

Primary Care Provider Training in Screening, Assessment, and Treatment of Adolescent Depression

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Received for publication July 9, 2014; accepted December 9, 2014.

ABSTRACT

OBJECTIVE: Adolescent depression is underrecognized and undertreated. Primary care providers (PCP) require training to successfully identify adolescents with depression. We examined the effects of a PCP training program in the screening, assessment, and treatment of adolescent depression (SAT-D) on adolescents' reports of PCP screening for adolescent depression at annual well visits and PCP SAT-D confidence and knowledge.

METHODS: PCP (n = 31) attended one SAT-D training program consisting of a 60-minute SAT-D seminar and a 60-minute standardized patient session where PCP practiced SAT-D skills. A pre-post design evaluated effects of training on PCP depression screening practices as reported by 3 groups of adolescent patients at well visits (n = 582 before, n = 525 at 2 to 8 months after training, n = 208 at 18 to 24 months after training). A generalized linear mixed effects logistic regression controlled for provider and patient demographics that may have influenced depression screening. PCP SAT-D self-reported confidence and objectively tested knowledge were assessed at baseline, immediately after training, and at 4 to 6 months after training.

RESULTS: On the basis of the regression analysis, PCP screening for adolescent depression increased significantly from pretraining (49%) to 2 to 8 months after training (68%, odds ratio 2.78, 95% confidence interval 2.10–3.68) and 18 to 24 months after training (74%, odds ratio 3.17, 95% confidence interval 2.16–4.67; both $P < .0001$). PCP SAT-D confidence and knowledge also significantly improved.

CONCLUSIONS: PCP SAT-D training resulted in significant increases in primary care screening for adolescent depression that were maintained up to 24 months after training. Future studies should determine if changes in PCP screening improve identification of adolescent depression and patient outcomes for adolescents with depression.

KEYWORDS: adolescent depression; primary care; screening; standardized patient

ACADEMIC PEDIATRICS 2015;15:326–332

WHAT'S NEW

Adolescent patient reports of primary care provider (n = 31) practices before (n = 582) and then 2 to 8 months (n = 525) and 18 to 24 months (n = 208) after training showed significant improvements in depression screening. Future studies should determine if training improves depression identification and treatment outcomes.

ADOLESCENT DEPRESSION, A critical public health problem, is underrecognized and undertreated. Only 50% of cases are identified,¹ and of the 2 million US adolescents diagnosed annually with depression,² only a minority (38%) receive treatment.² Untreated adolescent depression leads to many adverse outcomes,^{3,4} including suicide,⁵ the third leading cause of death among US youth.⁶ Early identification of depression represents an important opportunity to prevent the morbidity and

mortality associated with depression and suicide.⁷ Primary care providers (PCP) are uniquely positioned to identify early signs of depression. PCP evaluate 70% of adolescents annually,⁸ including 45% of suicide victims within the month before completed suicide.⁹ The American Academy of Pediatrics (AAP)¹⁰ and the United States Preventive Task Force¹¹ both recommend primary care screening for adolescent depression, and the AAP has developed expert guidelines for the assessment and management of depression.^{12,13} Despite these guidelines, PCP are screening few adolescents at annual well visits for depression.^{14,15}

Although guidelines represent an important first step toward changing PCP practice patterns, additional interventions are needed to promote improvements in primary care assessment and management of depression.^{16,17} PCP report that they lack sufficient training in depression assessment and management,^{18–20} and they thus need additional practice to gain competence. Traditional

continuing medical education using didactic lectures alone has minimal impact on clinical practice,¹⁷ so a more comprehensive, multifaceted educational intervention is needed to facilitate screening. One British group developed such a training program for general practitioners that incorporated a practical tool kit to facilitate office-based screening for adolescent depression.²¹ Although limited by a low general practitioner participation rate (5.7%), the program showed modest posttraining improvements in general practitioner screening for and identification of adolescent depression.²¹ However, that program did not include explicit training on conducting suicide risk assessment, which is a key component of depression assessment. The training also did not include structured opportunities to practice critical skills in communicating with adolescents about depression and suicide. There has only been one report of a training program that allowed PCP to practice clinical skills in both adolescent depression and suicide risk assessment using standardized patients (SP).¹⁵ Compared with untrained PCP, trained PCP were significantly more likely to report use of a standardized depression screening tool (50% vs 19%, $P = .001$) and diagnosis of adolescent depression (96% vs 78%, $P = .013$) in the past 3 months.¹⁵ One limitation of the study was that PCP practices were measured by asking pediatricians to recall whether or not that they had screened for or diagnosed adolescent depression in the past 3 months. Because depression screening was reported retrospectively and by physicians, who tend to both overestimate and underestimate preventive service delivery,²² the validity and reliability of these reports of depression screening is questionable. A better way to measure PCP screening practices may have been to survey adolescent patients immediately after each well visit; adolescent patients have been shown to reliably recall discussions with their provider about preventive care even 2 weeks after a visit.^{22,23} Another limitation of the previous study was that training focused on assessment but not on management of depression with antidepressant medication. Given the shortage of mental health providers, it is critical that PCP gain skills and knowledge in both assessment and management of depression.

The present study evaluated a brief program of PCP training in the screening, assessment, and treatment of adolescent depression (SAT-D), including the use of antidepressant medication. The primary outcome was the frequency of PCP screening for adolescent depression at well visits as reported by adolescent patients. Secondary outcomes were PCP SAT-D self-reported confidence and objectively tested knowledge. Exploratory outcomes included the frequency of PCP: 1) identification of adolescent depression, 2) discussion of evidence-based treatment for depression, and 3) administration of a standardized depression screening tool (long-term follow-up only). We hypothesized that this enhanced training program would increase the frequency of PCP depression screening as reported by adolescent patients at well visits and also improve PCP SAT-D confidence and knowledge.

METHODS

STUDY DESIGN

A pre-post design assessed changes in adolescent patient reports of PCP screening for depression (primary outcome) at baseline versus 2 to 8 months and versus 18 to 24 months after training. Because both follow-up periods occurred during the school year, when fewer adolescent well visits occur, 6 months were required to collect a comparable number of adolescent well visit surveys. Secondary outcomes included PCP SAT-D self-reported confidence and objectively tested knowledge. Follow-up measurement of PCP SAT-D confidence and knowledge occurred immediately after training and again at 4 to 6 months after training. Exploratory outcomes included the frequency of PCP: 1) identification of adolescent depression, 2) discussion of evidence-based treatment for depression, and 3) administration of a standardized depression screening tool (at 18 to 24 months after training only) (Figure). As a preliminary study, this pre-post design offered the advantage of a prospective direct benefit to all participating PCP. In addition, it allowed our team to determine the effects of the SAT-D intervention in order to justify a more rigorous future randomized controlled trial. The study took place at 4 outpatient primary care clinics in Jacksonville, Florida, from August 2012 to August 2014.

Both the Nemours Foundation and the University of Florida institutional review boards approved the protocol. PCP provided written informed consent to participate. PCP were not aware of which patients were participating in the study. Adolescents and their parents were informed before data collection about the purpose and procedures of the research study and that participation was voluntary. Adolescents had no knowledge about whether or not their PCP had completed training. Adolescent patients reported anonymously on whether their PCP asked them about depression but reported no clinical information about symptoms of depression. Because adolescents were reporting anonymously on physician screening practices but not on any individual health information, the institutional review board waived the requirement for documentation of parental permission and adolescent assent.

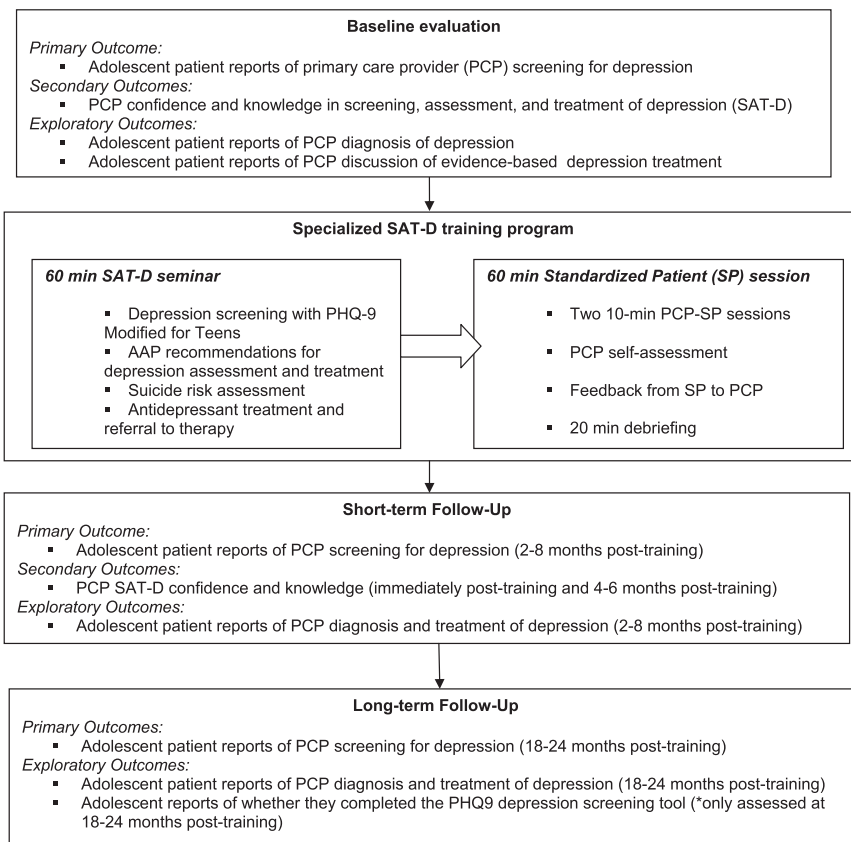
PARTICIPANTS/RECRUITMENT

PRIMARY CARE PROVIDERS

The primary investigator invited 4 group practices of PCP in Jacksonville, Florida, that each provided care to 200 or more adolescents annually and represented a diverse mix of patients with private and Medicaid insurance. PCP were not compensated for their time but were offered 2 hours of continuing medical education credit as a participation incentive.

ADOLESCENT PATIENTS AT WELL VISITS

All adolescent patients (aged 12 to 18 years) of participating PCP and the adolescents' caregivers who arrived for well visits during the study period were given a letter at



AAP – American Academy of Pediatrics
 PHQ9 – Patient Health Questionnaire 9 Item Modified for Teens

Figure. Study diagram.

check-in inviting them to participate in a research study designed to improve PCP practices in depression screening, assessment, and treatment. This letter invited adolescents to complete a survey regarding their PCP's SAT-D practices. Immediately after their well visit, and after the PCP had left the examination room, office staff asked adolescents to complete this anonymous, confidential survey and return it to a lock box near the checkout area. Adolescents were not compensated for their participation.

Because adolescents present for only 1 annual visit every 12 months, no adolescent was included in both the baseline (ie, 1 to 2 months before training) and 2 to 8 months post-training samples. It is possible that some adolescent patients in the 18- to 24-month follow-up had contributed data at one of the earlier measurement points. Because all surveys were anonymous, it was not possible to determine the extent of the overlap between the adolescent reporters.

SAT-D TRAINING INTERVENTION

The 2-hour SAT-D training was based upon a previously studied intervention¹⁵ enhanced by additional content regarding the logistics of implementing universal office-based depression screening at annual well visits, addressing confidentiality with families, billing and coding for services, and initiation and maintenance of antidepressant treatment. Each practice chose a convenient time and place

for training in fall 2012. Training consisted of a 60-minute SAT-D seminar conducted by the primary investigator (a board-certified child and adolescent psychiatrist) followed by a 60-minute SP session. The case-based seminar reviewed an evidence-based approach to: 1) depression screening using a standardized tool, the Patient Health Questionnaire—9 Item Modified for Teens (PHQ9M),²⁴ 2) depression diagnosis, treatment, and monitoring based on AAP recommendations,^{12,13} 3) suicide risk assessment,²⁵ and 4) antidepressant dosing strategies and the protocol for long-term management including monitoring for side effects in light of the US Food and Drug Administration black box warning.²⁶ The PHQ9M is a 13-item self-report questionnaire²⁴ based on the Patient Health Questionnaire—9 Item, which is well validated to assess adolescent depression and suicidality in primary care.²⁷ Practices were encouraged to implement universal screening at adolescent well visits using the PHQ9M. PCP received a sample office protocol detailing how to distribute, score, and review the PHQ9M routinely at adolescent well visits. After the training, senior PCP separately met with their office staff to tailor the office protocol for depression screening to fit into their respective practices. None of the practices was using an electronic medical record at the time of training, so the office protocol involved the use of a paper version of the PHQ9M. PCP were taught how to appropriately document, code, and

bill for clinical services. PCP received an educational packet including copies of the screening tool, treatment algorithms, and antidepressant medication dosing guidelines. During the SP session, all PCP practiced integrating SAT-D into a typical well visit during 2 separate 10-minute mock interviews, with SP portraying a 16-year-old with low mood and poor grades and a 17-year-old with irritability and drug use. SP were adolescent-appearing young adults recruited from local theater companies who had been previously trained by a team of child and adolescent psychiatrists and pediatric psychologists in two 3-hour sessions to portray adolescents with depression and suicide risk. During this SP rehearsal, SP were also given instruction on providing feedback from the perspective of the adolescent patient to PCP. After each PCP-SP mock interview, SP gave verbal feedback to PCP for 5 to 10 minutes regarding communication skills. The PCP then met with the primary investigator for a 20-minute debriefing session to discuss ways to implement universal screening in their practices.

MEASURES

ADOLESCENT REPORT OF PCP PRACTICES

The Adolescent Report of PCP Practices (AROP) is an anonymous 19-item patient-report measure that includes questions about whether their PCP screened them for depression, diagnosed them with depression, and discussed evidence-based depression treatment options (ie, antidepressant medication, referral to therapy, psychiatry) with them. The question used to assess PCP screening practices for depression is, "During today's clinic visit with your doctor, did s/he ask you if you have been feeling down?" (yes/no). The AROP used for the long-term posttraining follow-up also included an additional question assessing whether adolescents patients were given the PHQ9M in order to ascertain whether screening using a standardized tool occurred. The AROP has not been validated formally but shows both face and construct validity. It is based on a similar instrument, the Adolescent Report of the Visit, which has shown construct validity in studies of adolescents patients reporting on PCP delivery of preventive services.^{23,28}

PCP CONFIDENCE AND KNOWLEDGE SURVEY

This secondary outcome measure is a 17-item scale with acceptable face, content, discriminant, and construct validity that has been previously used to determine pediatrician self-rated confidence and objectively tested knowledge about depression and suicide risk assessment.^{15,25} PCP were asked to rate their confidence in aspects of depression care for adolescents (ages 12 to 18 years) using a 5-point Likert scale where 1 = very low and 5 = very high. A sample item is, "Please rate your confidence in...initiating depression treatment with a selective serotonin reuptake inhibitor." Knowledge was determined on the basis of mean PCP scores on an 8-question, multiple-choice quiz using clinical vignettes previously piloted with a focus group of PCP to determine face validity.¹⁵

Notably, knowledge questions were slightly different in the pre- and postintervention quizzes in order to avoid artificial test-retest score increases.

DATA ANALYSES

The presence or absence of screening for adolescent depression at well visits as reported by adolescent patients (AROP) was the primary outcome. Generalized linear mixed effects logistic regression was used to model this binary outcome (SAS PROC GLIMMIX). Predictors include time (before training, 2 to 8 months after training, and 18 to 24 months after training), patient gender, and age as fixed effects (based on significant associations with PCP screening found in preliminary analyses) and group practice and PCP nested within group practice as random effects. We also fit models with provider gender and interactions of all predictors and determined these were not significant using Akaike Information Criterion—Corrected.²⁹ The model accounts for clustering of adolescent reports within each PCP and PCP within group practices.³⁰ All analyses were performed in SAS for Windows, version 9.3 or later (SAS Institute, Cary, NC).

Mean PCP confidence in depression assessment (5 items) and treatment (4 items) were calculated on the basis of mean total scores. Mean PCP knowledge was quantified as the percentage of the 8 questions correctly answered. Wilcoxon signed rank sum tests and paired *t* tests were used to calculate differences in mean PCP confidence and knowledge, respectively.

RESULTS

PRIMARY CARE PROVIDERS

All 4 pediatric primary care practices (3 private, 1 public health department) agreed to participate. Out of 32 eligible PCP, 31 PCP participated in baseline and short-term follow-up data collection (97%; mean of 7 per clinic, range 3–15): 25 pediatricians and 6 pediatric nurse practitioners. The majority of PCP were women (68%). PCP had been in practice for an average of 16 years (range 1–37 years), but had reported only a mean of 2.9 weeks of prior mental health training including during residency. At 18- to 24-month follow-up, 21 PCP (68%) participated in data collection. Attrition was thought to be due to data collection burden. PCP who dropped out of the study did not differ significantly from those who completed the study in terms of depression screening, adolescent patient gender, or age.

ADOLESCENT PATIENTS

Three samples of adolescents ($n = 582$ at baseline, $n = 525$ at 2 to 8 months after training, and $n = 208$ at 18 to 24 months after training) completed surveys regarding their PCP's SAT-D practices. The 3 samples did not differ in mean age (14.3, 14.3, and 14.5 years, respectively), race (76%–86% white), or gender (49%–57% female) (Table 1). The mean number of adolescent surveys per PCP was 19, 17, and 10 respectively. There were fewer

Table 1. Adolescent Patient Demographics

Characteristic	Baseline	2–8 Months	18–24 Months
	(n = 582)	After Training (n = 525)	After Training (n = 208)
Sex			
Male	235 (43)	267 (51)	96 (46)
Female	307 (57)	255 (49)	111 (53)
Age, y	14.3 ± 1.8	14.3 ± 1.8	14.5 ± 1.8
Age group			
12–14 y	330 (57)	307 (59)	106 (51)
15–18 y	248 (43)	217 (41)	102 (49)
Race/ethnicity			
African American	90 (16)	51 (10)	17 (8)
Asian/Pacific Islander	23 (4)	18 (4)	5 (2)
Hispanic/Latino	48 (9)	35 (7)	24 (12)
White	428 (76)	431 (86)	172 (84)

Data are presented as n (%) or mean ± SD.

adolescent patient surveys at long-term follow-up, in part related to PCP attrition from the study.

PRIMARY OUTCOME: PCP FREQUENCY OF SCREENING FOR ADOLESCENT DEPRESSION AT WELL VISITS AS MEASURED BY ADOLESCENT PATIENT REPORTS

Adolescent female subjects were more likely than male subjects to be screened for depressed mood (odds ratio 1.65, 95% confidence interval [CI] 1.25–2.16, $P < .0003$). Older adolescents were more likely to be screened than younger adolescents for depression. For example, if the patient was 18 years old, the odds ratio of being screened compared to a 12-year-old was 2.0 (95% CI 1.3–3.8). PCP screening did not differ by adolescent race or ethnicity, or provider gender or degree. After controlling for adolescent gender and age, there was a significant increase in PCP depression screening at both short-term and long-term follow-up (49% pre vs 68% short-term odds ratio 2.78, 95% CI 2.10–3.68, and 74% at 18 to 24 months after training, odds ratio 3.18, 95% CI 2.16–4.67; both $P < .0001$) (Table 2). To assess whether or not PCP who discontinued before the long-term follow-up period differed from study completers in terms of screening rates, this characteristic was added to the GLIMMIXLR model. This term was not statistically significant ($P = .63$).

SECONDARY OUTCOMES: PCP CONFIDENCE AND KNOWLEDGE

On a scale of 1 to 5, PCP reported low mean confidence at baseline in depression assessment (mean [SD]; 2.7 [0.6]) and depression treatment (2.4 [0.9]). Immediately after training, PCP reported moderate to high mean confidence in depression assessment (3.9 [0.6]) and treatment (3.6 [0.7], both $P < .0001$), representing significant improvements. These significant improvements were maintained at 4 to 6 months after training (depression assessment 3.7 [0.5]; depression treatment 3.4 [0.6], both $P < .0001$).

There were significant improvements in SAT-D knowledge as measured by mean total quiz scores seen immediately after training (baseline 78% vs immediately after

Table 2. PCP Screening for Adolescent Depression at Well Visits as Reported by Adolescents†

Characteristic	Baseline	2–8 Months After Training	18–24 Months After Training
Frequency of PCP screening	49%	68%*	74%*
Odds ratio (95% confidence interval) vs baseline	—	2.78 (2.10–3.68)	3.18 (2.16–4.67)

PCP indicates primary care provider.

* $P < .0001$.

†Frequency of screening was calculated as the number of adolescents screened divided by the total number of adolescent visits and expressed as a percentage. Generalized linear mixed effects logistic regression controlling for adolescent gender and age was used to model change in PCP screening for adolescent depression at well visits as measured by adolescent patient reports.

training 96%; $P < .0001$). These improvements were maintained at 4 to 6 months after training (90%; $P = .0012$).

EXPLORATORY OUTCOMES

Adolescents reported an increase in diagnosis of depression at long-term but not short-term follow-up (3.3% pre vs 5% short-term, $P = .19$; 10% long-term, $P < .0001$). Discussion of at least one type of evidence-based treatment among depressed adolescents increased at both follow-up points compared with baseline (54% baseline vs 93% short-term follow-up, $P = .001$; 86% long-term follow-up, $P = .01$).

At 18 to 24 months after the intervention, 95% of adolescent patients reported that they were asked to complete the PHQ9M.

DISCUSSION

Our results showed that training significantly improved the frequency of PCP screening for adolescent depression at well visits and was associated with improvements in SAT-D confidence and knowledge. Improvements in depression screening persisted across a follow-up interval ranging from 2 to 24 months after training, suggesting that these skills were incorporated into routine practice. However, posttraining PCP screening for depression remained less than universal (range 67%–74%).

Notably, 95% of the adolescents surveyed at 18 to 24 months after training reported that they completed the PHQ9M, but only 74% of all adolescents reported that their PCP asked them “if they have been feeling down.” It is likely that the wording of the question stem on the AROP (ie, “Did your doctor ask you ...”) may have underestimated true screening rates by capturing only screening that occurred through direct PCP questioning rather than using a standardized depression screening tool. When an adolescent’s PHQ9M results indicated low risk for depression, the PCP would be unlikely to ask the adolescent redundant questions about depression. Notably, all PCP indicated that they had not been using a validated depression screening instrument before training. Instead, the PCP reported that depression screening had been

performed inconsistently and by using nonspecific questions such as, “How have things been going at home and at school?” This type of questioning is not validated to detect cases of depression. After training, all PCP reported that they had incorporated universal screening for depression at all adolescent well visits using the PHQ9M. Quarterly visits to the PCP practices confirmed that office staff members were routinely administering the PHQ9M at adolescent well visits. Reports from adolescents, PCP, and staff members of universal use of the PHQ9M suggest that the main question from the AROP used to assess depression screening underestimated the true prevalence of screening, thus conservatively biasing the study findings. Further refinement of the AROP will be needed to more accurately assess PCP screening practices, although the AROP’s sensitivity to the SAT-D intervention affirms its discriminant validity.

Although there was preliminary evidence of increased PCP diagnosis and discussion of treatment of depression at 18 to 24 months, these findings should be confirmed using larger samples in future studies.

Our findings support the evidence from other studies that multifaceted training interventions improve PCP screening for adolescent depression.^{21,31} Our study’s high PCP participation rate (97%) suggests that this brief training was acceptable and feasible for PCP. To our knowledge, our study is the first to demonstrate improvements in screening for adolescent depression even after controlling for relevant adolescent and provider characteristics. Another strength of this study is that verification of PCP screening practices was achieved by asking 3 large samples of adolescents to report on whether or not the PCP demonstrated these behaviors immediately after a well visit over a 2-year period. The large sample of adolescents, and the fact that they were unaware of whether the PCP had completed SAT-D training, lend credibility to the study findings.

A limitation of the study was the use of a single source of data regarding PCP SAT-D practices. The inclusion of data from medical and billing records regarding whether standardized depression screening was documented and billed for at well visits before versus after training could permit a direct comparison of adolescent report with physician documentation of practices, and would have strengthened the study. No practice was using an electronic medical record during the first 6 months of the study, so manual collection of chart data was cost prohibitive. Obtaining billing data will be explored for future studies. Another limitation is that the accuracy of PCP diagnoses of depression is not known. In order to improve PCP diagnostic accuracy, PCP were trained to use a well-validated screening tool in addition to an evidence-based clinical algorithm. Finally, a randomized controlled trial would have been a more rigorous design.

CONCLUSIONS

Given multiple barriers to accessing specialty mental health care^{32,33} and the shortage of mental health

clinicians,³⁴ skills in depression assessment and management will be increasingly critical for PCP. The training intervention was widely accepted by PCP and resulted in improved PCP confidence and screening for depression, and discussion of depression treatment. Such interventions are needed to help empower PCP to promote early identification and treatment of adolescent depression. The next steps will be to determine if changes in PCP screening improve identification of adolescent depression and patient outcomes using a rigorous randomized controlled trial.

ACKNOWLEDGMENTS

This study was funded by the Nemours Foundation and by Substance Abuse and Mental Health Services Agency (SAMHSA), grant 5U79SM059939-04, to the Partnership for Child Health and to the Jacksonville Children’s Commission (program director, Jeffrey Goldhagen, MD, MPH). We appreciate the Jacksonville pediatricians and practices who participated in the project: Baptist Pediatrics, Beaches Family Health Center, Carithers Pediatric Group, and Jacksonville Pediatrics. We are also grateful to the standardized patients for their participation.

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