



The Natural Course of Adolescent Depression Treatment in the Primary Care Setting

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ABSTRACT

Introduction: Little is known about how adolescents receive depression follow-up in primary care. The purpose of this study was to describe the rates of symptom assessment and depression treatment over time in a group of adolescents screening positive for moderate or severe depression in the primary care setting.

Methods: Retrospective chart reviews were conducted to gather information related to symptom reassessments, antidepressant prescriptions, psychotherapy referrals, and treatment discontinuation. Descriptive statistics were calculated, and a qualitative content analysis was conducted to determine the reasons for treatment discontinuation.

Results: Eighty records were reviewed (mean age = 15.3, 73% female, 59% Black). Treatment was initiated for 83% ($n = 66$) of patients, and 45% ($n = 30$) of patients discontinued treatment during the review period for a variety of reasons.

Discussion: To improve adolescents' adherence to depression treatment, providers should address factors that contribute to treatment discontinuation and use tools to manage depression follow-up care. *J Pediatr Health Care.* (2020) 34, 38–46

KEY WORDS

Adolescent, depression, primary health care, psychotherapy, antidepressants

INTRODUCTION

Adolescent depression is a prevalent and serious problem in the United States. In 2017, an estimated 13.3% of U.S. adolescents experienced a major depressive episode ([Substance Abuse and Mental Health Services Administration](#)

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[SAMHSA], 2018). Recent analysis of national data has also shown that rates of adolescent depression have risen significantly over the past 10 years (Mojtabai, Olfson, & Han, 2016; Twenge, Joiner, Rogers, & Martin, 2018). Depression is also associated with significant sources of morbidity and mortality in adolescents, such as anxiety, substance abuse, and suicidal behavior (Thapar, Collishaw, Pine, & Thapar, 2012).

For most adolescents, depression is treated by a provider in the primary care setting rather than by a mental health specialist (Anderson, Chen, Perrin, & Van Cleave, 2015; Olfson, Blanco, Wang, Laje, & Correll, 2014). Although pediatric primary care providers receive comprehensive training in a wide range of health conditions, formal training in the management of psychiatric disorders is necessarily limited in scope (Shahidullah et al., 2018), and pediatric primary care providers have expressed a lack of confidence in identifying and treating mental health disorders (Horwitz et al., 2015). The American Academy of Pediatrics (AAP) developed the Guidelines for Adolescent Depression in Primary Care (GLAD-PC) to assist primary care providers in the delivery of research-supported depression screening, assessment, and treatment services for youth (Cheung et al., 2007; Cheung, Zuckerbrot, Jensen, Laraque, & Stein, 2018). For adolescents with moderate or severe depression (the population on which this study focuses), the AAP recommends that the primary care provider initiate one or more evidence-based treatments for adolescent depression, such as psychotherapy or antidepressant medications (Lewandowski et al., 2013) at the time of the positive screening and diagnosis (Cheung et al., 2007; Cheung et al., 2018). The individual should be reassessed by the primary care provider within 6–8 weeks to determine if symptoms have improved or worsened (Cheung et al., 2007; Cheung et al., 2018).

Although guidelines exist for the management of depression in primary care, many adolescents experiencing depression do not obtain the appropriate mental health treatment in this setting (Merikangas et al., 2011; SAMHSA, 2018). Many adolescents who are diagnosed with depression in primary care do not receive any form of mental health treatment. In a large sample of U.S. youth, O'Connor and colleagues (2016) found that 21% of adolescents screening positive for moderate to severe depression in primary care did not receive any treatment for depression. Of those who did receive treatment in the primary care setting, many were prescribed antidepressants and referred to psychotherapy, consistent with best practice guidelines. O'Connor and colleagues (2016) observed that 29% of adolescents with depression were referred to psychotherapy alone, 19% were prescribed an antidepressant alone, and 16% received a combination of psychotherapy referral and antidepressant prescription.

Two studies have examined provider follow-up for depression among adolescents in primary care. Both studies found that most adolescents receiving antidepressant prescriptions did not receive the recommended clinical follow-up (Cloutier et al., 2013; O'Connor et al., 2016). Cloutier

and colleagues (2013) found that 80% of Canadian adolescents who were prescribed an antidepressant by a primary care provider did not receive adequate follow-up visits, as defined by having three follow-up visits during the first 3 months of treatment. Similarly, a study by O'Connor and colleagues (2016) found that 40% of U.S. adolescents prescribed an antidepressant did not receive any follow-up care in the 3 months following the prescription of an antidepressant. Moreover, 68% of adolescents did not receive a reassessment of depressive symptoms in the 3 months following their initial depression diagnosis (O'Connor et al., 2016). Although these studies have examined important aspects of adolescent depression treatment and follow-up, they have done so within a short time frame and may have missed follow-up services that occurred several months following initial screening and diagnosis. As many studies have demonstrated that adolescent depression is a complex disorder (Eapen & Črnčec, 2012) and has a high potential to recur in the future (Thapar et al., 2012), it is important to consider how adolescent depression treatment evolves over more extended periods.

It is essential not only to characterize current practice patterns but also to understand factors that lead to adherence and nonadherence to recommendations to promote higher adherence to best practice management of adolescent depression in primary care. Some factors that impact patients' receipt of appropriate follow-up care may be outside the typical scope of the primary care provider. For instance, a review of adherence research found that side effects, difficulty getting prescriptions filled, cost, low social support, lack of accessibility, and negative attitudes toward treatment affected adherence to treatment across a range of physical and mental health conditions in adolescent and adult populations (Jin, Sklar, Min Sen Oh, & Chuen Li, 2008). In a recent review focused on adolescents, poor social support and coerced treatment were associated with nonadherence to psychiatric treatment for adolescents experiencing a variety of mental health conditions (Timlin, Hakko, Heino, & Kyngäs, 2014). More research is needed to determine factors that impact adherence to mental health treatments among adolescents (Häge et al., 2018; Timlin et al., 2014). To our knowledge, no studies have examined the reasons for nonadherence to treatment for adolescents being treated for depression in primary care. As most adolescents are treated for depression in primary care, it is important to explore patient, family, and provider factors that impact adherence to depression treatment.

The current study examined patterns of adolescent depression treatment in the primary care setting using retrospective chart review data. The purpose of this study was to examine the rates of depression symptom assessment, psychotherapy referral, antidepressant prescription, and treatment discontinuation over 2 years among a group of adolescents screening positive for moderate and severe depression in the primary care setting. The specific aims of the study were to (1) determine how many adolescents received treatment for depression; (2) determine what

percentage of adolescents received depression follow-up care according to AAP GLAD-PC recommendations; (3) determine how many adolescents discontinued prescribed depression treatment over time; and (4) explore the reasons why adolescents discontinued depression treatment.

METHODS

Study Design

This study consisted of descriptive, retrospective chart reviews for adolescent patients who screened positive for moderate or severe depression in two primary care clinics.

Participants and Setting

Participants were identified through a Computer Decision Support System (CDSS), called the Child Health Improvement through Computer Automation (CHICA) System, implemented by the research team in two primary care clinics. One component of the system is a Pre-Screener Form (PSF), which is administered to patients via tablet upon check-in to their well-child visits. The PSF consists of a 20-item tailored questionnaire, including screening items for depression, substance use, diet, and sexual behaviors, administered to adolescents between the ages of 12 and 20 years at their well-child visits. Based on patients' responses to these questions, a primary care provider worksheet is generated prioritizing the top six health needs of the patient with provider action prompts based on Bright Futures guidelines (Tanski, Garfunkel, Duncan, & Weitzman, 2010). A detailed description of the system has been described elsewhere (Aalsma et al., 2018; Anand, Biondich, Liu, Rosenman, & Downs, 2004; Anand, Carroll, Biondich, Dugan, & Downs, 2015; Carroll et al., 2013; Gilbert & Downs, 2015).

The primary care clinics where these visits took place were part of the local county hospital system in an urban Midwest city. Primary care providers at these clinics were primarily trained in pediatrics, with some being adolescent medicine board certified. The team received exempt institutional review board approval to conduct this study from the local university.

The research team created and tested an adolescent depression module (Aalsma et al., 2018). Adolescents aged 12–20 years were screened explicitly for depression on the PSF using the Patient Health Questionnaire-2 (PHQ-2; Richardson et al., 2010b) with a reflex Patient Health Questionnaire-9 (PHQ-9; Richardson et al., 2010a). Patients were first asked two items on the PHQ-2, which assess for anhedonia and depressed mood in the past 2 weeks. If patients answered either of these questions affirmatively, the PHQ-9 was automatically administered and scored. A score of 5–9 indicated mild depression; a score of 10–14 indicated moderate depression; and a score of >14 indicated severe depression (Kroenke, Spitzer, & Williams, 2001). It should be noted that Richardson and colleagues (2010a) recommend a PHQ-9 cutoff >10 for adolescent patients; however, the study team chose a lower cutoff to identify more youth who may need follow-up for depression management in

primary care. Primary care providers were given guidance on next steps according to AAP GLAD-PC guidelines based on the patient's PHQ-9 score.

Adolescents were included in the sample for this study if they were aged 12–20 at their first positive depression screening with the CDSS and scored in the moderate or severe range on the PHQ-9 (score > 9; Kroenke et al., 2001). The team chose to focus the chart reviews on these patients as the AAP recommends antidepressant medication and psychotherapy treatment for patients with moderate to severe depression (Cheung et al., 2007; Cheung et al., 2018). Although the AAP recommends that primary care providers conduct a diagnostic interview after a positive self-report screening (Cheung et al., 2007; Cheung et al., 2018), individuals without a diagnosis of depression in their medical record were not excluded from the analysis to determine how all individuals screening positive for moderate or severe depressive symptoms received follow-up care over time. Individuals were excluded from analysis if they did not have a complete clinic visit record ($n = 3$).

Chart Abstraction

Retrospective chart reviews were conducted on all patients with a PHQ-9 score >9 from October 2014 to December 2016. All initial positive depression screenings occurred in 2014 or 2015. Primary care provider notes for each primary care visit from 2014 to 2016 were reviewed, and data related to the variables in Table 1 were entered into a spreadsheet. The patients' records were split and initially reviewed by three trained coders. Each primary care visit was entered into a separate row in the spreadsheet, and reviewers placed data into columns based on the variables in Table 1.

Data Analysis

Two reviewers recoded a randomly selected 20% of patients' charts to calculate interrater reliability. The pooled kappa was 0.71, indicating substantial agreement (Landis & Koch, 1977). Descriptive statistics were calculated using IBM SPSS, version 24, for statistical analysis (2016) to address the first three aims. For aim three, the AAP GLAD-PC (Cheung et al., 2007) recommendations released in 2007 were used as the standard by which adherence to best practice guidelines was determined. GLAD-PC was updated by the AAP in 2018 (Cheung et al., 2018) with recommendations regarding depression management training, integrated depression care, and universal depression screening for primary care providers (Cheung et al., 2018). However, as the medical record visits used for analysis took place before the release of these updated recommendations, the 2007 GLAD-PC recommendations were used to determine adherence to best practice guidelines. In addition, guidelines related to the ongoing management of depression in the primary care setting did not change substantially between the 2007 and 2018 publications (Cheung et al., 2007; Cheung et al., 2018).

For aim four, qualitative descriptive content analysis methods were used to determine reasons for discontinuing

TABLE 1. Variables extracted from the medical record

Variable label	Description	Response scale
Date of visit	Date of primary care visit	Date
PHQ-9 score	PHQ-9 score at visit used to determine if and when individuals received symptom reassessments	Numeric score
Comorbid diagnoses	Any diagnoses listed in the medical record, including depression diagnoses	Free response
Not depressed/no concerns	Visits in which the provider noted that the patient was no longer depressed	Yes/no
Started on SSRI	Visits in which the provider initiated SSRI	Yes/no
Maintain dose	Visits in which the provider maintained the SSRI dose	Yes/no
Increase dose	Visits in which the provider increased the SSRI dose	Yes/no
Decrease dose	Visits in which the provider decreased the SSRI dose	Yes/no
SSRI change	Visits in which the provider switched the patient to a different SSRI	Yes/no
SSRI stop	Visits in which the provider noted the patient had discontinued use of the SSRI	Yes/no
Psychotherapy referral	Visits in which the provider referred the patient to psychotherapy	Yes/no
Psychotherapy not interested	Visits in which the patient reported they were uninterested in psychotherapy	Yes/no
Psychotherapy attending	Visits in which the provider noted that the patient was currently attending psychotherapy	Yes/no
Reasons for stopping SSRI	Any reason noted in the chart related to the patient's discontinuation of the SSRI	Free response
Reasons for stopping psychotherapy	Any reason noted in the chart related to the patient's discontinuation of psychotherapy	Free response
Depression not mentioned	Any visits in which depression was not mentioned in the provider note	Yes/no

Note. PHQ-9, Patient Health Questionnaire-9; SSRI, selective serotonin reuptake inhibitor.

selective serotonin reuptake inhibitor (SSRI) medications and psychotherapy among all patients. Primary care provider notes were reviewed for any information regarding reasons for SSRI or psychotherapy discontinuation. Conventional content analysis methods were used to derive categories from the textual data without having predefined categories, allowing the categories to emerge from the data (Hsieh & Shannon, 2005). Two individuals reviewed the qualitative data independently, placing similar reasons for discontinuation of SSRIs and psychotherapy into categories. The two reviewers then met to determine the final categories of reasons for SSRI and psychotherapy discontinuation based on consensus.

RESULTS

Eighty youth met the inclusion criteria. Patients were, on average, 15.25 years old (standard deviation [*SD*] = 2.3) at the first positive depression screening. Seventy-three percent (*n* = 58) were female. Most of the sample was Black (*n* = 47, 59%). The remainder of the sample was Hispanic (*n* = 10, 12.5%), White (*n* = 8, 10%), or of other/unknown race or ethnicity (*n* = 15, 19%). Individuals averaged 4.2 (*SD* = 3.1) visits with a primary care provider over the 2-year review period. The average number of primary care visits in which depression was

addressed was 3.1 (*SD* = 2.3). The average PHQ-9 score at the first positive screening was 14.4 (*SD* = 3.6). Records indicated that 71.3% (*n* = 57) of adolescents with a positive depression screening had a documented depression diagnosis during the review period. Primary care was provided by clinicians trained in pediatrics (*n* = 15, 33%), family medicine (*n* = 11, 24%), pediatric or family nursing practice (*n* = 7, 15%), adolescent medicine (*n* = 5, 11%), medicine-pediatrics (*n* = 3, 6.5%), internal medicine (*n* = 2, 4%), and other medical specialties (*n* = 3, 6.5%).

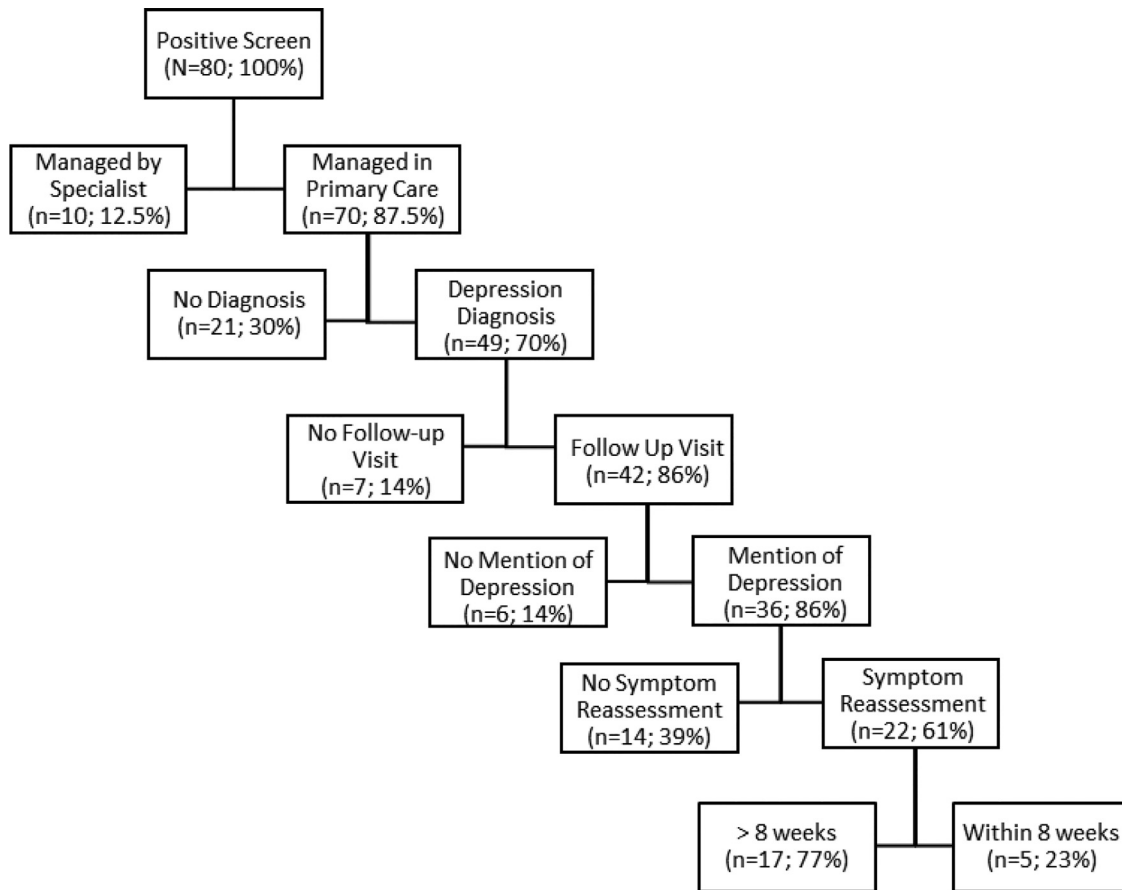
Rates of Depression Treatment

Rates of treatment according to depression diagnosis are presented in Table 2. A total of 83% (*n* = 66) of records indicated that the patient received depression treatment during the review period. Of these adolescents, 98% (*n* = 56) with diagnoses of depression received treatment for depression during the review period. Forty-three percent (*n* = 10) of adolescents screening positive for moderate or severe depression but not receiving a diagnosis of depression received treatment for depression. Most participants received psychotherapy alone or a combination of psychotherapy and SSRI prescriptions. Eighteen percent (*n* = 14) of patients did not receive any treatment for depression over

TABLE 2. Rates of depression treatment according to depression diagnosis over 2-year period

Treatment type (<i>N</i> = 80)	Depression diagnosis (<i>n</i> = 57), <i>n</i> (%)	No depression diagnosis (<i>n</i> = 23), <i>n</i> (%)
Antidepressant prescription only	4 (7)	0 (0)
Psychotherapy referral only	23 (40)	8 (35)
Both psychotherapy referral and antidepressant prescription	29 (51)	2 (8.5)
No depression treatment	1 (2)	13 (56.5)

FIGURE 1. Rates of depression follow-up care. Flow diagram depicting rates of depression follow-up care for adolescents according to the American Academy of Pediatrics Guidelines for Adolescent Depression in Primary Care.



the review period according to the medical record; most of these individuals did not have a documented diagnosis of depression.

Rates of Depression Treatment Follow-Up According to GLAD-PC

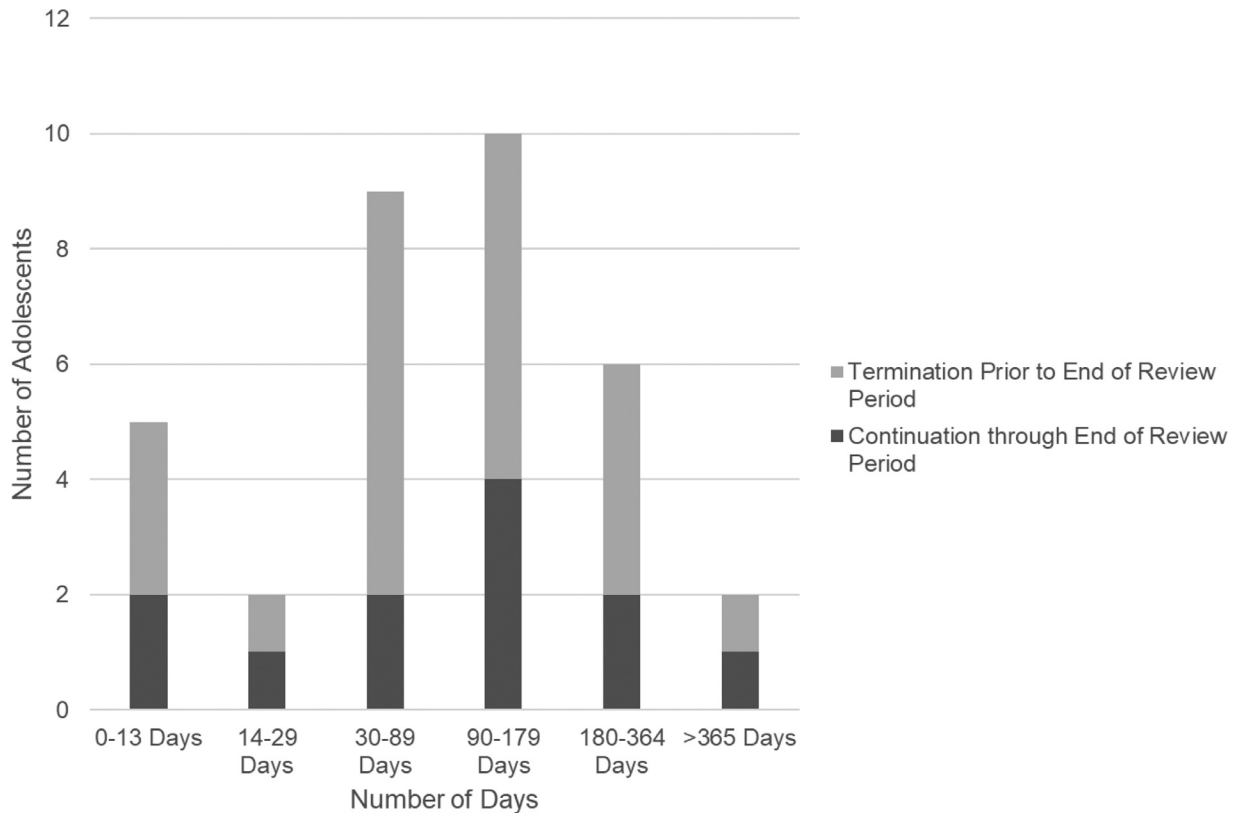
The rates of various depression follow-up actions are depicted in Figure 1. Of the 80 patients, 12.5% ($n = 10$) were referred to a mental health specialist for medication and psychotherapy management outside of primary care. Of those who were not referred to a mental health specialist ($n = 70$), records indicated that 70% ($n = 49$) received a diagnosis of depression. Of those with a diagnosis of depression, 14% of patients ($n = 7$) did not have any follow-up visits with a primary care provider; these individuals were diagnosed with depression and never returned for a primary care visit within the hospital system. Records indicated that 86% of patients ($n = 42$) with diagnoses of depression did have subsequent visits with a primary care provider. For 14% of patients ($n = 6$) who had additional primary care visits, there was no mention of depression in the visit record; these individuals were diagnosed with depression and returned to the clinic for visits, but none of those visits

addressed symptoms of depression. Eighty-six percent of patients ($n = 36$) had subsequent follow-up visits in which concerns with depression were documented in the medical record. Sixty-one percent ($n = 22$) with follow-up visits addressing depression had a documented symptom reassessment of depressive symptoms using the PHQ-9. The remaining 39% of patients ($n = 14$) attending visits where depression was addressed did not have a documented symptom reassessment. Of those with symptom reassessments, five (23%) received them within the recommended period (6–8 weeks).

Rates of and Reasons for Treatment Discontinuation

Of the patients who received treatment for depression, 45% ($n = 30$) discontinued their depression treatment during the review period. For 83% of patients ($n = 25$) who discontinued treatment, primary care providers documented a reason for discontinuation of depression treatment. Of those prescribed an antidepressant, 69% ($n = 24$) discontinued treatment, and of those referred to or already attending psychotherapy, medical records indicated that 24% ($n = 15$) stopped attending psychotherapy. Four individuals

FIGURE 2. Duration of selective serotonin reuptake inhibitor (SSRI) treatment. Chart depicting duration of medication use in days for the 27 patients who were prescribed SSRI medication that was managed by a primary care provider. Records indicated that seven patients started and stopped antidepressant medication two times during the review period. Data in this chart reflect instances of initial SSRI uptake for all patients ($N = 27$) as well as second-round SSRI uptake ($n = 7$).



discontinued antidepressant treatment, and two individuals discontinued psychotherapy due to the resolution of depressive symptoms, as noted in the medical record.

When records indicated that participants terminated treatment for any reason other than the resolution of depressive symptoms, participants were considered to have prematurely discontinued depression treatment. For 17 patients, providers documented reasons for premature discontinuation of antidepressants, including adverse side effects ($n = 5$), prescription refill issues ($n = 4$), inability to afford treatment ($n = 3$), negative personal attitudes toward antidepressants ($n = 3$), and family resistance to antidepressant treatment ($n = 3$). For three patients, personal attitudes and family resistance to antidepressant treatment prevented patients from initiating antidepressant treatment after it had been prescribed. Most patients prescribed SSRIs also terminated the use of SSRI medication before 1 year of use, in contrast to the recommendation by the AAP (see Figure 2; Cheung et al., 2007).

Providers documented reasons for premature discontinuation of psychotherapy for eight patients. Reasons for premature discontinuation of psychotherapy noted in the medical record included lack of therapist availability ($n = 4$),

family transitions (e.g., moving; $n = 3$), disinterest in psychotherapy ($n = 3$), and cost ($n = 1$).

DISCUSSION

Many adolescents who receive treatment for depression obtain it within the primary care setting, and although guidelines exist for the treatment of adolescent depression in this setting, this study showed that most adolescent patients might not receive depression follow-up care according to best practice guidelines, even within the context of a CDSS that supports adolescent depression screening and subsequent management.

The current study demonstrated that 83% of adolescents screening positive for moderate or severe depression received some form of depression treatment during the 2-year review period, and almost all adolescents (98%) with a diagnosis of depression received depression treatment during the review period. O'Connor and colleagues (2016) found that treatment was initiated for 79% of adolescents within the first 3 months of receiving a depression diagnosis, although Soria-Saucedo, Walter, Cabral, England, & Kazis (2016) reported a lower rate of 58% of youth receiving necessary treatment for depression. The use of a CDSS to

screen for depressive symptoms and prompt provider responses to depressive symptoms may explain the higher rates of treatment initiation, as using a CDSS is well known to improve adherence to other screening and treatment protocols (Murphy, 2014). Over time, adolescents experiencing depression may have a progressively increasing likelihood of being connected to treatment, also potentially explaining the higher rates of treatment initiation in the current study.

The current study also examined the rates of adherence to AAP GLAD-PC depression management recommendations. Records indicated that, of those diagnosed with and treated for depression in the primary care setting, 86% of patients received some form of follow-up care related to their depression, and 10% received a documented symptom reassessment within the recommended 8-week period, consistent with AAP guidelines. O'Connor et al. (2016) found similar rates of depression follow-up care (81%) and higher rates of symptom reassessment within 3 months (32%). Even within the context of the CDSS that was used in the current study, symptom reassessment rates according to best practice guidelines were still low. Further development of the CDSS to more precisely identify patients who should be scheduled at sooner intervals based on screening and diagnosis results, readminister symptom checklists, and prompt primary care provider responses based on symptom reassessments may improve provider management of adolescent depression follow-up care and promote greater adherence to AAP GLAD-PC recommendations (Koposov et al., 2017).

This study is one of the first to examine the rates of discontinuation of depression treatment among adolescents in the primary care setting, with medical records indicating that 45% of patients prescribed to antidepressants or referred to psychotherapy discontinued their treatment. This is similar to what was found in a recent study by Cummings, Ji, Lally, & Druss (2019), in which 50% of Medicaid-enrolled youth diagnosed with depression did not receive minimally adequate treatment for depression (i.e., >3 psychotherapy visits and/or >144 days of antidepressant refills) in the 6 months following a diagnosis of depression. The rate of treatment discontinuation observed in our study is also similar to overall rates of depression treatment discontinuation noted among adult populations (40%; Fortuna, Alegria, & Gao, 2010; Mowbray, Campbell, Kim, & Scott, 2018). In particular, adolescents who were prescribed antidepressant medication had high rates of discontinuation. Provider notes revealed that most of these adolescents did not continue the use of SSRIs for the recommended 1-year period (Cheung et al., 2007).

One reason that rates of psychotherapy discontinuation may have been lower is that adolescents receiving psychotherapy would have a more continual source of support to troubleshoot any issues with treatment, boost motivation, and encourage treatment engagement (Hamrin & Iennaco, 2017; Hamrin, Sinclair, & Gardner, 2017). If adolescents are prescribed medications without the support of a mental health professional, they may not have sufficient support to continue with treatment, especially if they have not received

education about what to expect or how to troubleshoot problems with their medication. In addition to engaging adolescents in psychotherapy when adolescents are prescribed an antidepressant medication, a CDSS or other form of technology could be used to improve patient adherence to depression treatment protocols by messaging adolescents or caregivers within 1–2 weeks of starting a medication to conduct automated or highly structured assessments concerning side effects, problems with prescription refills, or other general questions or concerns. Many of the reasons for discontinuation listed in the medical record were similar to those that have been observed across a range of health treatments, such as cost, lack of family support for treatment, issues with prescription refills, and medication side effects (Jin et al., 2008). In the current study, adolescents' attitudes toward psychotherapy and antidepressant medication also were common reasons for discontinuing treatment. To improve treatment engagement, primary care providers should assess barriers to engagement, such as patient and caregiver beliefs about treatment for depression at the onset of treatment. If patients endorse negative attitudes toward treatment, providers can deliver psychoeducation regarding the causes of and treatments for depression (Li, Dorstyn, & Denson, 2014) or match patients' beliefs about depression to corresponding treatments (Vittengl, Clark, Thase, & Jarrett, 2019). For example, psychotherapy may be a more appropriate treatment option for patients who do not endorse beliefs about the biological etiology of depression (Vittengl et al., 2019). It is also possible that discussing expectations about treatment and troubleshooting solutions to potential problems before they occur may promote adherence to prescribed depression treatments (Rush & Thase, 2018). Strategies such as shared decision aids (Simmons, Elmes, McKenzie, Trevena, & Hetrick, 2017) or brief motivational interviewing sessions delivered in the primary care setting (Hamrin & Iennaco, 2017) may also help boost adolescents' adherence to psychotropic medications for depression. The integration of behavioral health services into the primary care setting may also assist in addressing barriers to treatment engagement, such as lack of therapist availability (Richardson, McCarty, Radovic, & Suleiman, 2017).

This study was limited by the use of the medical record as a method for determining rates of depression treatment and follow-up. Individuals may have received care for depression that was outside of the health system network or not documented in the medical record. In addition, reasons for the discontinuation of treatment by adolescents may not have been noted in their medical records. The current study only examined records associated with primary care visits; visit records for other providers, such as social workers and mental health specialists, were not included in the analysis and may have contained important information about depression management. It appeared that some of the adolescents included in the study obtained mental health treatment outside of the health care system. Thus, to remain consistent, we decided only to examine primary care provider notes concerning depression follow-

up care. During data abstraction, the health care system migrated to a new electronic health record platform, and during this process, three patient records were found to have missing appointment information. Other information may have been missing from patient records after the migration, of which the team was unaware.

This study also has limited generalizability, given the composition of the sample and data collection setting. First, the sample in this study was small, and most patients were female and Black. Most primary care providers involved in caring for participants were also trained in pediatrics and may have received more specialized training in managing pediatric mental health concerns than other specialties such as family or internal medicine primary care providers. Furthermore, all participants were identified by CDSS, which was implemented in two primary care clinics. Research should be conducted to determine rates of depression follow-up care in larger, more representative samples.

CONCLUSION

Despite the small sample size, the findings of the current study suggest that many adolescents receiving treatment for depression in the primary care setting may not be receiving follow-up care for depression according to AAP guidelines and prematurely discontinuing depression treatment. Although using a CDSS to screen adolescents for depressive symptoms may improve treatment initiation, ensuring that adolescents receive follow-up care for depression remains a challenge. Because of the complexity of depression and the high possibility for recurrence in the future, strategies should be developed to improve rates of depression treatment follow-up and adherence to best practice guidelines within the primary care setting.

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SUPPLEMENTARY MATERIALS

Supplementary material associated with this article can be found in the online version at <https://doi.org/10.1016/j.pedhc.2019.07.002>.

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