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Trajectories of Functioning Into Emerging Adulthood Following Treatment for Adolescent Depression

Amy T. Peters, M.A. [a], Rachel H. Jacobs, Ph.D. [a], Claudia Feldhaus [a], David B. Henry, Ph.D. [a], Anne Marie Albano, Ph.D. [b], Scott A. Langenecker, Ph.D. [a], Mark A. Reinecke, Ph.D. [c], Susan G. Silva, Ph.D. [d], and John F. Curry, Ph.D. [d,*]

[a] *Department of Psychiatry, University of Illinois at Chicago, Chicago, Illinois*
[b] *Department of Psychiatry, New York State Psychiatric Institute, New York, New York*
[c] *Department of Psychiatry and Behavioral Sciences, Northwestern University Feinberg School of Medicine, Chicago, Illinois*
[d] *Department of Psychiatry and Behavioral Sciences, Duke University, Durham, North Carolina*

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A B S T R A C T

Purpose: It is well established that empirically supported treatments reduce depressive symptoms for most adolescents; however, it is not yet known whether these interventions lead to sustained improvements in global functioning. The goal of this study is to assess the clinical characteristics and trajectories of long-term psychosocial functioning among emerging adults who have experienced adolescent-onset major depressive disorder.

Methods: Global functioning was assessed using the Clinical Global Assessment Scale for children (participants $\leq$18 years), the Global Assessment of Functioning (participants $\geq$ 19 years) and the Health of the Nation Outcome Scales for Adolescents among 196 adolescents who elected to complete 3.5 years of naturalistic follow-up subsequent to their participation in the Treatment for Adolescents with Depression Study. The Treatment for Adolescents with Depression Study examined the efficacy of cognitive behavior therapy, fluoxetine, and the combination of cognitive behavior therapy and fluoxetine (combination treatment) over the course of 36 weeks. Mixed-effects regression models were used to identify trajectories and clinical predictors of functioning over the naturalistic follow-up.

Results: Global functioning and achievement of developmental milestones (college, employment) improved over the course of follow-up for most adolescents. Depressive relapse, initial randomization to the placebo group, and the presence of multiple psychiatric comorbidities conferred risk for relatively poorer functioning.

Conclusions: Functioning generally improves among most adolescents who have received empirically supported treatments. However, the presence of recurrent major depressive disorder and multiple psychiatric comorbidities is associated with poorer functioning trajectories, offering targets for maintenance treatment or secondary prevention.

IMPLICATIONS AND CONTRIBUTION

The prognosis is positive for adolescents treated early for depression in regard to their ability to function as emerging adults, yet depressive recurrence and comorbid disorders cause some teens persistent problems in functioning. Perhaps, interventions specifically targeting functional outcomes could bolster sustained wellness during a critical period of development.

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* Address correspondence to: John F. Curry, Ph.D., Duke Child and Family Study Center, Duke University Medical Center 2608 Erwin Road, Suite 300 Durham, NC 27705.
E-mail address: john.curry@duke.edu (J.F. Curry).

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Major depressive disorder (MDD) with adolescent-onset leads to impaired functioning [1,2]. Functional impairment refers to limitations deriving from illness in social, occupational, and other important areas of daily life. It is differentiated from core psychological symptoms in that it represents how symptoms affect an individual's ability to meet or adaptively respond to various problems in living. Functional impairment may be particularly disruptive during the transition from adolescence to adulthood, which is a critical period for attaining key developmental milestones including attending college, obtaining employment, and learning to live independently [3]. During this time, questions of identity become paramount, catalyzed by the onset of puberty [4], increasing complexity of parental [5], peer, and romantic relationships [6,7] and rising expectations of independent functioning [8]. Viewed through this lens, transition from adolescence to young adulthood is a demanding developmental stage for even the well-adjusted adolescent. Limited research has examined how depression during this critical window affects how adolescents are able to meet these challenges [9].

Tragically, treatments that reduce depressive symptoms do not consistently improve functional impairment. Several trials of selective serotonin reuptake inhibitors (SSRIs) [10–12] either failed to improve functioning or did not report on these outcomes. One study of cognitive behavioral therapy (CBT) among youth with MDD [13], found no difference in global functioning compared with other psychotherapies, despite the superiority of CBT for depressive symptoms. In the Treatment for Adolescents with Depression Study (TADS), only one-third of adolescents achieved normalized functioning (i.e., "non-impaired" according to the Children's Global Assessment Scale; CGAS) after 12 weeks [14] and functioning outcomes were not reported at longer follow-up intervals. Improved functioning may simply take more time, as was evident in a study of antidepressants for adults with chronic MDD [15]. In addition, adolescence is a period of development characterized by naturalistic fluctuations in mood and functioning, which might obscure gains associated with treatment. However, opportunities to examine long-term functioning during the transition to adulthood have been limited to date.

Another explanation for the gap between symptom improvement and functioning is that one global rating is typically used to assess functioning rather than individual domains (i.e., family, peer, occupational, academic), making it difficult to understand functioning trajectories across development. It remains unknown whether global, domain-specific, or combined ratings of functioning best capture true impairment [16]. As a result, the two main diagnostic classification systems (The Diagnostic and Statistical Manual of Mental Disorders and International Classification of Diseases) use different functioning rating systems. However, no studies to our knowledge have evaluated the course and development of functioning using both approaches. One measure, The Health of the Nation Outcome Scale for Children and Adolescents (HoNOSCA; [17]) captures 13 specific domains of functioning. Unfortunately, only two studies examining adolescent depression over extended follow-up have used the HoNOSCA. One found no differences between combination treatment (SSRI and CBT) relative to SSRI alone [18]. Another found no differences between group therapy and routine care on rate of HoNOSCA change [19].

The complex presentation of adolescent depression may also relate to challenges achieving functional milestones. Adolescents with past depression are at high risk for relapse [20] and experience disproportionately high rates of comorbid disorders including anxiety [21], disruptive behaviors [22], and substance abuse [23]. Psychiatric comorbidity during adolescence is associated with poor treatment prognosis [24], greater risk of suicide [25], and persistence of psychopathology during adulthood [26]. Despite understanding of the clinical sequelae of psychiatric comorbidity, limited data examines how comorbidity affects specific domains of functioning. This may offer insight into potential targets for secondary, preventative, or maintenance interventions.

We examine functional outcomes in The Survey of Outcomes Following Treatment for Adolescent Depression (SOFTAD); an open, naturalistic follow-up lasting 3.5 years of adolescents who completed TADS [20]. SOFTAD is the largest follow-up of depressed adolescents who received treatment [20]. We examine trajectories of global functioning, as well as clinical attributes, including comorbidity profiles, which may confer risk for poorer functioning and interference with developmental milestones. We hypothesized that (1) functioning after treatment would be maintained among teens who received an active treatment; and (2) MDD relapse and comorbid psychiatric disorders would be associated with poorer functioning. As SOFTAD was not originally designed to examine these questions, these analyses are exploratory in the hopes of guiding future research on this understudied topic.

Methods

Study design

The design and characteristics of TADS [27] and SOFTAD [20] have been described. Adolescents in TADS (N = 439) were randomized to fluoxetine (FLX), CBT, combination treatment (COMB), or placebo (PBO) for 12 weeks of acute treatment. Treatment responders to the three treatments (FLX, CBT, and COMB) received 6 weeks of continuation treatment plus 18 weeks of maintenance treatment. "Nonresponders" [27] were referred to community treatment, offered 12 weeks of active treatment of their choice after the acute treatment phase, and then additional 12 weeks of uncontrolled continued care. Approximately 88% of PBO participants chose treatment with a TADS active treatment and approximately 80% continued with uncontrolled continued care after that [28]. After 36 weeks, all adolescents were followed naturalistically (i.e., no research intervention or restrictions on outside treatment) for 1 year. SOFTAD was an extended naturalistic follow-up for an additional 3.5 years.

Participants

All TADS participants could enroll in SOFTAD. Forty-six percent (n = 196) of TADS participants enrolled. Recruitment occurred at 12 of the 13 original sites. Demographic and clinical characteristics of SOFTAD participants have been described in relation to the TADS sample; specifically demographic characteristics at TADS baseline of SOFTAD participants were compared with participants who only did TADS [20]. The SOFTAD sample was younger, included fewer minority adolescents, was more likely to be experiencing their initial depressive episode, and had fewer comorbidities at TADS baseline.

Procedures

All procedures were approved by the sites respective institutional review boards. SOFTAD involved seven assessments every 6 months after the final TADS visit. Five assessments were clinic visits and two were completed via mail-in questionnaires. The