was to a psychologist for both children (13.7%, 49 of 358) and adolescents (14.0%, 51 of 364).

Although this study did not explore the rationale for referring patients, the reason for pediatricians' hesitation to treat and thus refer, according to a previously published study,[17] may be due to their lack of confidence in their ability and training regarding the diagnosis and management of this disorder. Pediatricians' rationale, after the 2004 FDA black-box warning, for referring patients was not explored in this study. This rationale can be explored in future research.

The previously conducted study[17] did not focus specifically on MDD in children and adolescents as did the current study. The results, however, of both studies represent a consistent trend toward hesitation of pediatricians to treat any form of depression in children and adolescents, including MDD.[17]

The limitations of the current study are related to the survey methodology employed. Surveys can be prone to sampling error, nonresponse bias, measurement error, and self-report bias. Steps were taken in this study to mitigate the impact of these factors. This study used a national random sample of pediatricians to increase the generalizability of the results of the survey. Also, a second mailing of the survey was sent to the pediatricians who did not respond to the first survey mailing. Incentives have been shown to increase response rates[18]; however, due to limited resources, offering an incentive was not feasible for this study.

Approximately half of the respondents in this study from whom demographic information was collected indicated that their practice sites were located in areas where the population is less than 250,000 (see Table 2). Specialists, including child and adolescents psychiatrists, tend to be concentrated in larger metropolitan areas.[19] Since the majority of respondents were located in less populated geographic areas, the rate of referral may actually be underestimated in this study. If pediatricians practice in larger metropolitan areas with more access to child and adolescent psychiatrists, then their referral rates may be even higher than this study indicates.

Content and face validity were assessed. Experts assessed the readability of the survey and the clarity and the relevance

of the questions. Only minor wording changes were made to increase the clarity of the survey instrument prior to the first mailing. Even though content and face validity were assessed, measurement error may have occurred if the respondents did not understand the survey questions or instructions. If this were the case, this fact would have impacted the accuracy of the inferences drawn from the survey responses.

Left untreated, MDD can have a serious impact on the lives of children and adolescents. MDD is associated with a high risk of substance abuse, impaired functioning, and even suicide.

The current study highlights that treatment of children and adolescents with MDD in the United States has reached a crisis. The majority of pediatricians would rather refer these patients to specialists. There is, however, a serious shortage of experts, child psychiatrists, who are trained to care for these patients.[11]

Children and adolescents with any mental disorder, including MDD, may have to wait months to be seen by a mental health care provider or travel long distances to receive the care they need.[19]

Author affiliations: Division of Clinical, Social, and Administrative Sciences, Mylan School of Pharmacy, Duquesne University, Pittsburgh, Pennsylvania (Dr Pfalzgraf); Department of Pharmaceutical Systems and Policy, West Virginia University School of Pharmacy, Morgantown (Dr Scott); Department of Mental Health, Charles George Veterans Affairs Medical Center, Asheville, North Carolina (Dr Makela); Department of Social Work, Frostburg State University, Frostburg, Maryland (Dr Hartsock); Pharmacy Care Systems, Harrison School of Pharmacy, Auburn University, Auburn, Alabama (Dr Kavookjian); and Global Health Outcomes, Eli Lilly and Company, Indianapolis, Indiana (Dr Miller).

Author contributions: Drs Pfalzgraf, Scott, Makela, Hartsock, Kavookjian, and Miller were responsible for the study design and methodology. The survey used in this study was developed by Drs Pfalzgraf, Scott, and Makela. The manuscript was written and edited by Drs Pfalzgraf and Scott.

Potential conflicts of interest: **Dr Scott** has been a member of the Board of Directors of the American Association of Colleges of Pharmacy. **Dr Miller** is an employee of Eli Lilly. **Drs Pfalzgraf**, **Makela**, **Hartsock**, and **Kavookjian** report no conflicts of interest relative to the subject of this article.

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