



# Improving Adolescent Depression in Primary Care: A Quality Improvement Initiative

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## ABSTRACT

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The coronavirus disease 2019 pandemic has exacerbated and increased the prevalence of depression in adolescents. There is significant evidence supporting best practices for treating adolescent depression; yet, many adolescents remain unidentified or untreated by their primary care provider. For this quality improvement initiative, the Guidelines for Adolescent Depression in Primary Care (GLAD-PC) were implemented in a primary care setting. After GLAD-PC implementation, 90% of participants identified as having depression received an intervention compared with 60% of patients in the baseline group. The results showed that implementing GLAD-PC led to a significant increase in the treatment of adolescent depression in primary care.

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Adolescent depression is a prominent issue in the United States (US).<sup>1</sup> In 2020, Mental Health America reported that 13% of adolescents experienced at least 1 major depressive episode, with >9% having severe major depression and only 50% receiving treatment before adulthood.<sup>2,3</sup> Depression in adolescence hinders normal development by interfering with social, emotional, cognitive, and academic achievements and can lead to anxiety, substance abuse, and suicidal behavior, all of which increase the risk of morbidity and mortality.<sup>3,4</sup>

Two-thirds of adolescents with depression go unidentified by their primary care provider.<sup>1</sup> Furthermore, only half of those identified as having depression are treated appropriately, and even fewer follow through and complete their referral to a mental health specialist.<sup>1,3</sup> Increasing the proportion of children with mental health problems who receive treatment is one of the Healthy People 2030 goals.<sup>5</sup> This project aimed to improve the quality of treatment of depression for adolescents aged 12 to 17 years in the primary care setting.

## Practice Problem

Despite the published recommendations for screening and treatment for adolescent depression, providers struggle to diagnose, treat, and monitor adolescent patients with depression. Adolescent patients at the project implementation site are screened for depression annually or at the provider's discretion with the Patient Health Questionnaire-2 (PHQ-2) or with the Patient Health Questionnaire-9 (PHQ-9). However, of 505 adolescent patients who screened positive for depression (PHQ-9 score  $\geq 5$ ) from January

2021 to May 2021, 203 (40%) did not receive care or had documentation of receiving any care, leaving these patients without treatment for their depression.

This project aimed to improve the quality of adolescent depression treatment by 20% in 5 months by implementing the Guidelines for Adolescent Depression in Primary Care (GLAD-PC), used with permission of the GLAD-PC Steering Committee (REACH Institute, [www.TheReachInstitute.org](http://www.TheReachInstitute.org)).<sup>3,6</sup>

## Literature Review

A systematic appraisal of available evidence was performed to examine the research on improving the treatment of adolescent depression in a primary care setting. Typically, organizations have standards of care for depression in the primary care setting, such as antidepressant medication, referral for outpatient psychotherapy, or a combination of both.<sup>7</sup> However, the literature reviewed provided insight into the lack of consistency of treatment, leading to inappropriate depression treatment or lack of follow-up. For example, Stafford et al<sup>4</sup> found that 40% of adolescents prescribed an antidepressant did not receive the appropriate follow-up recommended by the American Academy of Pediatrics and GLAD-PC.

The US Preventive Services Task Force and American Academy of Pediatrics recommend universal depression screening with a self-report screening tool for adolescents  $\geq 12$  years old at annual health maintenance visits in primary care settings.<sup>1,8,9</sup> Zuckerbrot et al<sup>3</sup> suggested screening adolescents annually, and patients at risk should be identified and systematically monitored. Unfortunately, two-thirds of adolescents with depression go unidentified despite

the annual screening recommendation, and an opportunity for treatment and suicide prevention is lost.<sup>1</sup>

In 2007, leading experts across the US and Canada worked together to address the knowledge gap pertaining to the treatment of adolescent depression.<sup>3</sup> The result of this collaboration was the development of GLAD-PC.<sup>3,6</sup> The guideline was specifically developed to provide some much-needed information, recommendations, educational resources, and tools to aid in the management of adolescent depression in a primary care setting. GLAD-PC highlights 6 areas of recommendation for practices to manage care for adolescent depression: (1) practice preparation, such as training staff, (2) identification of adolescents in need of screening, (3) diagnosing based on screening, (4) initial management with educating families and creating a safety plan, (5) initiating treatment based on the severity of depression, and (6) ongoing management, including referrals and follow-up.<sup>6</sup>

Various authors have mentioned the use of GLAD-PC to improve depression screening. Kemper et al<sup>10</sup> screened 803 adolescents with no history of depression or self-harm, resulting in 56.4% screening positive for any depression. Rinke et al<sup>11</sup> demonstrated a 3.9% increase in depression diagnoses using selected parts of the GLAD-PC.

Stafford et al<sup>4</sup> conducted a retrospective medical record review for 2 primary care clinics that used the 2007 GLAD-PC guidelines for all patients with a PHQ-9 score >9 in the age range of 17 to 20 years. The authors found that 83% of participants who screened positive for moderate or severe depression received some form of depression treatment.<sup>4</sup> Of those who received initial treatment from their primary care provider, 86% had a follow-up visit with their primary care provider related to their depression, but only 72% had documentation of depression in their visit record. Only 61% of the patients who followed up for their depression had documented reassessment of depressive symptoms using the PHQ-9 screening tool.<sup>4</sup> No studies were found that implemented or analyzed the efficacy of implementing all 6 of the 2018 GLAD-PC recommendations.

Providers may hesitate to screen because of discomfort, lack of time, or competing priorities.<sup>1,7,9</sup> Zuckerbrot et al<sup>3</sup> suggested educating primary care providers with practical training, such as depression identification, evaluation of suicide risk, and initial management of adolescent depression. Effective training improves the primary care provider's behaviors, attitudes, and intention to adopt the new practice. Primary care providers who view psychosocial treatment as burdensome are less likely to identify mental health problems.<sup>3</sup> The GLAD-PC provides the guidelines for treatment and various resources for providers, parents, and adolescents.<sup>3,6</sup>

## Framework

The Iowa Model-Revised was used to guide the project steps.<sup>12</sup> The Iowa Model-Revised was selected due to its logical multiphase change process with feedback loops and its integration of quality improvement (QI). The model guides clinicians to move forward based on reflecting analysis.<sup>2</sup> In addition, the model is easy to follow for novice clinicians.

Plan-Do-Study-Act (PDSA) was used within the fifth step of the Iowa Model-Revised during the implementation phase.<sup>13</sup> The *Plan* phase involved a comprehensive review of available literature for an evidence-based guideline for treating adolescent depression. Institutional Review Board (IRB) approval was obtained, followed by a provider educational session that included data on adolescent depression, the practice problem, and how to diagnose and treat adolescent depression based on PHQ-9 scores using the GLAD-PC.

The implementation, or *Do*, phase involved 5 months of weekly data collection and medical record reviews for accuracy and compliance with the GLAD-PC.

The *Study* phase included weekly to biweekly email reminders on compliance with GLAD-PC and monthly updates as needed during the QI, provider, and stakeholder meetings.

Results were reviewed in the final phase, *Act*, and initial data collection results showed the same providers continuing to not address the patients with a PHQ-9 score of  $\geq 5$ . A change to notifying providers on compliance with the guideline was made based on this data. In addition to receiving an email, providers were sent individual instant messages through the athenaNet (AthenaHealth) medical record charting system about their compliance with the guideline and the patient medical record number for their review. More provider feedback was received through instant messaging than through email. The PDSA cycle was restarted and analyzed, reflecting positive changes and resulting in the GLAD-PC being implemented as the clinic standard of practice for adolescent depression management.

## Methods

The project question was: Among adolescents aged 12 to 17 years who have a PHQ-9 score of  $\geq 5$ , does implementing the GLAD-PC, compared with current practice, improve the organization's percentages for follow-up visits, referrals to qualified practitioners to diagnose and treat, or the initiation of pharmacologic interventions, in 5 months?

### Setting

The QI initiative took place in a standalone community family health clinic in Chicago, Illinois, mainly serving Medicaid, Medicare, and uninsured patients.<sup>14</sup> The clinic provides medical, dental, and vision services for all ages and sexes and serves predominantly Hispanic patients. The clinic employs 1 family practice physician, 2 pediatricians, 2 pediatric nurse practitioners (NPs), 1 physician assistant, 5 family NPs, 1 registered nurse, 1 licensed practical nurse, several medical assistants, and other ancillary staff.<sup>14</sup>

### Ethical Consideration

This initiative was determined not to be human subject research by the Illinois State University Institutional Review Board and was identified as QI.

### Depression Screening Tool

The PHQ-2 comprises the first 2 items in the PHQ-9 screening tool. For the PHQ-2, patients answer 2 questions about the degree to which they have experienced a depressed mood during the past 2 weeks. The PHQ-2 does not establish the final diagnosis or severity of depression but screens for depression and leads to further evaluation with the PHQ-9.<sup>15</sup>

The PHQ-9 is a self-administered, 9-item questionnaire designed to screen for depression in primary care.<sup>16</sup> It is rapid and effective for detecting and monitoring the severity of depression. The questions assess how often a patient has been disturbed by any of the 9 items during the preceding 2 weeks. Each question is scored from 0 (not at all), 1 (several days), 2 (more than half the days), or to 3 (nearly every day).<sup>16</sup> Answers to the PHQ-9 are totaled to determine depression severity (0-4, no or minimal depression; 5-9, mild depression; 10-14, moderate depression; 15-19, moderately severe depression; 20-27, severe depression).<sup>3,6</sup>

The PHQ-2 and PHQ-9 screening tools are publicly available, and no permission is required to use, reproduce, or distribute the tool. The PHQ-2 has a reported sensitivity of 83% and a specificity of 92% for the detection of major depression. The PHQ-9 has a reported sensitivity of 88% and specificity of 88% for moderate to severe depression, with a Cronbach  $\alpha$  of 0.83.<sup>17</sup>

### Intervention

The providers completed a survey to assess their confidence level in treating adolescent depression. Providers then attended an educational PowerPoint (Microsoft) presentation about adolescent depression, the practice problem, and how to diagnose and treat adolescent depression based on PHQ-9 scores and using the GLAD-PC. Provider education also included vignettes and questions to promote using the GLAD-PC with clinical judgment. An immediate posteducation survey was administered to determine whether there was an increase in the confidence level for treating adolescent depression. Providers subsequently completed a survey 3 months after training to reassess their long-term confidence level for treating adolescent depression.

After completing training, providers were directed to use the GLAD-PC for any adolescent patient with a PHQ-9 score of  $\geq 5$ . If an adolescent was not treated based on the guidelines, the providers were instructed to document their rationale. All providers were emailed a copy of the GLAD-PC for download to their personally issued work computer, and a printed algorithm was distributed for use at their workstations. The project was implemented from February 2022 through July 2022.

### Medical Record Review

Medical record reviews were conducted on all patients aged 12 to 17 years with a PHQ-9 score of  $\geq 5$  from February 16, 2022, through July 16, 2022, regardless of the type of visit. Eligibility criteria included adolescents aged 12 to 17 years with a PHQ-9 score of  $\geq 5$ . Exclusion criteria included patients who were unable to complete the PHQ-9.

### Measure

The primary outcomes were follow-up visits for depression, referrals to qualified practitioners to diagnose and treat depression, initiation of pharmacologic intervention, and percentage of type of treatment selected for adolescents with a PHQ-9 score of  $\geq 5$ . An additional outcome measured was comparing baseline data with the postintervention implementation group to see whether a 20% increase occurred in interventions initiated for adolescents with depression. The final outcome measured was to evaluate provider confidence in treating adolescent depression as reported in their preeducation survey compared with the survey results 5 months after project implementation.

### Analysis

Outcomes were measured using descriptive and inferential statistics based on postimplementation data. Data were analyzed to survey trends in diagnosis, treatment, referral rates, initiation of pharmacologic intervention, and follow-up rates for depression after implementation of the GLAD-PC. Data were compared to the preintervention data group for any significance in treating adolescent depression. All data are presented as aggregated data, and tables are used to present the results.

**Table 1**  
Demographics of Participants<sup>a</sup>

Variable	Frequency (N = 593)	Percentage
Legal sex		
Male	183	30.9
Female	410	69.1
Race		
Black or African American	9	1.5
Other race	2	0.3
White	582	98.1
Ethnicity		
Dominican	1	0.2
Hispanic or Latino/Spanish	581	98
Not Hispanic or Latino	11	1.9
Age <sup>b</sup>		
12	95	16.0
13	96	16.2
14	111	18.7
15	92	15.5
16	102	17.2
17	97	16.4

<sup>a</sup> Demographics of participants with a positive Patient Health Questionnaire-9 score.

<sup>b</sup> Age is reported in total years.

## Results

### Provider Survey

Six surveys were collected among the 11 providers educated about the practice problem and the implementation of the GLAD-PC. Before project implementation, 4 of the 6 providers (67%) reported no knowledge of the GLAD-PC. After the GLAD-PC training, providers reported an increase in confidence for treating adolescent depression (mean, 2.00 [SD, 0.89]) compared with pretraining scores (mean, 1.33 [SD, 1.03],  $t_5 = -3.16$ ,  $P = .025$ ). At 3 months after the intervention, providers did not report any additional significant increase in confidence in treating adolescent depression (mean, 1.67 [SD, 0.82],  $t_5 = 1.58$ ,  $P = .175$ ) compared with the immediate posttraining scores.

### Demographics

During the data collection period, 1432 patients were eligible to be screened or were screened for depression. Of those patients, 56.8% ( $n = 813$ ) had a negative PHQ-9 screening, 41.4% ( $n = 593$ ) had a positive PHQ-9, 1.3% ( $n = 19$ ) were not screened during their visit, and 0.5% ( $n = 7$ ) were excluded because they were not able to complete the PHQ-9. Of the 593 participants with a PHQ-9 score of  $\geq 5$ , 69.1% ( $n = 410$ ) were girls, 98.1% ( $n = 582$ ) were White, and 98.0% ( $n = 581$ ) were Hispanic or Latino/Spanish. The mean age was 14.51 (SD, 1.69) years, with the participants ages ranging from 12 to 17 years. Table 1 summarizes participant demographics. The participants' most frequent positive PHQ-9 score was 6 at 10.6% ( $n = 63$ ), and 44.5% ( $n = 264$ ) of participants reported having mild depression. Table 2 presents participants' depression severity based on their PHQ-9 score. Most visits for participants with a positive PHQ-9 were annual well-child visits, at 37.8% ( $n = 224$ ), followed by acute visits at 30.0% ( $n = 178$ ).

### Treatment Rendered

When selecting a treatment plan for adolescents with a PHQ-9 score of  $\geq 5$ , providers favored active support for 89.9% ( $n = 533$ ) of patients, which included monitoring symptoms, providing local

**Table 2**  
Depression Severity<sup>a</sup>

Depression Severity	Frequency (N = 593)	Percentage
Mild depression	264	44.5
Moderate depression	162	27.3
Moderately severe depression	109	18.4
Severe depression	58	9.8

<sup>a</sup> Severity is based on the interpretation of the participant's total score on the Patient Health Questionnaire-9 questionnaire.

resources, and a follow-up plan. Referral to counseling (58.9% [n = 349]) was the second favored treatment selected. In addition, providers referred 9.3% (n = 55) of participants to behavioral health specialists such as psychiatrists, psychiatric NPs, or psychologists. Providers scheduled 84.3% (n = 500) of the participants for follow-up and prescribed medication for 18.0% (n = 107). **Table 3** summarizes all other treatments and frequencies. Of the 272 participants due for a follow-up during the data collection period, 70.0% (n = 190) completed their follow-up appointment, but 30% (n = 82) did not show up, did not schedule a follow-up, or canceled their appointment. Follow-up intervals were based on the patient's severity and the provider's clinical judgment.

#### Treatment Based on Depression Severity

For each level of depression severity, providers scheduled a follow-up >80% of the time, with patients with moderately severe depression having a higher rate of scheduled follow-ups at 93.6% (n = 102). However, adolescents with moderately severe depression (PHQ-9 score of 15-19) had the lowest rate of completing their follow-up appointment at 57.1% (n = 36), followed by adolescents with moderate depression (PHQ-9 score of 10-14) at 66.2% (n = 47). Adolescents with severe depression (PHQ-9 score of 20-27) were more frequently referred to a behavioral health specialist at 29.3% (n = 17), followed by those with moderately severe depression (PHQ-9 score of 15-19) at 14.7% (n = 16). Providers continued or initiated pharmacologic interventions most frequently with adolescents reporting severe depression (PHQ-9 score of 20-27) at 43.1% (n = 25).

#### Preintervention and Postintervention Group

With preintervention data limited to only percentages and not the type of treatment rendered, the comparison of both groups is limited. In the preintervention group, 60% (302 of 505) of adolescents received an intervention for their positive PHQ-9 score. In the postintervention group, 90% (534 of 593) of adolescents received an intervention for their positive PHQ-9 result. Treatment of adolescent depression increased by 30% in 5 months, so the project aim of improving adolescent depression by at least 20% was achieved. The results suggest that implementing the GLAD-PC increased the treatment of adolescent depression at the project site.

#### Discussion

Adolescent patients presenting with depression will be a daily occurrence in the primary care setting and can no longer be dismissed or ignored. Organizational data reveal a significant number of adolescents with major depressive disorder, at 55%, compared with the national average of 13% in 2020.<sup>2</sup> Increased rates of depression could be a possible sequela of the coronavirus disease 2019 pandemic with mandatory isolation and home school for adolescents.

**Table 3**  
Treatment Rendered<sup>a</sup>

Treatment	Frequency (N = 593)	Percentage
Active support	533	89.9
Referred to counseling	349	58.9
Referred to psychiatrist	54	9.1
Referred to psychologist	1	0.2
Medication initiation	107	18.0
Referred to emergency department	11	1.9
No treatment	61	10.3
Other	114	19.2
Scheduled follow-up	500	84.3

Guidelines for Adolescent Depression in Primary Care.

<sup>a</sup> Treatment options were based on recommendations from the GLAD-PC.

Various resources are available for primary care providers to use to aid them in their treatment of adolescent depression. This QI initiative shows that providers' comfort level in treating adolescent depression can improve and that adolescents can receive early interventions in the primary care setting. Presenting provider education on the organizational problem, providing an easy-to-follow resource, and having a peer reminding them of the overall goal were influential to the success of the QI initiative.

Active support was the provider's most frequent treatment option. Active support included close monitoring, talking to the parent and patient about treatment options, and providing information on local resources. For some adolescents, providers used an additional internal resource labeled as "other" in the data collection. This treatment option is the in-house care coordinators, who would speak to the parents and patients more in-depth about adolescent depression, clinic and local resources, and emergency information such as the Screening, Assessment, and Support Services (SASS) crisis line.

Instead of referring to the overwhelmed behavioral health community or simply prescribing an antidepressant, providers at the organization are addressing adolescent depression, taking ownership of their patients, facilitating coordination of care, and following up more frequently with adolescents with depression. Comprehensive management of adolescent depression is multifaceted and should include not only initial treatment but also close follow-up and referral to psychiatry if needed.

#### Limitations

The organization is currently implementing a new electronic pre-check-in process. An electronic PHQ-9 is being completed before the visit. However, whether the parent or the adolescent is completing the electronic PHQ-9 is unclear. An organizational solution to the problem was to administer a paper PHQ-9 during the visit, regardless of whether or not the electronic PHQ-9 was completed. Unfortunately, there continue to be system errors, with patients' in-office scores being deleted and overridden by the electronic pre-check-in score. When such cases presented themselves, the higher of the 2 scores was chosen for data collection and reported to the providers. The organization is aware of the situation and is working to rectify the technical error. Another limitation to this QI initiative is that generalizability is difficult because this project was at a single site.

#### Conclusion

The lack of behavioral health specialists to help deal with the surge of adolescent depression in local communities will likely be persistent. With other factors limiting adolescents from receiving



attention for depression, the primary care setting may be the first and only setting where adolescents can receive treatment. By standardizing adolescent depression treatment, we saw an increase in providers addressing adolescent depression. We encourage all other primary care settings to follow suit in improving the treatment of adolescent depression.

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