

Self-harm and suicidality in young people with obsessive-compulsive and related disorders and chronic tic disorders

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Abstract

Suicidality is a serious concern in obsessive-compulsive and related disorders (OCRDs) and chronic tic disorders. Yet comparisons across these diagnoses are limited and little is known about changes in suicidality following treatment. We examined the risks of self-harm, suicidal ideation, and suicide attempts in adolescents with obsessive-compulsive disorder (OCD; $n = 558$, 79.8%), body dysmorphic disorder (BDD; $n = 66$, 9.4%), body-focused repetitive behaviors disorders (BFRBs; $n = 30$, 4.3%), and Tourette syndrome/chronic tic disorder (TS/CTD; $n = 45$, 6.4%) attending a specialist clinic. Groups were compared at baseline using multivariable logistic regression models. Additionally, changes in self-harm and suicidal ideation after multimodal treatment were explored using generalized logistic mixed-effects models. Self-harm or suicidality were common (33.3% in TS/CTD, 55.0% in OCD, 63.3% in BFRBs, and 75.8% in BDD). Youth with BDD (vs. OCD) had doubled odds of lifetime self-harm and current and lifetime suicidal ideation, and fivefold greater odds of previous suicide attempts. The self-harm and suicidality risk in BFRBs was largely similar to that in OCD, while youth with TS/CTD had half the odds of lifetime suicidal ideation compared with OCD. In OCD and BDD, the odds of current self-harm or suicidal ideation were 60% lower after treatment. Outcomes for the BFRB and TS/CTD groups were not calculated owing to small numbers. Self-harm and suicidality are common in OCRD and tic disorders, with prevalence rates varying across conditions, and BDD representing a particularly high-risk group. Although self-harm and suicidal ideation may improve with treatment, ongoing suicide risk assessment may be warranted in adolescents with OCRDs.

INTRODUCTION

Suicidality, a broad clinical term used to describe thoughts, feelings, and behaviors related to suicide [1], is recognized as a significant concern in obsessive-compulsive related disorders (OCRDs), including obsessive-compulsive disorder (OCD) [2, 3], body dysmorphic disorder (BDD) [4, 5], trichotillomania (hair-pulling disorder) and excoriation (skin-picking) disorder [6], as well as in other closely related conditions, such as Tourette's syndrome and chronic tic disorders (TS/CTD) [7, 8]. These disorders are all relatively prevalent and typically emerge in childhood or adolescence [9–12], yet suicidality during this critical developmental stage has received little empirical attention.

Self-harm has been shown to be a key predictor of suicide [13], yet few studies have investigated self-harm in OCD. In one study of 269 adolescents and adults with OCD, 7.4% reported a lifetime history of self-harm [14]. In BDD, self-harm is reported more often, with around 50% presenting with a lifetime history of self-harm in both adults and youth [e.g., 11,15]. In a study with 280 adults with BFRBs, half of the sample reported a lifetime history of self-harm, unrelated to their repetitive behaviors [16]. Further, a review of 20 cohorts of both young people and adults with tic disorders (total $N = 7,261$; mean age = 22) reported a lifetime history of self-harm in 35% of the participants [17].

In adult samples, the point and lifetime prevalence rates for suicidal ideation are estimated around 30% and 50%, respectively, in OCD [2, 18], compared with around 40% and 65%, respectively, in BDD [6]. Studies focusing on youth samples with BDD have shown similar rates of suicidal ideation [11, 19], while studies in

youth with OCD have reported lower rates (13–24%) [20, 21]. Suicidal ideation estimates in body focused repetitive behavior disorders (BFRB; i.e., hair-pulling and skin-picking disorders) and tic disorders are scarcer. In a meta-analysis, the pooled point prevalence of current suicidal ideation in BFRB, based on three adult samples totaling 407 individuals, was 40% [6]. In one study including 75 treatment-seeking young people with tic disorders, 10% reported current suicidal ideation [22].

In large population-based studies, the risk of suicide attempts is reported to be about five times higher in OCD [3], four times higher in BDD [4], three times higher in hair-pulling disorder [23], and four times higher in TS/CTD [7], compared to matched controls. For skin-picking disorder, evidence from large population-based samples is still lacking. However, in a meta-analysis including six adult BFRB samples (total $N = 329$), the pooled prevalence of lifetime suicide attempts in individuals with these disorders was 13.6% [6].

Nonetheless, methodological differences limit direct comparisons across conditions.

Another clinically important but understudied question is to what extent self-harm, suicidal ideation, and other suicidal behaviors are reduced following evidence-based treatment for the target disorder. Previous studies have shown improvements in comorbid psychopathology, including depressive symptoms, for example [24–27], but there is little evidence on the impact of treatment on self-harm and suicidality. The hope is that evidence-based treatment should reduce the risk of both self-harm and suicidality across these disorders.

In this study, we used data from a large clinical cohort of young individuals aged 12 to 17 years with a diagnosis of an OCRDs or TS/CTD from a specialist OCD and related disorders clinic in Sweden. The aims of this study were twofold. First, we aimed to describe the frequency of previous and current self-harm and suicidal ideation, as well as previous suicide attempts, and compare the likelihood of these outcomes across disorders, with OCD as the reference category. Second, for the young people receiving treatment at the clinic, we aimed to examine the extent to which current self-harm and suicidal ideation improved after receiving multimodal treatment for the target disorder, and how common new suicide attempts were over the course of treatment.

METHODS

The Stockholm Regional Ethical Review Board approved the study (reference number 2015/1977-31/4). Informed consent was provided by all participants and their parents/legal guardians.

Participants and procedures

Participants had been referred to the OCD and Related Disorders Clinic for Children and Adolescents in Stockholm, Sweden between November 2019 and February 2026. All participants had a primary diagnosis of OCD, BDD, trichotillomania (hair-pulling disorder) or excoriation (skin-picking) disorder (hair-pulling and excoriation disorders hereafter collectively referred to as BFRBs) or TS/CTD according to the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5). Participants with more than one of the examined disorders were grouped based on the primary diagnosis (i.e., the disorder for which they were primarily referred to the clinic).

Initial assessments consisted of a 3-hour session where participants completed a series of semi-structured clinical interviews administered by experienced clinical psychologists. This included an interview module for OCD and related disorders based on the Structured Clinical Interview for DSM-IV (SCID-I) [28], adapted to align with the DSM-5 criteria, and often the Mini International Neuropsychiatric Interview for Children (MINI-KID) [29]. Assessments were discussed in a multidisciplinary team meeting also including a child and adolescent psychiatrist.

Measures

The following measures were administered at intake. For those participants undergoing treatment at the clinic (see below), the same measures were also administered at post-treatment.

Clinician-rated measures

Clinician-rated semi-structured interviews to assess the severity of the primary disorder were specific to each of the diagnoses. For those whose primary disorder was OCD, the Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS) was employed. The CY-BOCS is a clinician-rated, semi-structured interview which is used to assess the severity of the OCD symptoms [30]. It consists of five severity items for both obsessions and compulsions, with a total OCD severity score ranging from 0 to 40. The CY-BOCS has shown good reliability as well as good convergent and discriminant validity [31].

For those whose primary disorder was BDD, the Yale-Brown Obsessive-Compulsive Scale Modified for BDD – Adolescent version (BDD-YBOCS-A) was employed. The BDD-YBOCS-A is a widely-used 12-item clinician-administered, semi-structured interview that rates BDD symptom severity during the past week [32]. It contains 12 Likert-type items ranging from 0 to 4. The BDD-YBOCS-A has shown excellent interrater and test-retest reliability, high internal consistency, good sensitivity to change, and good convergent and discriminant validity [33].

For individuals with a primary diagnosis of trichotillomania or excoriation disorder, we used two semi-structured clinical interviews: the National Institute of Mental Health Trichotillomania Severity Scale (NIMH-TSS) or the Yale-Brown Obsessive-Compulsive Scale modified for Neurotic Excoriation (NE-Y-BOCS), respectively. The NIMH-TSS [34] scores range from 0 to 24. Its psychometric properties are acceptable for both adults [35] and children [36]. The NIMH-TSS includes an ancillary Trichotillomania Impairment Scale (NIMH-TIS) [34] which consists of one item, with a total score ranging from 0 to 10, reflecting the level of impairment caused by hair-pulling. The NE-Y-BOCS [37] scores range from 0 to 40. The scale has good test-retest reliability and good construct validity [38].

For those with a primary diagnosis of TS/CTD, the Yale Global Tic Severity Scale (YGTSS) [39] was used. The YGTSS is a clinician-rated semi-structured interview which assesses tic severity and tic-related impairment. The interview consists of three parts: a symptom checklist, a tic severity rating, and a tic-related impairment rating. The total score of 0–100 points can be divided into several sub scores, namely the Motor Tic Severity Score (0–25 points), the Vocal Tic Severity Score (0–25 points), the Total Tic Severity

Score (YGTSS-TTSS; the two former scores combined, 0–50 points), and the Impairment Score (0–50 points). The YGTSS has demonstrated good psychometric properties [39, 40].

Suicidality questions

All participants and their parents were asked about past and/or current self-harm, suicidal thoughts, and suicide attempts. The assessment was based on the suicidality items in the MINI-KID [29] (for self-harm: *“Have you intentionally harmed yourself without intending to kill yourself?”*; for suicidal ideation: *“Have you considered killing yourself?”*; and for suicide attempts: *“Have you tried to commit suicide (kill yourself)?”*). Clinicians then coded the answers according to the following options. At baseline: *“has the patient self-harmed (without suicidal intent)?”* (Never / Previously [ever] / Ongoing [last 2 weeks]); *“does the patient have suicidal thoughts?”* (Never / Previously [ever] / Ongoing [last 2 weeks]); *“has the patient ever attempted suicide?”* (No / Yes / Don’t know); and at the end of the treatment: *“has the patient self-harmed (without suicidal intent) during the last two weeks”* (Yes / No), *“has the patient had suicide thoughts during the last two weeks”* (Yes / No), and *“has the patient attempted suicide since the last assessment (i.e., the baseline assessment)”* (Yes / No).

Global impairment and improvement

Clinicians also administered the Clinical Global Impairment (CGI) and the Children’s Global Assessment Scale (CGAS). The CGI – Severity (CGI-S) is a single-item, clinician rating of global symptom severity, in this case focused on the primary diagnosis. Scores range from 1 (‘not ill at all’) to 7 (‘among the most extremely ill’) [41]. The CGI – Improvement (CGI-I) is a single-item, clinician rating of symptom improvement. Improvement scores, in relation to baseline, range from 1 (‘very much improved’) to 7 (‘very much worse’). The CGI-I is not administered at baseline. The CGAS is a single-item, clinician-rated measure of global functioning (ranging from 1 to 100; higher scores indicate better functioning) across all domains. The CGAS is a widely used instrument with good psychometric properties [42].

Self- and parent-reported measures

Self-reported depressive symptoms were assessed with the Short Mood and Feelings Questionnaire, child version (SMFQ-C), a 13-item measure and the 13-item parent-reported version of the SMFQ (SMFQ-P). Both instruments have good psychometric properties [43, 44].

The self-reported Work and Social Adjustment Scale–Youth (WSAS-Y) and Parent (WSAS-P) versions were used to assess functional impairment related to the target disorder in five areas (i.e., school/work, daily situations, social activities, leisure activities, and relationships). The instruments have excellent psychometric properties [45].

Multimodal treatment

The cognitive behavior therapy (CBT) protocols have been described in previous treatment evaluations of OCD [46], BDD [47], and BFRB [26], and TS/CTD [27]. The standard length of the different protocols is 14 sessions for OCD, 20 sessions for BDD, and 8 sessions for BFRBs and TS/CTD. However, as this was a naturalistic setting, the multidisciplinary teams had the possibility to flexibly alter the length and the intensity of the treatment. For all disorders, sessions typically last one hour and are conducted weekly. The protocols include varying degrees of parental/carer involvement, depending on the young person's needs. CBT was delivered by clinical psychologists experienced in the treatment of OCRDs and tic disorders or by clinical psychology trainees under close supervision.

Participants could also receive pharmacological treatment for the target disorder and other comorbid symptoms/disorders, which was prescribed (or modified after the intake assessment and/or during treatment) by child and adolescent psychiatrists at the clinic, according to treatment guidelines and clinical judgement [48, 49].

Statistical analysis

Baseline demographic and clinical characteristics for the four diagnostic groups were presented descriptively using means and standard deviations, for continuous variables, or frequencies and percentages, for categorical variables. Between-group differences across disorders were explored using one-way ANOVAs and Chi-square tests, respectively. When ANOVAs were statistically significant, post-hoc pairwise comparisons were conducted using Tukey's HSD test, and for significant results from the Chi-square tests, pairwise comparisons were conducted using two-sample tests of proportions with Bonferroni correction applied to control for multiple testing.

Further, we examined baseline differences in self-harm and suicidality (i.e., current/lifetime self-harm, current/lifetime suicidal ideation, and lifetime suicide attempts) across diagnostic groups (based on the primary diagnosis) using multivariable logistic regression models with diagnosis as a four-level categorical predictor. OCD, being the largest and better studied group, was specified as the reference category. Crude models were followed by additional models adjusted for a series of covariates, selected a priori based on their established associations with suicidal behavior [50, 51], including age, gender, and baseline disorder severity, as measured with the CGI-S. Moreover, since we observed statistically significantly higher rates of comorbid depression and self-rated depressive symptoms in the BDD versus other groups, we ran a separate model further adjusting for self-rated depression (SMFQ-C).

Change in self-harm and suicidal ideation from baseline to post-treatment following treatment was analyzed in OCD and BDD only given the low numbers of participants reporting these outcomes in the BFRB and TS/CTD groups (fewer than three participants per group). Generalized logistic mixed-effects models with random intercepts for individuals were used, with time (baseline and post-treatment) and diagnosis (OCD and BDD) as fixed effects, with baseline and OCD specified as the reference categories. To explore whether change over time differed by diagnosis, an interaction between time and diagnosis was also examined.

To contextualize self-harm and suicidality outcomes, we also evaluated reductions in symptom severity for the target disorder (e.g., OCD, BDD, BFRB, and tic symptoms). The remaining treatment outcome measures were analyzed through linear mixed models for repeated measures with maximum likelihood estimation of parameters. All models included fixed effects of time and a random intercept for each participant. To address the main treatment effects, we fitted separate models for each of the groups (i.e., OCD, BDD, BFRB, and TS/CTD) including the two time points (baseline and post-treatment).

Alpha levels (two-tailed) were set to $p < 0.05$. All analyses were performed using Stata 19.5 (StataCorp LLC).

RESULTS

Participant characteristics

Participants included 723 young people aged between 12 and 17 years with a main diagnosis of OCD, BDD, BFRB or TS/CTD who were referred to the specialist clinic. Of these, 24 were excluded due to being returning patients (i.e., they had done more than one initial assessment). In case of duplicates, the first assessment was retained. Hence, the final sample consisted of 699 participants. Of these, 558 (79.8%) had a primary diagnosis OCD, 66 (9.4%) had BDD, 30 (4.3%) had BFRB (13 of those had hair-pulling disorder and 17 had skin-picking disorder), and 45 (6.4%) had TS/CTD. A total of 67 (9.6%) had more than one of the target disorders, but were only counted once, based on their primary diagnosis.

As shown in Tables 1 and 2, there were statistically significant baseline differences between individuals in the four groups on most demographic and clinical characteristics, as well as on all the clinical measures.

Table 1

Demographic and clinical characteristics of a sample of young individuals with obsessive-compulsive and related disorders ($N = 699$).

Demographic and clinical characteristics	OCD ($n = 558$)		BDD ($n = 66$)		BFRB ($n = 30$)		TS/CTD ($n = 45$)		Statistics	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F ($df1$, $df2$)	p
Age at assessment	14.7 ^{a,b}	1.7	15.3 ^c	1.2	15.2 ^{a,c}	1.7	14.2 ^b	1.7	5.32 (3, 695)	0.001
	N	%	N	%	N	%	N	%	χ^2	p
Gender									23.32	< 0.001
Girl	356 ^a	63.8	55 ^b	83.3	24 ^{a,b}	80.0	19 ^c	42.2		
Boy	193 ^a	34.6	11 ^b	16.7	5 ^{a,b}	16.7	25 ^c	55.6		
Other	9	1.6	< 3	-	< 3	-	< 3	-		
Any self-harm or suicidality	307 ^a	55.0	50 ^b	75.8	19 ^{a,b,c}	63.3	15 ^c	33.3	20.71	< 0.001
Current self-harm	33 ^a	5.9	9 ^b	13.6	< 3	-	< 3	-	11.60	0.009
History of self-harm	169 ^{a,c}	30.3	39 ^b	59.1	13 ^{a,b}	43.3	6 ^c	13.3	31.67	< 0.001
Current suicide thoughts	75 ^a	13.4	21 ^b	31.8	< 3	-	< 3	-	23.83	< 0.001
History of suicide thoughts	276 ^a	49.5	48 ^b	72.7	18 ^{a,b}	60.0	1 ^c	26.7	24.59	< 0.001
History of suicide attempts	22 ^a	4.0	13 ^b	20.0	3 ^{a,b}	10.7	< 3	-	21.81	< 0.001
Any comorbid mental disorder	332 ^a	57.7	51 ^b	77.3	24 ^{a,b}	80.0	31 ^{a,b}	68.9	15.64	0.001
ADHD	146 ^a	26.6	16 ^a	24.4	14 ^a	46.7	18 ^a	40.0	9.83	0.020
ASD	120 ^a	21.5	6 ^b	7.6	14 ^c	46.7	12 ^{a,c}	26.7	19.48	< 0.001
Anxiety disorders ^a	67 ^a	12.0	12 ^a	18.2	5 ^a	16.7	7 ^a	15.6	2.67	0.446
Depression	59 ^a	10.6	24 ^b	36.4	4 ^a	13.3	< 3	-	38.30	< 0.001

Demographic and clinical characteristics	OCD (n = 558)		BDD (n = 66)		BFRB (n = 30)		TS/CTD (n = 45)		Statistics	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F (df1, df2)	p
OCRD ^b	50 ^a	9.0	5 ^a	7.6	6 ^a	20.0	6 ^a	13.3	5.04	0.169
Eating disorders	32 ^a	5.7	11 ^b	16.7	< 3	-	< 3	-	17.72	0.001
Other comorbidities	26 ^a	4.7	3 ^a	4.6	3 ^a	10.0	6 ^a	13.3	7.43	0.059
On pharmacological treatment at intake	298 ^a	53.4	43 ^{a,b}	65.2	26 ^b	86.7	26 ^a	57.8	15.28	0.002
SSRI	199 ^a	35.7	36 ^b	54.6	17 ^{a,b}	56.7	11 ^a	24.4	16.93	0.001
ADHD medication	67 ^a	12.0	9 ^a	13.6	14 ^b	46.7	17 ^b	37.8	45.11	< 0.001
Antipsychotics	35	6.3	< 3	-	< 3	-	< 3	-	2.66	0.446
Melatonin	137 ^a	24.6	13 ^a	19.7	14 ^b	46.7	15 ^{a,b}	33.3	9.93	0.019
Other medications	95 ^a	17.0	12 ^a	18.2	10 ^a	33.3	4 ^a	8.9	7.68	0.053
Notes: Frequencies less than 3 have been suppressed. Means with different superscripts differ significantly (p < 0.05). Pairwise comparisons for categorical variables are based on χ^2 tests with Bonferroni correction; pairwise comparisons for continuous variables are based on Tukey-adjusted tests following ANOVA. ^a Includes specific phobia, social anxiety disorder, panic disorder or anxiety disorders not otherwise specified, ^b Refers to participants who were diagnosed with more than one of the target diagnoses at baseline. Abbreviations: ADHD, attention deficit-hyperactivity disorder; ASD, autism spectrum disorder; BDD, body dysmorphic disorder; BFRB, body focused repetitive behavior; OCD, obsessive-compulsive disorder; OCDRD, obsessive-compulsive and related disorders; SD, standard deviation; SSRI, selective serotonin reuptake inhibitors; TS/CTD; Tourette syndrome or chronic tic disorder.										

Table 2
Outcome measures in a sample of young individuals with obsessive-compulsive and related disorders and tic disorders ($N = 699$).

Variable (n)	OCD ($n = 558$)		BDD ($n = 66$)		BFRB ($n = 30$)		TS/CTD ($n = 45$)		Statistics	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F (df1, df2)	p
Diagnosis-specific measures										
CY-BOCS (557)	22.8	4.1	-	-	-	-	-	-	-	-
BDD-YBOCS-A (66)	-	-	28.7	4.5	-	-	-	-	-	-
NE-YBOCS (17)	-	-	-	-	19.9	4.7	-	-	-	-
NIMH-TSS (13)	-	-	-	-	14.4	3.9	-	-	-	-
YGTSS (45)	-	-	-	-	-	-	46.6	12.3	-	-
Clinical measures	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F (df1, df2)	p
CGI-S (698)	4.3 ^{a,b}	0.7	4.5 ^b	0.7	4.0 ^a	0.9	4.2 ^{a,b}	0.7	4.60 (3, 694)	0.003
CGAS (699)	51.3 ^a	5.9	50.5 ^a	6.4	52.5 ^a	5.0	56.4 ^b	9.5	10.46 (3, 695)	< 0.001
SMFQ-C (612)	11.0 ^a	6.1	15.2 ^b	6.3	9.5 ^{a,c}	4.9	8.1 ^c	5.4	12.56 (3, 608)	< 0.001
SMFQ-P (649)	10.7 ^a	6.2	13.2 ^b	5.9	7.3 ^c	4.7	7.5 ^c	5.6	9.91 (3, 645)	< 0.001
WSAS-Y (613)	18.5 ^a	8.3	20.0 ^a	5.9	13.0 ^b	9.6	14.0 ^b	8.0	7.48 (3, 609)	< 0.001
WSAS-P (651)	20.6 ^a	8.3	20.9 ^a	7.6	13.6 ^b	9.8	13.8 ^b	8.0	11.67 (3, 647)	< 0.001

Notes: Means with different superscripts differ significantly ($p < 0.05$). Pairwise comparisons for categorical variables are based on χ^2 tests with Bonferroni correction; pairwise comparisons for continuous variables are based on Tukey-adjusted tests following ANOVA.

Variable (n)	OCD		BDD		BFRB		TS/CTD		Statistics	
	(n = 558)		(n = 66)		(n = 30)		(n = 45)			
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F (df1, df2)	p
<i>Abbreviations:</i> BDD, body dysmorphic disorder, BDD-YBOCS-A, The Yale-Brown Obsessive-Compulsive Scale Modified for BDD – Adolescent version; BFRB, body focused repetitive behavior; CDI-S, Children’s Depression Inventory – Short Version; CGAS, Children’s Global Assessment Scale; CGI-S, Clinical Global Impression – Severity; CI, confidence interval; M, mean; CY-BOCS-A, Yale-Brown Obsessive-Compulsive Scale – Children version; NE-Y-BOCS, The Yale-Brown Obsessive Compulsive Scale modified for Neurotic Excoriation; NIMH-TSS, The National Institute of Mental Health – Trichotillomania Severity Scale; OCD, obsessive-compulsive disorder; SD, standard deviation; SMFQ-C, Short Mood and Feelings Questionnaire, Child Version; SMFQ-P, Short Mood and Feelings Questionnaire, Parent Version; TS/CTD, Tourette Syndrome / chronic tic disorder; WSAS-P, Work, Social and Adjustment Scale – Parent Version; WSAS-Y, Work, Social and Adjustment Scale–Youth Version; YGTSS, The Yale Global Tic Severity Scale.										

Baseline self-harm and suicidality across diagnostic groups

Self-harm and suicidal behaviors were relatively frequent across all groups (Table 1), with rates of any of these behaviors ranging from one third of the sample in TS/CTD ($n = 15$, 33.3%) to over three fourths in BDD ($n = 50$, 75.8%).

When comparing the groups (Table 3), logistic regression analyses adjusted for demographics and severity (Model 2) showed that individuals with BDD, compared with those with OCD, had more than twofold increased odds of lifetime self-harm, compared with those with OCD (adjusted OR = 2.5, 95% CI, 1.4–4.2). For current self-harm, the adjusted odds of the BDD group, compared with the OCD group, were higher, although the difference was not statistically significant owing to a wide confidence interval (adjusted OR = 2.0, 95% CI, 0.9–4.4). The odds of lifetime self-harm in the TS/CTD group were lower than those of the OCD group, although the difference was not statistically significant (adjusted OR = 0.4 95% CI, 0.2–1.1). Odds were not significantly different for BFRB, relative to OCD.

Table 3

Logistic regression models for lifetime suicide attempt, lifetime and current suicidal ideation and lifetime and current non-suicidal self-harm. Odds ratios are presented relative to OCD (reference group).

Variable	Model 1	Model 2	Model 3
	Crude	Adjusted for age, gender, and symptom severity (CGI)	Adjusted for variables in Model 2 plus depressive symptoms (SMFQ-C)
	OR (95% CI)	OR (95% CI)	OR (95% CI)
Current self-harm (last 2 weeks)			
OCD	1.0	1.0	1.0
BDD	2.5 (1.1–5.5) *	2.0 (0.9–4.4)	1.4 (0.6–3.5)
Lifetime self-harm			
OCD	1.0	1.0	1.0
BDD	3.3 (2.0–5.6) ***	2.5 (1.4–4.2) **	1.9 (1.0–3.6) *
BFRB	1.8 (0.8–3.7)	1.5 (0.7–3.3)	1.9 (0.8–4.9)
TS/CTD	0.4 (0.1–0.9) *	0.4 (0.2–1.1)	0.7 (0.3–1.9)
Current suicidal ideation (last 2 weeks)			
OCD	1.0	1.0	1.0
BDD	3.0 (1.7–5.3) ***	2.7 (1.5–4.9) **	2.1 (1.1–4.2) *
Lifetime suicidal ideation			
OCD	1.0	1.0	1.0
BDD	2.7 (1.5–4.8) **	2.4 (1.3–4.2) **	2.0 (1.0–3.8) *
BFRB	1.5 (0.7–3.2)	1.7 (0.8–3.7)	2.1 (0.8–3.8)
TS/CTD	0.4 (0.2–0.7) **	0.4 (0.2–0.8) *	0.5 (0.2–1.1)
Lifetime suicide attempt			
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$			

Variable	Model 1	Model 2	Model 3
	Crude	Adjusted for age, gender, and symptom severity (CGI)	Adjusted for variables in Model 2 plus depressive symptoms (SMFQ-C)
	OR (95% CI)	OR (95% CI)	OR (95% CI)
Current self-harm (last 2 weeks)			
OCD	1.0	1.0	1.0
BDD	5.9 (2.8–12.5) ***	4.8 (2.2–10.2) ***	2.6 (1.0–6.6) *
BFRB	2.9 (0.8–10.2)	2.8 (0.8–10.1)	5.7 (1.4–23.3) *
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$			

Note: There were fewer than 3 individuals reporting previous suicide attempt in the TS/CTD group, and fewer than 3 individuals reporting current suicidal ideation and current self-harm in both the BFRB and the TS/CTD group, hence no odds ratios were reported. Model 1 was unadjusted. Model 2 adjusted for age, gender and symptom severity (measured by CGI-S at baseline). Model 3 (sensitivity analysis) additionally adjusted for depressive symptoms (measured by SMFQ-C at baseline).

Abbreviations: BDD, body dysmorphic disorder; BFRB, body focused repetitive behavior; CGI-S, Clinical Global Impression – Severity; CI, confidence interval; OCD, obsessive-compulsive disorder; OR, odds ratio; SMFQ-C, Short Mood and Feelings Questionnaire, Child Version; TS/CTD; Tourette Syndrome or chronic tic disorder.

For suicidal ideation, the adjusted models (Table 3) showed that individuals with a primary diagnosis of BDD had about 2.5 times higher odds of both current (adjusted OR = 2.7, 95% CI, 1.5–4.9) and lifetime suicidal ideation (adjusted OR = 2.4, 95% CI, 1.3–4.2). Further, individuals in the TS/CTD group had about 60% lower odds of lifetime suicidal ideation, compared with the OCD group (adjusted OR = 0.4, 95% CI, 0.2–0.8). The odds of lifetime suicidal ideation in the BFRB group tended to be higher than those of the OCD group, although the difference was not statistically significant (adjusted OR = 1.7, 95% CI 0.8–3.7).

In adjusted models (Table 3), individuals with a primary diagnosis of BDD had 4.8 times higher odds of suicide attempts compared with those with OCD (adjusted OR = 4.8, 95% CI, 2.2–10.2). Odds were not significantly different for BFRB, relative to OCD, and no odds were reported for TS/CTD, due to the small number of cases (Table 2). Odds ratios for Model 2 analyses for all suicidality items are presented in Fig. 1.

In models further adjusting for self-rated symptoms of depression (Model 3), the ORs for BDD attenuated slightly, but the differences remained statistically significant relative to OCD, except for current suicidal ideation. In contrast, the fully adjusted ORs for BFRB and TS/CTD were slightly higher than in the main model when further adjusting for the depressive symptoms. On the other hand, the OR for the association

between TS/CTD and lifetime suicidal ideation, compared with OCD, was no longer statistically significant, while the association between BFRB and previous suicide attempts, compared with OCD, was statistically significant in this model (Table 3). In any case, all confidence intervals for the models including BFRB and TS/CTD were broad owing to reduced power and, therefore, unstable across analyses.

Treatment outcomes

Of the initial sample of 699 participants, 540 (77.3%) received treatment for their primary disorder at the clinic and had post-treatment data available. The mean number of CBT sessions was 15.1 (SD = 8.4, range = 6–53) for the OCD group, 18.6 (SD = 8.5, range = 3–82) for the BDD group, 8.1 (SD = 2.5, range = 4–13) for the BFRB group, and 7.9 (SD = 2.8, range = 2–17) for the TS/CTD group.

Mixed-effects regression analyses exploring the within-group effects of each diagnostic group showed that all four groups experienced large and clinically meaningful reductions in symptom severity of their primary diagnosis. Reductions were also seen on most secondary measures, indicating improvements across the diagnostic groups in general function and depressive symptoms between baseline and posttreatment (**Supplementary Table 1**).

Frequencies and proportions for all self-harm and suicidality items before and after treatment for the 540 that received treatment at the clinic are shown in **Supplementary Table 2**. In the mixed-effects logistic regression analyses, there was a significant main effect of time on self-harm, corresponding to a 60% odds reduction over treatment (OR = 0.4, 95% CI, 0.2–0.7) (Table 4). The time × diagnosis interaction term was not statistically significant (OR = 0.9, 95% CI, 0.1–4.2), indicating that the magnitude of change in suicidal ideation over treatment did not differ significantly between the two groups. Similarly, there was a statistically significant reduction in current suicidal ideation over time (OR = 0.4, 95% CI, 0.3–0.7). Again, the time × diagnosis interaction term was not statistically significant (OR = 0.9, 95% CI, 0.3–2.9), indicating comparable change across individuals with OCD and BDD (Table 4).

Table 4

Logistic regression models for current self-harm and current suicidal ideation at the two time-points, baseline and post-treatment.

Variable (n)	Baseline		Post-treatment		Main effect of time ^a	Main effect of group ^a	Time x group interaction effect ^a
	%	SE	%	SE	OR (95% CI)	OR (95% CI)	OR (95% CI)
Current self-harm (last 2 weeks)							
					0.4 (0.2–0.7) **	3.1 (1.1–8.7) **	0.6 (0.1–4.2)
OCD	5.9	0.1	2.3	0.1			
BDD	13.8	0.1	4.2	0.1			
Current suicidal ideation (last 2 weeks)							
					0.4 (0.3–0.7) ***	4.4 (1.9–10.3) **	0.9 (0.3–2.9)
OCD	13.5	0.1	7.3	0.1			
BDD	31.7	0.1	18.7	0.2			
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$							

Note: There were fewer than 3 individuals reporting current suicidal ideation and current self-harm in both the BFRB and the TS/CTD group, hence no odds ratios were reported. ^a OCD was specified as the reference category for diagnosis and baseline as the reference for time.

Abbreviations: BDD, body dysmorphic disorder; CI, confidence interval; OCD, obsessive-compulsive disorder; OR, odds ratio; SE, standard error.

DISCUSSION

In this study, we used a large naturalistic cohort of treatment-seeking adolescents with OCRDs and TS/CTD to explore current and lifetime self-harm, suicide ideation, and suicide attempts. Taken together, the results point to three key findings.

First, self-harm and suicidality were common across all the disorders investigated. A majority of youth with OCRD (including OCD, BDD, and BFRB) and a third of those with TS/CTD presented with at least one type of self-harm or suicidal behavior.

Second, while the risk was considerable across all diagnostic groups, it varied substantially across disorders, with BDD representing a particularly high-risk group. Notably, three-quarters of adolescents with BDD reported experiencing self-harm and/or suicidality. Individuals with a primary diagnosis of BDD had

twice as high odds of self-harm (lifetime, but not current), as well as suicidal ideation (current and lifetime), compared to adolescents with OCD, even after adjusting for age, gender, and symptom severity. Further, in adjusted models, youth with BDD had a fivefold increased risk of previous suicide attempts compared with those with OCD. These differences attenuated slightly but remained statistically significant (except for current suicidal ideation) in additional models also adjusting for depressive symptoms. This suggests that the excess suicidality risk in BDD cannot be explained solely by demographic characteristics (e.g., a significantly larger proportion of girls, who generally present with higher self-harm [52] and clinical variables (e.g., increased severity, co-occurring depressive symptoms), but rather that suicidality may be intrinsically linked to core features of BDD, such as pervasive appearance-related anxiety and shame or severe self-criticism [53, 54], and/or the consequences of the disorder, such as social withdrawal. This also aligns with previous studies [4, 19] suggesting that BDD carries a risk over and above comorbid depression. Previous research also highlights a shared underlying risk (e.g., shared genetic liability) for both OCD and BDD and suicidality [19, 20].

Despite being less common than in BDD, the rates of self-harm and suicidal behaviors in the OCD group were still substantial, with a third of the OCD sample reporting previous self-harm, half of the sample having a history of suicide thoughts, and 4% having attempted suicide, which is higher than previous studies on young people with OCD [20, 21]. For BDD, the rates of self-harm and suicidal ideation matched previous studies, suggesting that a majority of adolescents with BDD struggle with self-harm and suicidal behaviors [55, 56]. Further, in this sample, one in five youth with BDD reported to have attempted suicide, which was in line with previous studies that have shown increased risk of intentional self-harm and suicide attempts at the population level [4].

In the current study, the BFRB group only included 30 individuals, hence the risk estimates were less precise, and some could not be calculated. Across all self-harm and suicide items with available data, the odds ratios from the fully adjusted models were comparable to those in the OCD group. Rates of previous self-harm, suicide thoughts and suicide attempts were similar to those reported in the OCD group, and largely matched a previous review including a handful of studies of mostly adults [6].

Self-harm and suicidal behaviors were less common in TS/CTD than in OCD, even after adjusting for gender and age, despite the TS/CTD group comprising a higher proportion of boys and younger individuals, characteristics generally associated with lower suicidality risk. Like the BFRB group, the tic disorder sample was small, leading to imprecise results. Compared to the OCD sample, the TS/CTD group had about half the odds of lifetime suicidal ideation. The rate of lifetime self-harm was also the lowest in our sample, but it did not differ significantly from the OCD group. Nonetheless, despite being the least risky group within our study, one in seven had a history of self-harm and one in four reported previously having had suicide thoughts, which are higher numbers than previous studies with youth samples that have reported rates around 10% of self-harm and suicidal ideation [17, 22].

A third key finding was that self-harm and suicidal ideation improved with multimodal treatment, including CBT and medication when deemed appropriate. In line with our previous naturalistic evaluations [26, 27, 46, 47], individuals from all four diagnostic groups showed substantial improvement after treatment, both on

specific symptoms of their primary diagnosis and general functioning. Importantly, in line with this general improvement, both self-harm and suicidal ideation decreased significantly over the course of treatment. Due to the small numbers at baseline, odds were not calculated for BFRB and TS/CTD, but in the OCD and the BDD groups the odds of both current self-harm and suicidal ideation were 60% lower after treatment. This is an encouraging finding indicating that evidence-based treatment for both OCD and BDD may also be effective in reducing self-harm and suicide thoughts. Nonetheless, suicide thoughts persisted in about one in five youth in the BDD group, suggesting that treatment for BDD, while beneficial, may not fully reduce suicidal ideation in BDD.

These findings have several important clinical implications. Most importantly, self-harm and suicidality was common across the whole sample, which highlights the importance of suicide risk assessment in all disorders included in this study. BDD appeared to represent a particularly high-risk subgroup for self-harm and suicidality, even after accounting for overall symptom severity and depressive symptoms. Hence, young people with this condition may need additional surveillance and suicide prevention efforts. The substantial reduction in self-harm and suicide thoughts in both OCD and BDD during treatment is reassuring and supports continued efforts to improve access to evidence-based treatments. Future research should also include larger samples of individuals with BFRB and TS/CTD.

This study has several strengths, including the large sample with well-defined cases of adolescent OCRDs and tic disorders consecutively collected from a specialist clinic, with clinician-rated measures of self-harm and suicidality, both before and after treatment. Due to the large sample, we were able to study differences in self-harm and suicidal behaviors between several closely related disorders, which to the best of our knowledge, had not been done before in an adolescent sample. Furthermore, our analyses were able to adjust for several clinically relevant variables known to be associated with self-harm and suicide risk. The study also had some limitations. First, statistical power was limited for BFRB and TS/CTD, resulting in reduced power or inability to conduct some of the comparisons. Second, because of the lack of a control group, we cannot conclude that the decrease in self-harm and suicidal ideation was a consequence of treatment as opposed to passage of time or other factors. Finally, because this was a specialist setting, results may not generalize to other clinical contexts as the included cases may be more severe or complex, which may have led to self-harm and suicidality being more common than in other clinic or community settings.

Conclusions

In this large clinical cohort of adolescents with OCRDs and chronic tic disorders, self-harm and suicidality were generally common; however, it also varied by diagnosis. Compared to OCD, BDD consistently showed the highest rates in self-harm, suicide thoughts, and suicide attempts, whereas TS/CTD showed comparatively lower rates. Self-harm and suicidality improved over the course of multimodal treatment for OCD and BDD. These findings suggest that ongoing suicide risk assessment may be warranted in adolescents with OCRDs.

Declarations

Competing Interests

Competing interests: Lorena Fernández de la Cruz receives royalties for contributing articles to UpToDate, Wolters Kluwer Health and for editorial work from Elsevier. David Mataix-Cols receives royalties for contributing articles to UpToDate, Wolters Kluwer Health, and is co-owner of Scandinavian E-Health AB, all outside the submitted work. The rest of authors report no potential conflict of interest.

Author Contribution

DR, LFC and DMC contributed to the study concept and design. DR prepared and analyzed the data, wrote the original manuscript text and prepared all figures and tables. All authors contributed to the interpretation of data and critically reviewed the manuscript.

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Data Availability

The data that support the findings of this study are not publicly available due to ethical and legal restrictions related to the protection of participant confidentiality and sensitive personal data under Swedish legislation. Data may therefore not be shared publicly.

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Figures

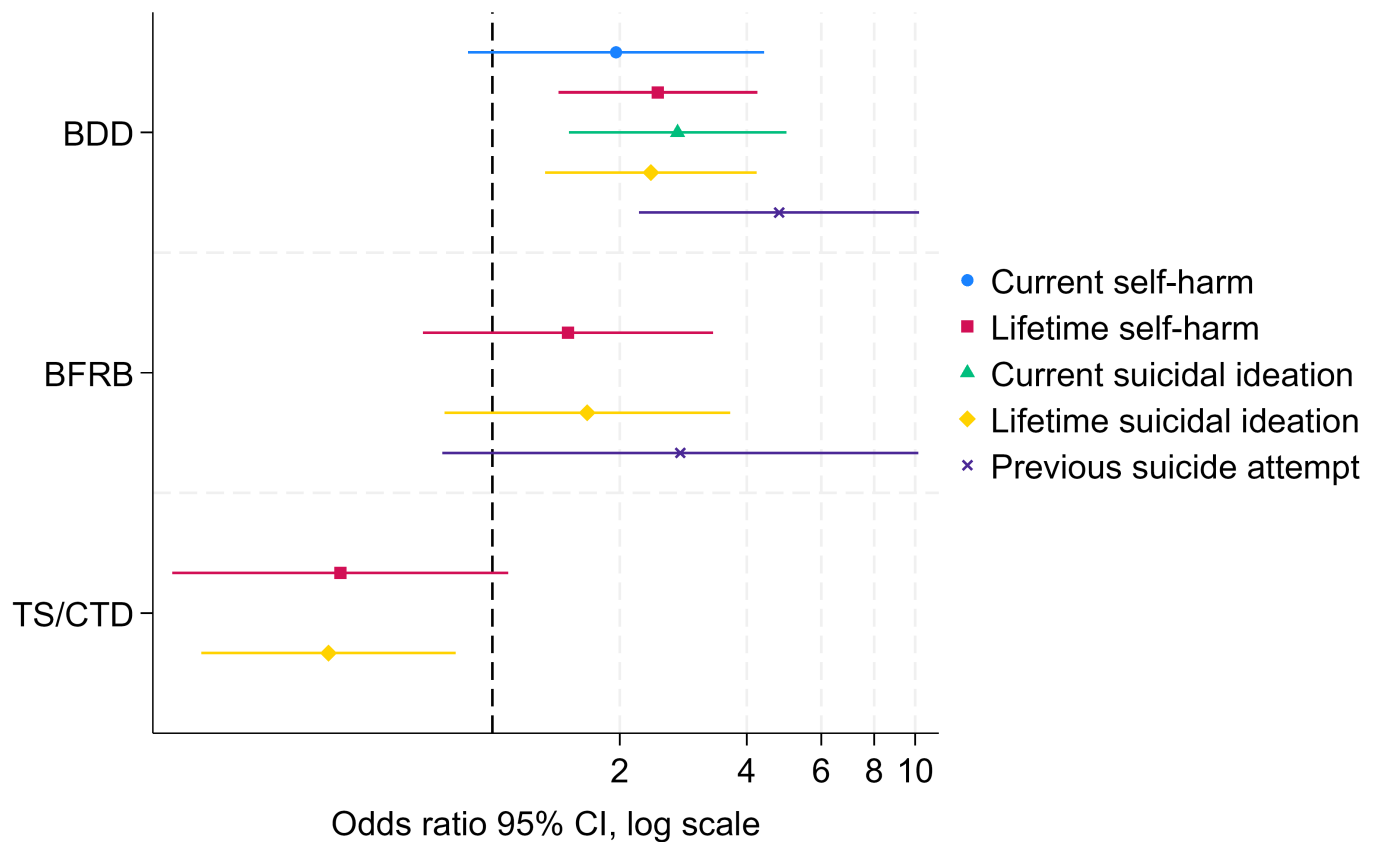


Figure 1

Odds ratios with 95% confidence intervals from the fully adjusted models (adjusted for age, gender and symptom severity) for all suicidality measures assessed at baseline, among individuals with BDD, BFRB and TS/CTD each compared with individuals with OCD.

Note: There were fewer than 3 individuals reporting previous suicide attempt in the TS/CTD group, and fewer than 3 individuals reporting current suicidal ideation and current self-harm in both the BFRB and the TS/CTD group, hence no odds ratios were reported.

Abbreviations: BDD, body dysmorphic disorder; BFRB, body focused repetitive behavior; CI, confidence interval; OCD, obsessive-compulsive disorder; TS/CTD; Tourette Syndrome or chronic tic disorder.

Supplementary Files

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