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Obsessive-compulsive disorder in youth and young adults with depression: Clinical characteristics of comorbid presentations

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Declarations

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Abstract

Obsessive-compulsive disorder (OCD), anxiety disorders, and depressive disorders are highly comorbid, and each contribute to significant functional impairment for affected youth. Comorbid anxiety disorders in depressed youth have been associated with greater depressive symptom severity and impairment, but the impact of comorbid OCD in this population remains unclear. Accordingly, the present study examined the differential clinical characteristics of youth with depression and comorbid OCD relative to age/gender matched depressed youth with no such comorbidity and to those with depression and a comorbid (non-OCD) anxiety disorder. A sample of 797 youth and young adults ages 8-20 years who met diagnostic criteria for depression alone, depression with co-occurring OCD or any anxiety disorder were included in the present study. Rates of comorbid anxiety and OCD were very high (60.5% and 15.5%, respectively). Relative to youth with only depression, depressed youth with comorbid OCD or anxiety had greater severity of depression, suicidality, and overall impairment in social, physical, and emotional functioning. These results highlight the contribution of OCD or anxiety comorbidity in more complex clinical presentations for depressed youth.

Keywords

Depression; Children; Adolescents; Obsessive-compulsive disorder; Anxiety; Comorbidity; Assessment

Introduction

Major depressive disorder (MDD) occurs with relatively high frequency in youth and young adults, with rates of new onset depression ranging from 1% to 2% at age 13 and from 3% to 7% at age 15 with incidence of depression continuing to rise through early adulthood (Lewinsohn et al., 1998). Evidence suggests that rates of adolescent depression are rising in the U.S., with the prevalence of past-year major depressive episodes (MDE) increasing from 8.1% to 15.8% between 2009 and 2019 (Daly, 2022). Depression adversely affects social, emotional, and academic functioning if left untreated (Birmaher et al., 2007). Comorbidity in youth depression is also common, with more than half of affected youth experiencing a comorbid condition, such as anxiety, disruptive behavior, or substance use disorders (Avenevoli et al., 2008; Avenevoli et al., 2015; Melton et al., 2016). Comorbidity amongst depressed youth is associated with greater functional impairment (Huppert et al., 2009) and attenuated treatment response (Avenevoli et al., 2015).

Anxiety disorders are the most common psychiatric comorbidity in youth with depression. Approximately half of children and adolescents with primary depression have co-occurring clinically significant levels of anxiety (Axelson & Birmaher, 2001; Cummings et al., 2014; Essau, 2008). Anxiety and depression co-occurrence in youth is associated with more severe depressive symptoms, higher levels of functional impairment, and poorer treatment outcomes (Melton et al., 2016). Less is currently known about the impact of co-occurring obsessive-compulsive disorder (OCD) in youth depressive disorders.

Characterized by intrusive, unwanted, distressing, and recurring thoughts (obsessions) and associated repetitive ritualistic behaviors (compulsions), OCD is a debilitating diagnosis, with an estimated prevalence of 1-3% in children and adolescents (Fawcett et al., 2020; Heyman et al., 2001; Lack et al., 2009; Piacentini et al., 2007). Youth who are diagnosed with OCD tend to experience overall poorer quality of life and have difficulty functioning in social, academic, and daily family domains (Coluccia et al., 2017; Piacentini et al., 2007; Storch et al., 2018). Given the impairing nature of OCD, this disorder may lead to the onset or worsening of co-occurring symptomology, including anxiety-related and mood disorders.

Unlike anxiety disorders, OCD has received relatively limited attention in terms of co-occurrence in youth with primary depression. Depressive disorders present as a relatively common secondary diagnoses to OCD in children (Bartz & Hollander, 2006; Pallanti et al., 2011; Storch et al., 2012) and, to a greater extent, in adolescence (Peris et al., 2017). When depression develops secondary to a primary OCD diagnosis, it can lead to increased symptom severity and impairment (Peris et al., 2010), suicidality (Angelakis et al., 2015), anxiety (Abramowitz et al., 2007), and attenuated intervention response (Abramowitz, 2004; Meyer et al., 2014). However, little is currently known about the incidence and clinical correlates when OCD is secondary to a depressive diagnosis and, although extant studies suggest that rates of secondary OCD in samples of depressed adults and youth range from 16-30% (Millet et al., 2004; Ricklet et al., 2016), little is known about additional clinical factors such as suicidality and levels of impairment (i.e., fatigue, peer relationships, engagement in social activities) across comorbid presentations.

Understanding the impact of secondary OCD in the context of depression in adolescents and young people is important for several reasons. First, the distressing nature of OCD-related symptoms may exacerbate the impact and course of mood disorders, such as MDD (Masellis et al., 2003). Understanding the co-occurrence of these disorders, their presentations, and examining their presence across various genders and age groups may contribute to improved precision screening of such comorbid disorders. For example, it is important to understand the phenomenology of MDD-OCD (and MDD-Anxiety) comorbidity to inform decision-making when selecting appropriate treatment modalities. Second, evaluating MDD comorbidity patterns may provide greater insight into risk factors for deleterious outcomes (e.g., compounded impairment, suicidality). Finally, treatment may differ among those with depression and OCD comorbidity, for example, by having dual targets with psychotherapy (i.e., behavioral activation for depression and exposure and response prevention for OCD). Understanding clinical characteristics as a function of comorbidity may elucidate potential treatment targets beyond symptom reduction.

The present study compared the clinical characteristics of three groups: depressed youth with no comorbidity, depressed youth with comorbid anxiety disorders, and depressed youth with comorbid OCD. We had four aims. First, we sought to examine the incidence of OCD among youth presenting with depressive disorders. Based on past studies (Millet et al., 2004; Ricklet et al., 2016), we predicted that approximately 20% of depressed youth would meet diagnostic criteria for OCD. Second, we sought to examine the clinical characteristics of depressed youth with OCD relative to youth who are depressed and depressed youth with anxiety disorders. We predicted, based on earlier studies (Peris et al., 2017; Storch et al., 2012), that youth with depression with secondary OCD will endorse higher levels of depressive symptoms than those who present with depression alone, and similar levels to those with a comorbid anxiety disorder. Third, we sought to examine occurrences of suicidality amongst youth with comorbid OCD and depression, compared to youth with depression and comorbid anxiety disorders and depression alone. We predicted that youth who report comorbid OCD and depression will report higher rates of suicidality than their peers with depression alone or depression and comorbid anxiety disorders as earlier studies have indicated elevated levels of suicidality in OCD patients, particularly when comorbid with depressive symptoms (Benster et al., 2022; Storch et al., 2015). Lastly, we sought to examine levels of functional impairment between groups. We predicted that, as in earlier studies (Melton et al., 2016; Storch et al., 2012), individuals who have comorbid OCD and depression, or anxiety and depression, will report higher levels of impairment relative to peers with depression alone.

Methods

Study design and participants

The Texas Youth Depression and Suicide Research Network (TX-YDSRN; <https://tx-ydsrn.swmed.org/>) is an ongoing 12-site initiative across Texas that was launched in 2020. TX-YDSRN is one component of the Texas Child Mental Health Care Consortium (TCMHCC), which funded by the Texas legislature in 2019 for the purpose of developing state-wide collaborations among Texas health-related universities to address serious mental health issues and improve mental health care for children and adolescents. Through TX-YDSRN, we established a registry of participants (aged 8-20 years) who screen positive for depression and/or suicidality on validated measures or who are in treatment for depression. In addition to the depression threshold, participants must be able to read, write, and speak English or Spanish sufficiently to understand the study procedures and provide written informed consent or assent. Exclusion criteria included medical or psychological conditions that make participation unsafe or impair participant ability to complete study requirements, experiencing psychosis or related symptoms, or being unable to provide assent if the participant is under the age of 18 years old. Parents of participants under the age of 18 provided consent, and youth under the age of 18 provided assent. Any participant between the ages of 18 and 20 provided direct consent prior to study enrollment.

Initially, participants and their parents or guardians completed a baseline assessment visit that consisted of a battery of clinician-administered, parent-report (for minors), and self-report measures related to mood, suicidal ideation and behavior, other presenting mental

health diagnoses, and experiences with treatment. Participants were then scheduled for a follow up visit one month out from their initial baseline, then by regular assessment visits that occur once every two months over the span of two years. The present study utilizes data collected from the baseline visit of participants.

Participants

Out of the first 1,000 participants enrolled in the registry, $n = 797$ had a primary depression diagnosis as assessed with the MINI-KID diagnostic interview and were included in the current analysis. The sample was mostly female (73.2%), white (66.3%), and had a mean age of 15.5 years. Fifty participants were between 8-11 years of age, 566 were between 12-17 years of age, and 181 were 18-20 years old. Approximately 43% of the participants were Hispanic.

Measures

Mini-International Neuropsychiatric Interview for Children and Adolescents (MINI-KID; Sheehan et al., 2010).—The MINI-KID is a short, structured diagnostic interview for (DSM-5) psychiatric disorders in children and adolescents and includes an accompanying parent version. The MINI-KID was used to achieve a best estimate rating of diagnoses. Psychometrics among children and adolescents have been established (Duncan et al., 2018; Hogberg et al., 2019). For this study, the MINI-KID was also utilized for participants aged 18-20, though these participants did not have the accompanying parent version and the best estimate was based on the participant version only. The MINI-KID was used to create the three comparison groups for the present study. These groups consisted of participants with only depressive symptoms (Dep Alone), those with depressive symptoms and an anxiety disorder (e.g., Generalized Anxiety, Separation Anxiety, Social Anxiety), referred to as Dep & Anxiety and those with combined depression and OCD (Dep & OCD). Participants included in the Dep & Anxiety group did not have a comorbid diagnosis of OCD, however, if a participant had a comorbid OCD and anxiety disorder in addition to their depressive symptoms, they were included in the Dep & OCD group only.

Screen for Child Anxiety Related Emotional Disorders.—The Screen for Child Anxiety Related Emotional Disorders (SCARED; Birmaher et al., 1999) is a 41-item self-report measure rated on a 3-point Likert scale (0 = Not True or Hardly Ever True to 2 = Very True or Often True) that assesses a child's recent anxiety symptoms. The measure examines five subscales: generalized anxiety, separation anxiety, social phobia, panic/somatic, and school phobia. The SCARED has strong psychometric properties, including good test-retest reliability, internal consistency, and discriminant and convergent validity (Birmaher et al., 1997, 1999).

Patient-Reported Outcomes Measurement Information System 25-item.—The Patient-Reported Outcomes Measurement Information System 25-item (PROMIS-25; Bevens et al., 2017) is a validated questionnaire measuring six health-related quality of life domains: physical function mobility, anxiety, depression, fatigue, peer relationships, and pain interference; each domain contains four questions rated on a 5-point Likert scale

(Physical Function Mobility: 0= With No Trouble to 4 = Not Able to Do; All other scales: 0 = Never to 4 = Almost Always). All items have a 7-day recall period.

Generalized Anxiety Disorder-7.—The Generalized Anxiety Disorder-7 (GAD-7; Spitzer et al., 2006) is a 7-item self-report scale that measures the severity of worry and anxiety symptoms over the past two weeks (e.g., feeling nervous, anxious, or on edge and worrying too much about different things). Items are rated on a 4-point Likert-type scale (0 = Not at all to 3 = Nearly every day). The GAD-7 has demonstrated good psychometric properties, including good internal consistency, convergent validity, and sensitivity and specificity for diagnosing GAD (Spitzer et al., 2006).

Patient Health Questionnaire-9.—The Patient Health Questionnaire-9 (PHQ-9; Choo et al., 2001) is a 9-item self-administered diagnostic tool used to measure the severity of depression symptoms over the past two weeks (e.g., feeling down, depressed, irritable, or hopeless and little interest or pleasure in doing things). Items are rated on a 4-point Likert-type scale (0 = Not at all to 3 = Nearly every day). The PHQ-9 has demonstrated excellent psychometric properties, with excellent test-retest reliability, internal consistency, and criterion, construct, and external validity (Choo et al., 2001).

Concise Health Risk Tracking Self-Report.—The Concise Health Risk Tracking Self-Report (CHRT-SR; Mayes et al., 2018) is a 16-item reliable self-report measure that systematically examines the severity of suicidal thoughts and associated factors that may indicate the propensity for suicidal acts. Items are rated on a 5-point Likert-type scale (0 = Strongly Disagree to 4 = Strongly Agree). All items are rated based off the past week. The CHRT-SR has demonstrated good-to-excellent internal consistency and has been validated for assessing severity of suicidal thoughts and associated risk factors among adolescents (Mayes et al., 2018).

Concise Associated Symptoms Tracking Scale Self-Report.—The Concise Associated Symptoms Tracking Scale Self-Report is a (CAST-SR; Trivedi et al., 2011) is a 17-item questionnaire measuring five factors: mania, irritability, anxiety, panic, and insomnia. Items are rated on a 5-point Likert-type scale (0 = Strongly Disagree to 4 = Strongly Agree). All items are rated based off the extent to which describes how one has been feeling or acting in the past 24 hours. The CAST-SR has demonstrated an appropriate level of reliability and validity (Trivedi et al., 2011).

Connor-Davidson Resilience Scale.—The Connor-Davidson Resilience Scale (CD-RISC; Campbell-Sills & Stein, 2007) is a 10-item self-report questionnaire assessing resilience over the last month. Items are rated on a 5-point Likert-type scale (0 = Not true at all to 4 = True nearly all the time). The CD-RISC has demonstrated excellent psychometric properties, with good reliability and validity, including favorable internal consistency, criterion-related validity, and construct validity (Connor & Davidson, 2003; Campbell-Sills & Stein, 2007).

Social Adjustment Scale–School Module Self-Report.—The Social Adjustment Scale–School Module Self Report (SAS-SR; Weissman et al., 1978, 1999, 2001), part of the

larger, original 54-item scale, is a 6-item questionnaire that measures school functioning and performance in the last 2 weeks. The SAS-SR has demonstrated high external and internal consistency and test-retest reliability (Bosc et al., 1997).

Inventory of Depressive Symptomology Self-Report.—The Inventory of Depressive Symptomology Self-Report (IDS-SR; Rush et al., 1986, 1996) is a 30-item measure used to capture depressive symptom severity in the past seven days. All items are scored on a 4-point scale from 0 to 3. The IDS-SR has demonstrated satisfactory internal validity and concurrent validity (Rush et al., 1986, 1996; Corruble et al., 1999).

Barriers to Treatment Participation Scale.—The Barriers to Treatment Participation Scale (BTPS; Kazdin et al., 1997) is a 44-item measure that assesses perceived barriers to participation in treatment (e.g., scheduling of appointment times for treatment and treatment did not seem necessary). All items are rated on a Likert-type scale. The BTPS has good psychometric properties, with high internal consistency and discriminant and incremental validity (Kazdin et al., 1997).

Youth THRIVE Survey.—The Youth THRIVE Survey (YTS; Browne & Mishraky-Javier, 2021) is a 66-item questionnaire that measures five protective and promotive factors: youth resilience, social connections, knowledge of adolescent development, concrete support in times of need, and cognitive and social-emotional competence. All items are rated on a 4-point Likert-type scale (0 = Not at all like me to 4 = Very much like me). The YTS has demonstrated high levels of internal consistency, reliability, and marginal discriminant validity (Browne & Mishraky-Javier, 2021).

Statistical Analyses

Continuous data were summarized as mean (standard deviation, SD), or median and inter-quartile range (IQR). Continuous outcomes were compared across the three patient groups (Dep Alone, Dep & Anxiety, and Dep & OCD) using one-way analyses of variance (ANOVA) while categorical outcomes were compared using chi-square tests. Standardized differences were reported to assess the magnitude of differences between patient groups. All analyses were done using SAS version 9.4 (SAS Inc., Cary, NC).

Results

Demographics

Of the 797 included participants with primary depression, 124 (15.5%) had a comorbid OCD diagnosis, while 482 (60.5%) had a comorbid anxiety diagnosis. The remaining 191 (24.0%) were diagnosed with depression alone. The three groups of depressed youths were statistically different in terms of age at consent ($p = 0.011$) and sex at birth ($p = 0.002$). Participants with depression alone were slightly older compared to participants with a comorbid anxiety or OCD diagnosis. Higher percentages of participants with a comorbid diagnosis of anxiety or OCD were female compared to participants with depression alone. However, there were no difference in terms of age or sex at birth between participants

with comorbid anxiety or OCD diagnosis. Lastly, the three participant groups were not statistically different in terms of race nor ethnicity (all $p > 0.055$). Details are in Table 1.

Clinical correlates

Clinical characteristics of participants in the three groups are shown in Table 2. Participants with a comorbid diagnosis of anxiety or OCD had higher depression severity (PHQ-9 total score, IDS-SR total score, and PROMIS-25 depression score), anxiety (GAD-7 total score, CAST-SR anxiety score, SCARED anxiety score), irritability (CAST-SR irritability score), insomnia (CAST-SR insomnia score), and lower resilience (CD-RISC total score) compared to participants with depression alone.

Suicidal ideation

Higher proportions of participants with comorbid diagnosis of anxiety or OCD have suicidal ideation (PHQ-9 item 9) as well as higher suicidal propensity and thoughts (CHRT-SR domain scores) compared to participants with depression alone. However, more participants with depression alone have substance abuse problems compared to participants with depression and anxiety. Lastly, participants in the two comorbid diagnosis groups were not statistically different in terms of any clinical characteristics.

Functional impairment

Participants with comorbid anxiety or OCD had higher levels of fatigue (PROMIS-25 fatigue score), and lower physical function (PROMIS-25 physical function score) and peer relationships (PROMIS-25 peer relationship score) compared to participants with depression alone (medium standardized differences). Additionally, participants in these two groups had higher levels of school adjustment problems (SAS-SR school adjustment). However, the two groups with comorbid diagnosis were not different from each other, indicating small, standardized differences.

Discussion

The present study examined clinical characteristics of depression, with and without comorbid OCD and anxiety disorders, amongst youth and young adults across 12 academic medical sites. Participants with comorbid conditions presented with more severe clinical characteristics than their peers with depression alone, and generally did not differ from each other. Depressed youth and young adults who reported comorbid anxiety or OCD also tended to have higher levels of fatigue, lower levels of physical functioning, and lower quality peer relationships in comparison to their peers with a depression diagnosis alone. Depressed youth and young adults with comorbid anxiety or OCD also reported greater difficulty with school adjustment relative to depressed youth alone.

Based on past studies (Millet et al., 2004; Ricklet et al., 2016), we predicted that approximately 20% of depressed youth would meet diagnostic criteria for OCD. Relatively consistent with our initial hypothesis and others (Millet et al., 2004; Ricklet et al., 2016), approximately 15% of depressed youth presented with OCD. More participants met criteria for depression alone ($n = 191$) than depression and comorbid OCD ($n = 124$), however, most

participants met criteria for depression and comorbid anxiety disorders ($n = 482$). This is in line with earlier studies demonstrating the high levels of comorbidity between anxiety and mood disorders in children and adolescents (Axelson & Birmaher, 2001; Biederman et al., 1995; Cummings et al., 2014; Essau, 2008; Melton et al., 2016). Findings highlight the importance of systematically assessing OCD (and anxiety) among depressed youth.

For our second aim, we sought to examine the clinical characteristics of depressed youth and young adults with OCD relative to those with depression alone and depression with comorbid anxiety disorders. Overall, participants with a comorbid diagnosis of anxiety or OCD had higher depressive symptom severity. Findings did not differ as a function of age. Given that previous studies have demonstrated that more severe presentations of depression may result in higher presentation of OCD symptoms (Peris et al., 2010), the clinical implications of these findings suggest a continued need for the assessment and monitoring of youth with comorbid depressive disorders and OCD. Further, the presence of a comorbid anxiety disorder and/or OCD is known to be predictive of poorer treatment response in youth with depression (Curry et al., 2006; Wilkinson et al., 2009). Clinicians should consider the potential impact of all comorbidities when considering treatment options for adolescent depression, as current clinical practice guidelines advise that comorbid disorders may require a separate treatment plan (Walter et al., 2022). However, transdiagnostic treatments that address the underlying vulnerabilities across these highly comorbid disorders, such as avoidance behavior or repetitive negative thinking, may also be efficacious but have been minimally tested in youth with OCD (Ehrenreich-May et al., 2017; Weersing et al., 2012). Furthermore, the temporal relationship of symptom onset between OCD, anxiety disorders, and depressive symptoms should be further explored. Data are inconsistent with some studies suggesting that comorbid depression arises due to the burden and impairment caused by OCD (or anxiety) (Rickelt et al., 2016; Zandberg et al., 2015), while other data suggest that underlying risk factors (e.g., rumination, behavioral avoidance; Wahl et al., 2011) may contribute to onset of both conditions (Olatunji et al., 2013). Given the single timepoint nature of this study, we were unable to explore directionality of symptom onset and/or change. The role of age in these relationships is also unclear. Although the pattern of findings did not change as a function of age, our cohort of younger children was modest and all were recruited based on their significant depressive symptoms. It is conceivable that the pattern of relations between OCD/anxiety and depression may differ as a function of age; we would hypothesize that the associations with depression and suicide would strengthen with increasing age throughout adolescence.

The third aim of this paper was to examine the rates of suicidality amongst youth with comorbid OCD and depressive disorders compared to those in youth and young adults with comorbid anxiety and with depression alone. As seen in Table 2, participants with depression and comorbid OCD and anxiety disorders tended to have higher rates of suicidal ideation than their peers with depression alone as well as higher suicidal propensity and thoughts than their peers with depression alone. The added burden of comorbid symptoms and the higher levels of impairment associated with comorbidity may contribute to greater distress, hopelessness, and eventually suicidal ideation. The elevated prevalence of suicidal ideation and associated risk is of particular concern, considering that suicide is the third leading cause of death among US teenagers (Centers for Disease Control and Prevention,

2010). Understanding predictors and moderators of suicidality in youth with OCD, and how this compares/contrasts with prior results (Glenn & Nock, 2014; Hellberg et al., 2022; Pellegrini et al., 2020) is an important next step of this research.

Lastly, we sought to examine levels of impairment across all groups to determine the presence of differences in quality of life in depressed youth with OCD relative to those with depression alone or depression and a comorbid anxiety disorder. Our findings demonstrate that depressed youth and young adults with comorbid OCD and anxiety disorders tend to report significantly greater impact on functioning and impairment than their peers with depression alone. These findings are consistent with previous studies demonstrating the association of comorbid anxiety disorders and OCD with more significant levels of impairment in youth with depression (Huppert et al., 2009; Avenevoli et al., 2015). Comorbidity amongst this population may be best conceptualized as a reflection of more severe underlying internalizing psychopathology. In other words, separate comorbid diagnoses could be primarily indicative of common vulnerabilities, such as those targeted in transdiagnostic treatment formats for emotional disorders (Ehrenreich-May et al., 2017; Weersing et al., 2012). Clinicians should also personalize treatment plans to ensure that both symptom severity and functional impairment are actively targeted.

There are several study limitations. First, the overarching study assessment battery were not designed to comprehensively assess OCD using a gold standard instrument like the Children's Yale-Brown Obsessive-Compulsive Scale (Goodman et al., 1989a; 1989b). It is possible that the prevalence of comorbid OCD is underestimated in the current data as OCD specific measures were not administered. Future studies seeking to examine secondary OCD diagnoses amongst youth and young adults with depression should incorporate more OCD specific measures to ensure accurate representation of OCD populations. Second, some of the measures used in our study were not validated on older (i.e., SCARED) or younger (i.e., 8 year-olds; PHQ9, GAD7) youth. Third, data presented in our study reflected a single timepoint. Additional time points may provide useful insight into the presentation and trajectory of such comorbidities amongst youth and young adults. Fourth, the single time point nature of this study prevented us from examining directional models. Finally, youth in the OCD group could have had a comorbid anxiety disorder; this group overlap may have influenced results. Within these limitations, our study demonstrates high levels of comorbid anxiety disorders and OCD in youth with depression. Finally, the sample was predominantly recruited from specialty mental health care clinics, which may decrease generalizability of the sample, given that they may represent more severe cases of depression.

The findings demonstrate that depressed youth and young adults with comorbid OCD or anxiety disorders – who do not differ from one another - demonstrate greater levels of depression and suicidality than their peers with depression alone. Furthermore, individuals with comorbid depression and OCD or anxiety disorders are more likely to experience and report greater impairment in the areas of social relationships, school-readiness, fatigue, and overall functioning. As such, it is important for clinicians to evaluate presence of anxiety and OCD symptoms in depressed youth, as these comorbid conditions may exacerbate the impact and course of illness.

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Highlights

- Depressed youth with comorbid obsessive-compulsive disorder demonstrate higher levels of suicidality and overall impairment.
- Rates of anxiety and obsessive-compulsive disorder amongst depressed youth are fairly high compared to depression alone.
- Increased impairment of comorbid anxiety-related disorders in depressed youth indicates a need to enhance psychological treatment approaches.

Table 1.

Demographics

Variable	Total*	Depression & Anxiety**	Depression & OCD***	Depression Alone****	p-value	Standardized Differences		
	n = 797	n = 482	n = 124	n = 191		Dep Alone vs. Dep & Anx	Dep Alone vs. Dep & OCD	Dep & Anx vs. Dep & OCD
Age at Consent, years, mean (sd)	15.5 (2.6)	15.2 (2.5)	15.7 (2.8)	15.9 (2.6)	0.011	0.24	0.07	0.16
Sex at Birth, n (%)					0.002	0.28	0.31	0.04
Male	214 (26.8)	116 (24.1)	28 (22.6)	70 (36.6)				
Female	583 (73.2)	366 (75.9)	96 (77.4)	121 (63.4)				
Race, n (%)					0.055	--	--	--
African American	83 (10.4)	41 (8.5)	12 (9.7)	30 (15.7)				
White	528 (66.3)	324 (67.2)	76 (61.3)	128 (67.0)				
More than one race	88 (11.0)	56 (11.6)	20 (16.1)	12 (6.3)				
Other	84 (10.5)	53 (11.0)	14 (11.3)	17 (8.9)				
Unknown	14 (1.8)	8 (1.7)	2 (1.6)	4 (2.1)				
Ethnicity, n (%)					0.325	--	--	--
Hispanic	340 (42.7)	198 (41.1)	58 (46.8)	84 (44.0)				
Non-Hispanic	443 (55.6)	278 (57.7)	64 (51.6)	101 (52.9)				
Unknown	14 (1.8)	6 (1.2)	2 (1.6)	6 (3.1)				
Gender, n (%)					0.001	--	--	--
Female	485 (60.9)	302 (62.7)	78 (62.9)	105 (55.0)				
Male	206 (25.9)	112 (23.2)	28 (22.6)	66 (34.5)				
Transgender Female	3 (0.4)	1 (0.2)	0 (0.0)	2 (1.1)				
Transgender Male	29 (3.6)	17 (58.6)	9 (7.3)	3 (1.6)				
Non-Binary	48 (6.0)	31 (6.4)	7 (5.6)	10 (5.2)				
Not Sure	17 (2.1)	12 (2.5)	0 (0.0)	5 (2.6)				
Other	7 (0.9)	7 (1.5)	0 (0.0)	0 (0.0)				
Decline to State	2 (0.2)	0 (0.0)	2 (1.6)	0 (0.0)				
In School, n (%)					0.001	0.27	0.33	0.06
No	78 (9.8)	38 (7.9)	8 (6.4)	32 (16.7)				
Yes	719 (90.2)	444 (92.1)	116 (93.6)	159 (83.3)				

Variable	Total* n = 797	Depression & Anxiety** n = 482	Depression & OCD*** n = 124	Depression Alone**** n = 191	p-value	Standardized Differences		
						Dep Alone vs. Dep & Anx	Dep Alone vs. Dep & OCD	Dep & Anx vs. Dep & OCD
Grade, n (%) [*]					0.052	--	--	--
Up to Middle School	326 (45.3)	197 (44.4)	58 (50.0)	71 (44.6)				
High School	334 (46.5)	217 (48.9)	42 (36.2)	75 (47.2)				
College	59 (8.2)	30 (6.8)	16 (13.8)	13 (8.2)				

* Total Sample: Grade n = 719,

** Depression + Anxiety: Grade n = 444,

*** Depression + OCD: Grade n = 116

**** Depression Alone: Grade n = 159

Table 2.

Clinical characteristics

Variable	Total* n = 797	Depression & Anxiety*** n = 482	Depression & OCD*** n = 124	Depression Alone**** n = 191	p-value	Standardized Differences****		
						Dep Alone vs. Dep & Anx	Dep Alone vs. Dep & OCD	Dep & Anx vs. Dep & OCD
CHRT-SR, mean (sd)								
Propensity	16.0 (8.5)	16.8 (8.1)	17.5 (8.9)	12.9 (8.4)	<0.0001	0.47	0.53	0.08
Suicidal Thoughts	2.7 (2.9)	2.9 (3.0)	3.3 (3.2)	2.0 (2.5)	0.000	0.30	0.43	0.13
Impulsivity	4.9 (2.4)	5.1 (2.4)	5.3 (2.3)	4.4 (2.4)	0.001	0.27	0.38	0.11
Total	28.5 (12.8)	29.8 (12.1)	31.3 (13.5)	23.4 (12.6)	<0.0001	0.51	0.60	0.12
PHQ9 Total Score, mean (sd)	12.9 (6.3)	13.6 (6.0)	15.0 (6.5)	9.8 (5.8)		0.64	0.85	0.23
Depression Severity, n (%)					<0.0001	--	--	--
None (PHQ: 0-4)	79 (9.9)	31 (6.4)	7 (5.6)	41 (21.5)				
Mild (PHQ: 5-9)	170 (21.3)	96 (19.9)	17 (13.7)	57 (29.8)				
Moderate (PHQ: 10-14)	228 (28.6)	140 (29.0)	35 (28.2)	53 (27.7)				
Moderately Severe (15-19)	186 (23.3)	128 (26.6)	29 (23.4)	29 (15.2)				
Severe (20+)	134 (16.8)	87 (18.1)	36 (29.0)	11 (5.8)				
GAD7 Total Score, mean (sd)	11.2 (5.8)	12.3 (5.4)	13.0 (5.3)	7.5 (5.3)	<0.0001	0.89	1.05	0.14
Anxiety Severity, n (%)					<0.0001	--	--	--
None (GAD: 0-4)	106 (13.3)	39 (8.1)	4 (3.2)	63 (33.0)				
Mild (GAD: 5-9)	217 (27.2)	120 (24.9)	29 (23.4)	68 (35.6)				
Moderate (GAD: 10-14)	224 (28.1)	147 (30.5)	37 (29.8)	40 (20.9)				
Severe (GAD: 15+)	250 (31.4)	176 (36.5)	54 (43.6)	20 (10.5)				
IDS-SR Total Score, mean (sd)*	32.9 (13.5)	34.8 (12.6)	38.1 (13.4)	25.0 (12.5)	<0.0001	0.79	1.01	0.25
CD-RISC Total Score, mean (sd)*	18.9 (7.7)	17.8 (7.3)	18.8 (8.3)	21.5 (7.8)	<0.0001	0.49	0.33	0.13
PHQ9 Suicidal Ideation					<0.0001	0.41	0.51	0.10
N	449 (56.7)	253 (52.8)	59 (48.0)	137 (72.1)				
Y	343 (43.3)	226 (47.2)	64 (52.0)	53 (27.9)				

Variable	Total* n = 797	Depression & Anxiety*** n = 482	Depression & OCD*** n = 124	Depression Alone**** n = 191	p-value	Standardized Differences*****		
						Dep Alone vs. Dep & Anx	Dep Alone vs. Dep & OCD	Dep & Anx vs. Dep & OCD
Substance Use, n (%)					0.011	0.25	0.12	0.13
N	613 (76.9)	387 (80.3)	93 (75.0)	133 (69.6)				
Y	184 (23.1)	95 (19.7)	31 (25.0)	58 (30.4)				
Exposure to Trauma, n (%)					0.339	0.25	0.12	0.13
N	290 (36.4)	179 (37.1)	38 (30.6)	73 (38.2)				
Y	507 (63.6)	303 (62.9)	86 (63.4)	118 (61.8)				
Comorbid Medical Problems					0.334	0.12	0.20	0.08
N	396 (65.3)	249 (64.7)	53 (60.9)	94 (70.1)				
Y	210 (34.7)	136 (35.3)	34 (39.1)	40 (29.9)				
Unknown								
CAST-SR, mean (sd)*								
Irritability	15.3 (4.7)	15.9 (4.4)	16.4 (4.7)	13.0 (4.6)	<0.0001	0.65	0.74	0.11
Anxiety	9.7 (3.2)	10.1 (3.0)	10.6 (2.7)	7.9 (3.2)	<0.0001	0.72	0.90	0.15
Insomnia	6.0 (2.4)	6.2 (2.4)	6.4 (2.4)	5.2 (2.4)	<0.0001	0.39	0.48	0.09
Panic	4.4 (2.1)	4.6 (2.1)	4.9 (2.2)	3.5 (1.6)	<0.0001	0.61	0.71	0.10
Mania	10.8 (7.0)	10.6 (3.6)	10.7 (3.6)	11.4 (3.4)	0.032	0.23	0.22	0.01
PROMIS, mean (sd)								
Depression	12.7 (4.8)	13.5 (4.6)	14.0 (4.4)	10.2 (4.6)	<0.0001	0.71	0.83	0.12
Anxiety	12.4 (4.5)	13.4 (4.2)	13.8 (4.3)	8.9 (3.8)	<0.0001	1.12	1.20	0.10
Fatigue	13.1 (4.9)	13.8 (4.7)	14.2 (4.3)	10.9 (5.0)	<0.0001	0.60	0.71	0.09
Function/Mobility	17.4 (3.2)	17.0 (3.2)	17.0 (3.5)	18.6 (2.5)	<0.0001	0.55	0.52	0.01
Pain Interference	9.2 (4.9)	9.7 (4.9)	9.9 (5.3)	7.6 (4.3)	<0.0001	0.45	0.47	0.04
Pain Severity	3.2 (2.6)	3.3 (2.6)	3.6 (2.9)	2.5 (2.3)	0.000	0.34	0.42	0.10
Peer Relationships	13.0 (4.2)	12.5 (4.0)	13.3 (4.2)	14.3 (4.4)	<0.0001	0.42	0.24	0.18
Sleep	13.0 (4.1)	12.8 (4.0)	14.0 (3.8)	12.6 (4.3)	0.259	0.05	0.33	0.29
Social Activities	13.3 (4.0)	12.2 (3.7)	12.9 (3.7)	15.3 (3.9)	<0.0001	0.81	0.63	0.19

Variable	Total* n = 797	Depression & Anxiety** n = 482	Depression & OCD*** n = 124	Depression Alone**** n = 191	p-value	Standardized Differences*****		
						Dep Alone vs. Dep & Anx	Dep Alone vs. Dep & OCD	Dep & Anx vs. Dep & OCD
SCARED, mean (sd)*								
Anxiety Disorder	39.7 (18.4)	43.9 (16.7)	45.5 (19.0)	26.0 (14.9)	<0.0001	1.13	1.14	0.09
Panic Disorder	10.8 (7.0)	11.9 (6.6)	13.3 (7.2)	6.4 (5.7)	<0.0001	0.90	1.07	0.20
Generalized Anxiety Disorder	11.3 (5.0)	12.4 (4.3)	12.6 (5.0)	7.6 (4.7)	<0.0001	1.07	1.03	0.04
Separation Anxiety Disorder	5.3 (4.1)	5.8 (4.1)	6.6 (4.4)	3.3 (3.2)	<0.0001	0.68	0.87	0.19
Social Phobic Disorder	8.7 (4.2)	9.6 (3.9)	8.7 (4.1)	6.5 (4.0)	<0.0001	0.79	0.56	0.21
Significant School Avoidance Symptoms	3.7 (2.6)	4.1 (2.5)	4.2 (2.8)	2.3 (2.0)	<0.0001	0.83	0.82	0.04
SAS-SR School Adjustment	2.4 (0.8)	2.5 (0.8)	2.5 (0.8)	2.1 (0.8)	<0.0001	0.54	0.51	0.00
BTPS Domains								
Stressors and Obstacles	26.5 (7.3)	27.1 (7.7)	25.1 (5.4)	25.7 (7.2)	0.027	0.19	0.08	0.29
Perceived Relevance	13.4 (4.2)	13.7 (4.3)	12.7 (3.3)	12.8 (4.3)	0.024	0.21	0.03	0.27
Therapist Relationships	8.3 (3.0)	8.5 (3.2)	7.7 (2.3)	8.0 (2.9)	0.023	0.18	0.12	0.31
BTPS Total	61.0 (15.0)	62.5 (15.6)	57.6 (11.2)	59.0 (15.1)	0.004	0.23	0.11	0.36
Youth THRIVE Domains								
Resilience	27.7 (6.7)	26.8 (6.5)	27.7 (6.7)	30.0 (6.7)	<0.0001	0.49	0.35	0.14
Connections	60.7 (14.0)	59.7 (13.9)	61.6 (14.3)	62.5 (13.8)	0.044	0.21	0.07	0.14
Development	48.4 (8.9)	47.5 (8.9)	49.6 (9.2)	49.6 (8.5)	0.007	0.24	0.00	0.23
Support	35.7 (9.1)	34.9 (9.1)	35.8 (9.5)	37.5 (8.7)	0.004	0.29	0.19	0.10
Competence	55.5 (9.7)	54.9 (9.5)	55.8 (10.3)	56.9 (9.5)	0.061	0.20	0.10	0.09
Number of Services Used	5.9 (2.1)	6.1 (2.1)	6.1 (1.9)	5.5 (2.2)	0.012	0.24	0.25	0.00

* Total Sample: PHQ Suicidal Ideation n = 792, Comorbid Medical Problems n = 606, IDS-SR n = 749, CD-RISC n = 775, CAST-SR n = 760, SCARED n = 776, PROMIS n = 768, PROMIS Peer Relationships n = 590, PROMIS Sleep n = 178, PROMIS Social n = 178, BTPS n = 603, YRS n = 770

** Depression and Anxiety: PHQ Suicidal Ideation n = 479, Comorbid Medical Problems n = 385, IDS-SR n = 446, CD-RISC n = 466, CAST-SR n = 457, SCARED n = 467, PROMIS n = 462, PROMIS Peer Relationships n = 375, PROMIS Sleep n = 87, PROMIS Social n = 87, SAS-SR n = 348, BTPS n = 384, YRS n = 462

*** Depression and OCD: PHQ Suicidal Ideation n = 123, Comorbid Medical Problems n = 87, IDS-SR n = 117, CD-RISC n = 119, CAST-SR n = 118, SCARED n = 119, PROMIS n = 116, PROMIS Peer Relationships n = 80, PROMIS Sleep n = 36, PROMIS Social n = 36, BTPS n = 87, YRS n = 118

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Depression Alone: PHQ Suicidal Ideation n = 190, Comorbid Medical Problems n = 134, IDS-SR n = 186, CD-RISC n = 190, CAST-SR n = 185, SCARED n = 190, PROMIS Peer Relationships n = 135, PROMIS Sleep n = 55, PROMIS Social n = 55, BTPS n = 132, YRS n = 190

The pattern of findings remained the same when age was covaried.

Table 3.

Primary diagnoses of individuals with depression and anxiety, depression and obsessive-compulsive disorder, and depression alone

Variable	Total*		Depression & Anxiety**		Depression & OCD***		Depression Alone****	
	n = 797		n = 482		n = 124		n = 191	
Major Depressive Disorder								
Current	183	23.0%	122	25.3%	28	22.6%	33	17.3%
Past	94	11.8%	48	9.9%	6	4.8%	40	20.9%
Recurrent	332	41.7%	197	40.9%	49	39.5%	86	45.0%
Persistent Depressive Disorder (Current)	120	15.1%	78	16.2%	27	21.8%	15	7.9%
Major Depressive Disorder with Psychotic Features (Current)	46	5.8%	27	5.6%	13	10.5%	6	3.1%
Major Depressive Disorder with Psychotic Features (Past)	22	2.8%	10	2.1%	1	0.8%	11	5.8%
Age of Onset of MDE, years, mean (sd)			11.2	2.9	10.9	3.3	11.7	3.0
Length of Current Episode, weeks, median (IQR)			50 (50.0, 10.8)		52 (7.0, 2.4)		13 (0.0, 66.0)	
Number of Lifetime MDEs, median (IQR)			2.0 (1.0, 3.0)		52 (7.0, 2.4)		13 (0.0, 66.0)	
Number of Lifetime Suicide Attempts, median (IQR)			2.0 (1.0, 3.0)		52 (7.0, 2.4)		13 (0.0, 66.0)	
Number of Lifetime Suicide Attempts, median (IQR)			0.0 (0.0, 1.0)		0.0 (0.0, 1.0)		0.0 (0.0, 1.0)	
Number of Lifetime Suicide Attempts, n (%)								
0	415	52.1%	245	50.8%	67	54.0%	103	53.9%
1	231	29.0%	135	28.0%	36	29.0%	60	31.4%
2	62	7.8%	41	8.5%	7	5.6%	14	7.3%
3	42	5.3%	31	6.4%	7	5.6%	4	2.1%
4	17	2.1%	10	2.1%	3	2.4%	4	2.1%
5+	26	3.3%	16	3.3%	4	3.2%	6	3.1%
Unknown	4	0.5%	4	0.8%	0	0.0%	0	0.0%
Number of Lifetime MDEs, n (%)								
0	3	0.4%	0	0.0%	2	1.6%	1	0.5%
1	336	42.2%	214	44.2%	54	43.5%	68	35.6%
2	149	18.7%	87	18.0%	24	19.4%	38	19.9%
3	98	12.3%	60	12.4%	13	10.5%	25	13.1%
4	57	7.2%	30	6.2%	9	7.3%	18	9.4%
5+	123	15.4%	75	15.5%	18	14.5%	30	15.7%
Unknown	31	3.9%	16	3.3%	4	3.2%	11	5.8%