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ORIGINAL CONTRIBUTION

Correlates, stability and predictors of borderline personality disorder among previously suicidal youth

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Abstract This article examines a large cohort of previously suicidal adolescents, identifying those that surpassed threshold criteria for borderline personality disorder (BPD), according to the Abbreviated Diagnostic Interview of Borderlines (Ab-DIB), and determining the stability, correlates and predictors of BPD from early-to-late adolescence. Two hundred and eighty-six youth (mean baseline age 14.6 years; SD 1.5), presenting consecutively to a metropolitan pediatric hospital emergency department for evaluation of suicidality, were assessed at initial consultation for Axis I and II disorders and demographic and clinical variables. Two hundred and twenty-nine (80 %) were re-assessed for those variables 4 years later and 204 (70.3 %) had complete data sets at recruitment and follow-up. Previously suicidal youths who met BPD threshold on the Ab-DIB at recruitment were distinguishable at baseline from those who did not in conduct disorder symptoms ($p < 0.003$), lower levels of functioning ($p < 0.001$), drug use ($p < 0.001$), stressful life events ($p < 0.003$) and family relations ($p < 0.001$). The BPD diagnosis was consistent, according to this measure, at

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baseline and follow-up for 76 % of participants. Four groups with respect to borderline pathology (persisting, remitting, emerging and never) were identified (ICC = 0.603, 95 % CI = 0.40–0.78). Persistent BPD status was predictable by older age at presentation ($p < 0.01$) and level of functioning ($p < 0.05$). Eight percent were also suicidal at the 4-year follow-up. Using a self-report measure of BPD, we suggest that suicidal youth can indeed be diagnosed with the disorder at 14 years old, supporting the shift from DSM-IV to DSM-5, given what appears to be its temporal stability, differentiation of those suffering with considerable symptomatology or not, and predictors of its status in late adolescence. The low suicidality rate at follow-up indicates a good short-term prognosis.

Keywords Suicide · Diagnosis · Adolescence · Personality disorder

Introduction

Borderline personality disorder (BPD), associated with severe morbidity including suicide risk, has been well described among adults [1], but less well characterized among adolescents. The recent publication of the DSM-5 acknowledges the existence of personality pathology prior to age 18 [2], as have several authors [3–4]. However, Hall [5] described adolescent "storm and stress", characterized by distress and fleeting identity confusion, contrasting it with the clinically significant, enduring, symptomatology that defines personality disorders (PDs) [2]. While adolescence may involve increased distress, when does borderline symptomatology exceed a threshold, becoming distinguishable from normative storm and stress? What follows is a description of a study conducted with suicidal adolescents, wherein a self-report measure of BPD was used in the time-sensitive setting of an emergency room.

Clinical and empirical findings suggest that adult BPD is accompanied by clinical correlates and predictors. It frequently derives from traumatic childhood experiences, including disrupted attachments, inappropriate parental behavior, maternal neglect and rejection, abuse and familial psychopathology [6]. Adolescent Axis I pathology (e.g., depressive and disruptive disorders) has been noted among adults later diagnosed with PDs [7–8]. It has also been demonstrated that adolescents with any personality disorder exhibited increased drug use and more frequent subsequent hospitalizations [9], adolescent Cluster-B disorders were associated with increased subsequent partner conflict [10] and that each additional co-morbid disorder almost doubled the odds of having a PD as an adult [7].

Hesitancy in diagnosing BPD in adolescence often stems from the stigma surrounding BPD and its presumed unfavorable prognosis. Although Gunderson and colleagues [11] recorded a high rate of remission (85 %) and low rate of relapse (12 %) in his 10-year follow-up of adults with BPD, participants continued to experience severe, persistent impairment in functioning, indicating that they likely continued to meet some, but not all, criteria for diagnosis. Zanarini and colleagues [12] similarly noted a high remission rate over a 10-year investigation of inpatients with BPD, but only 15 % continued experiencing symptoms of impulsivity and challenges managing interpersonal stresses, although there was a less significant decline of affective symptoms (dysphoria and emptiness) and fears of abandonment and dependency. One might anticipate a higher frequency of symptom endorsement during adolescence, as youth may more commonly be inclined toward interpersonal crises and life-stage changes. For instance, Yen and colleagues [3] noted modest stability of BPD diagnosis in suicidal adolescents across a 6-month period (kappa statistic was 0.25 for self-ratings and 0.42 for parent ratings).

Although prevalence within non-clinical adult samples has been reported at only 5.9 % [13], one study suggests that BPD exists among 15 % of male and 17.2 % of female adolescents in community samples [14] ($n = 733$) and another estimates its frequency at 22 % of adolescent outpatients [15]. These differences may result from using variable measures, applying adult-based criteria and conflation of BPD with normal adolescent storm and stress, to name a few.

Their degree of distress is noteworthy, as nearly all BPD sufferers will attempt suicide and an estimated 10 % will successfully commit suicide [16]. BPD sufferers are likely to initially attempt suicide in adolescence, more likely committing it after the age of 30, rendering suicidal attempts in adolescence a valuable clinical opportunity to intervene with at-risk individuals. Those rates are in the context of the overall Canadian and American 2009/2010 suicide rates of 9.0/100,000 [17] and 7.5/100,000 [18], respectively, among youth aged 15–19 years.

No investigator has reported on BPD symptomatology in a large cohort of particularly vulnerable early adolescent patients, of both sexes followed to late adolescence. This study was undertaken to explore correlates of BPD among suicidal adolescents, evaluate its stability into late adolescence and predict its outcome, helping clinicians identify such patients upon presentation for crisis evaluation, anticipating their clinical trajectory and distinguishing them from those suffering only with the transient condition of adolescence.

Three hypotheses were considered:

1. Group differences are apparent between previously suicidal adolescents with and without BPD at ages 14

and 18 years with respect to clinical and demographic variables at baseline and follow-up.
2. Suicidal adolescents presenting in crisis are a heterogeneous population consisting of four groups with respect to BPD (persisting, emerging, remitting, never). The majority of those meeting borderline threshold will do so at both points, suggesting BPD may have temporal stability. These groups will have distinct profiles with respect to Axis 1 disorders and levels of suicidality and functioning.
3. For adolescents meeting BPD threshold at 14 years, the risk factors for persisting BPD include drug use, prior hospitalizations and mood disorder.

Method

Procedure

The original recruitment process, sample and catchment area have been described [19]. What follows is a secondary analysis using that baseline data and data from the 4-year follow-up of that cohort. The sample was derived from a study of 286 suicidal adolescents presenting consecutively for emergency assessment to a Canadian pediatric hospital emergency department (ER) serving a metropolitan area of 3.9 million people and not requiring admission for surgical or medical reasons [19]. The majority of assessments were made proximal (within 24 h) to the suicide attempts or ideation, and consisted of at least 60–90 min of psychiatric interview of the family and of the child separately, exploring ego strengths and weaknesses, capacity for insight and alliance with the health-care team, strengths of support network, school performance and needs for academic assessment and remediation and presence of axis I and II disorders. When discharge was deemed appropriate, safety planning was discussed with the patient and family, and patients were scheduled for outpatient follow-up assessments, at which time medication needs would be further assessed. Prior to discharge from the ER, patients were approached for consent into the study and reassured that their decision would not affect access to follow-up services. As planned from recruitment onset, patients were asked for contact phone numbers and re-contacted 4 years later for continued participation. The study followed Canada's Tri-Council guidelines for ethical conduct in research [20] and all patients signed informed consent.

Sample

Of the original cohort of 286, 92 % ($n = 263$) agreed to follow-up interviews 6 months later [21]. Further attrition (12 %; $n = 34$) occurred 4 years after initial assessment, as one patient had died, others could not be located and some declined further evaluation, leaving 229 (80 %) who participated in this study. Of these, 219 (77 %) fully completed the questionnaires, leaving 204 (71 %) with complete BPD data at both points. Of note, one had died from an accidental heroin overdose.

Dropouts were similar to participants in age and sex (mean 14.6 years each; female 70.7 and 68.9 % respectively). They revealed no statistically significant differences from participants in meeting BPD criteria, although at initial assessment non-participants reported significantly lower prevalence of depression (34 vs 53 %;$p < 0.05$ and alcohol consumption (37 vs 55 %; $p < 0.05$), as well as significantly *lower* levels of reported family problems (IFR means 26, SD 3.26, vs 45, SD 1.61; $p < 0.05$). Non-participants had a significantly higher baseline level of suicidality (mean 2.78; SD 1.29 vs mean 2.25; SD 1.09; $p < 0.05$).

There were no reported suicide deaths among this cohort as per the provincial coroner's report at the 4-year follow-up.

The recruitment interview protocol was conducted by five research assistants and the follow-up interview by three others, all either bachelor's- or master's-level students. To ensure inter-rater reliability, RAs practiced interviews until agreeing 90 % of the time within a 10-point range with an experienced rater on the Children's Global Assessment Scale (CGAS) [22] and completely agreeing on ten consecutive interviews on suicidality scores and the Diagnostic Interview Schedule for Children (DISC) [23]. Follow-up interviews, lasting approximately 3 h, were administered at the hospital, generally 1 week after the contact phone call.

Measures

Recruitment

General socio-demographic data were obtained, including patients' medical and psychiatric history and discharge plans, and parental and family data.

To measure Axis I disorders, the DISC modules for Depression and Conduct Disorder [24], which commonly co-occur among patients suffering from BPD, were administered. The DISC, designed to assess pediatric psychiatric diagnoses, has moderate test–retest agreement for the conduct-disorders module (ICC = 0.56–0.59) and the depressive-disorders module (ICC = 0.50–0.56), while inter-rater reliability is quite good for conduct disorder (kappa >0.70) and good for major depressive disorder (kappa = 0.55–0.66).

The Spectrum of Suicidal Behavior Scale (SSBS) [25], used to measure the patient's level of suicidality along a 5-point Likert-type scale comprised non-suicidal behavior (rated a), suicidal ideation (b), suicidal threats (c), mild suicidal attempts (d) and serious suicidal attempts (e). It was administered to the suicidal adolescent by the interviewer, yielding a higher percentage of positive responses than elicited through the parents [26]. A random selection of 10 % of the charts ($n = 23$) was re-coded by an independent RA, achieving a high correlation for suicidality ratings (kappa = 0.90).

The CGAS [22] evaluated the overall severity of disturbance. It has a 100-point rating scale designed to evaluate children and adolescents aged 4–16 years. The CGAS score was compiled using interview information on the patient's academic and recreational performance, psychiatric impairment (including suicidality), family functioning, substance use and involvement with youth protection and the law. A random sample of 26.2 % of the charts ($n = 60$) was re-coded by an independent RA, yielding an inter-rater correlation of kappa = 0.88.

A brief substance use questionnaire created for this study recorded the frequency of cigarette, alcohol and street drug (e.g., marijuana, hashish, crack and cocaine) consumption, and whether usage began prior to the age of 12 and without parental consent. Although frequencies were recorded as daily usage, 1–6 days per week, 1–3 days per month and less than once per month, data were entered categorically as either the presence (to any extent), or absence of drug or alcohol consumption.

The Coddington Life Events Scale (CLES) [27], a 40-item self-administered questionnaire, measured the patient's and family's stressful and precipitating life events.

The Index of Family Relations (IFR) [28] is a 25-item self-report scale, designed to quantify the extent, severity and magnitude of family problems. It functions as an overall measure of intra-family stresses, scored from 0 to 100, and has excellent internal consistency (alpha = 0.95). Test–retest data are not available [29].

Due to time constraints in the ER setting, we could not use the Diagnostic Interview for Borderlines-Revised (DIB-R; it requires 60–75 min to administer), which is a validated structured interview [30] of BPD used extensively in BPD research and with demonstrated diagnostic reliability. By contrast, the Abbreviated Diagnostic Interview for Borderlines (Ab-DIB) is a 26-item self-report measure, requiring only 10 min to administer and covering components of the borderline construct found to be more prominent in adolescents and young adults [31]. Internal consistencies ranged from 0.80 to 0.86 and test–retest intraclass correlations ranged from ICC = 0.77 to 0.95. Compared to the DIB-R, the Ab-DIB demonstrated good overall convergence (ICC = 0.77), high sensitivity (0.88) and high concurrent validity (0.68, $p < 0.001$) [32]. The receiver operating characteristic (ROC) analysis yielded an area under the curve of 0.87 ($p < 0.001$). Sensitivity and specificity ranges were 0.82 and 0.73 for the 14- to 17- and 18- to 21-year-old subsamples, respectively, when applying cutoff scores of 11.5 for use for ages 18–21 years. The agreement between categorical diagnoses on the two instruments was fair. Kappa coefficients for the 14- to 17- and 18- to 21-year-old subsamples were 0.67 ($p < 0.0001$) and 0.53 ($p < 0.0001$), respectively [31]. These thresholds were employed for this study's analyses to differentiate adolescents manifesting significant borderline symptomatology, thus treating the Ab-DIB as a diagnostic instrument.

Follow-up

Evaluation at the 4-year follow-up included a repetition of the DISC (both modules), the SSBS, the CGAS, the alcohol and substance use questionnaire and the Ab-DIB. A report of interim hospitalizations was included.

Data analysis

Group differences between BPD and non-BPD adolescents were assessed for socio-demographic and clinical variables at recruitment and follow-up, using *t* tests for continuous variables and Chi-square analysis for categorical variables. Individuals were classified by presence or absence of BPD at both times. Differences between trajectories were assessed using one-way ANOVA for continuous variables, likelihood-rate Chi-square analyses for categorical variables and Fisher's exact test where Chi-square distribution assumptions were compromised by cell sparseness. Additional longitudinal specific tests were estimated by calculating the intra-class correlation for BPD diagnosis as well as its intra-class manifest association [33].

Risk ratios were calculated for baseline demographic and clinical predictors of BPD at follow-up. Analyses were conducted with STATA 10.0 [34].

Results

Demographic characteristics of the sample, previous suicide attempts, substance use and family and treatment variables are presented in Table 1.

Hypothesis 1 Table 2 presents intergroup differences at ages 14 and 18 years, identifying variables differentiating participants with and without BPD threshold. BPD status

Table 1 Sample description

Patient variables:	
Sex, n (%)	
Women	197 (68.9)
Age, Mean (SD) Ethnicity[a], *n* (%)	14.6 (1.5)
Caucasian	157 (69.5)
African american	17 (7.5)
Hispanic	5 (2.2)
Aboriginal	7 (3.1)
Asian	12 (5.3)
Other	28 (12.4)
Resides with[b], *n* (%)	
Mother and father	81 (42.0)
Mother or father	88 (45.6)
On own	13 (6.7)
Relative	3 (1.6)
Foster home	6 (3.1)
Group home	2 (1.0)
Previous suicide attempt(s)[c], *n* (%)	140 (49.5)
Present alcohol use[d], *n* (%)	98 (51.6)
Present drug use[e], *n* (%)	148 (52.7)
Family variables:	
Parental marital status[f], *n* (%)	
Married	131 (49.6)
Separated	32 (12.1)
Divorced	74 (28.0)
Common law	6 (2.3)
Single	17 (6.4)
Widowed	4 (1.5)
Mother's occupation[g], *n* (%)	
Employed	155 (61.5)
Unemployed	94 (37.3)
Retired	3 (1.2)
Father's occupation[h], *n* (%)	
Employed	195 (84.1)
Unemployed	32 (13.8)
Retired	5 (2.2)
Treatment variables:	
Previous psychiatric hospitalizations[i], *n* (%)	70 (24.5)
Current involvement in therapy[j], *n* (%)	59 (26.0)
Past involvement in therapy[k], *n* (%)	211 (93.4)
Department of Youth Protection involvement[l], *n* (%)	46 (16.1)
Placement pre-study[m], *n* (%)	14 (4.9)

[a] $n = 226$, [b] $n = 193$, [c] $n = 283$, [d] $n = 190$, [e] $n = 281$, [f] $n = 264$, [g] $n = 252$, [h] $n = 232$, [i] $n = 286$, [j] $n = 227$, [k] $n = 226$, [l] $n = 285$, [m] $n = 286$ (Includes subjects in foster, group and residential homes)

was associated at recruitment with conduct disorder, lower levels of individual and family functioning and drug use and stressful life events.

Hypothesis 2 Individuals were classified by BPD status at 14 and 18 years. Supporting Hypothesis 2, 155 youths (76 % of 204 with complete BPD data) met cutoff criteria at both points and were classified as "persisting." Those meeting BPD threshold only at recruitment were classified as "remitting" (27/204; 13.2 %), only at the 4-year follow-up as "emerging" (7/204; 3.4 %) and at neither point as "never BPD" (15/204; 7.4 %).

Differences were assessed between these trajectories (Table 3). Intra-class correlation analyses indicate that overall BPD diagnosis presented considerable stability (ICC = 0.603; 95 % CI [0.40–0.78]; Odds ratio = 8.02, 95 % CI (4.01–16.84)).

Hypothesis 3 BPD status at follow-up can be predicted by older age at first presentation for suicidality and lower level of individual functioning, but not by drug use, prior hospitalization or mood disorder (Table 4).

Only 17 (7.8 %) of 219 patients remained suicidal (scored greater than 1 on the SSBS) at follow-up, 16 (94.1 %) of whom met BPD criteria.

No sex differences were discerned with respect to BPD and other study variables.

Discussion

This study examined BPD in adolescence among 229 previously suicidal youths, assessing the potential validity of the construct during adolescence. Its longitudinal design helped control for potential biases inherent in previous cross-sectional and retrospective studies. It applied a self-report measure of BPD, cutoff criteria for the diagnosis and a restricted focus on BPD in contrast to overall Cluster-B diagnoses and recruited an at-risk population.

Although our sample is limited to youth who exhibit suicidal ideation, treating clinicians can observe the pattern of BPD symptomatology within this high-risk adolescent population. When assessing such suicidal adolescents, one often encounters conduct disorder, lower levels of functioning (similar to incidence in the adult BPD population) [11], drug use, stressful life events, greater family dysfunction and major depression (a trend), all of which were significantly associated with BPD threshold attainment at our first evaluation. These variables were included in our study not only due to their representativeness of this population, but also for their ease of identification and monitoring clinically, while tracking their evolution during the treatment process.

Consonant with the impaired functioning characterizing the adult analog [11], the mean CGAS score of our subjects was only 59 at follow-up (albeit an increase of 20 points

Table 2 Group differences between those with and without BPD at recruitment and follow-up

Variable	BPD yes	BPD no	Chi ^{2}/*t* test; *p* value
BPD at recruitment	235 (87.69)	33 (12.31)	
Age, mean (SD)	14.65 (1.40)	14.24 (2.29)	n.s.
Gender (women), *n* (%)	163 (69.36)	23 (69.70)	n.s.
Depression, *n* (%)	122 (51.91)	9 (27.27)	7.03; $p = 0.008$
Conduct disorder, *n* (%)	61 (25.96)	1 (3.03)	8.67; $p = 0.003$[1]
CGAS >50, *n* (%)	57 (24.26)	18 (54.55)	11.78; $p < 0.001$[1]
Alcohol use, *n* (%)	84 (35.74)	10 (30.30)	n.s.
Drug use, *n*(%)	134 (57.02)	8 (24.24)	12.48; $p < 0.001$[1]
Coddington Stress Life Events, mean (SD)	11.06 (6.89)	7.63 (4.53)	2.77; $p = 0.003$[1]
Index of Family Relations (IFR), mean (SD)	45.38 (23.86)	31.50 (23.71)	3.09; $p = 0.001$[1]
Prior hospitalizations, Mean (SD)	2.31 (0.95)	1.83 (0.92)	2.34; $p = 0.010$
Previous visits to the ER Mean (SD)	1.48 (1.03)	1.24 (0.69)	1.19; $p = 0.118$
BPD at follow-up	173 (79.36)	45 (20.64)	
Age, mean (SD)	14.57 (1.37)	14.81 (2.01)	n.s.
Gender (women), *n* (%)	121 (69.94)	25 (55.56)	n.s.
Depression, *n* (%)	47 (27.17)	3 (6.67)	7.29; $p = 0.007$
Conduct disorder, *n* (%)	14 (8.09)	2 (5.13)	Fisher's exact = 0.742
CGAS > 50, *n* (%)	117 (67.63)	36 (80.00)	5.18; $p = 0.023$[2]
Alcohol use, *n* (%)	61 (35.26)	14 (31.11)	n.s.
Drug use, *n* (%)	47 (27.17)	15 (33.33)	n.s.
Suicide, *n* (%)	16 (9.24)	1 (2.22)	Fisher's exact = 0.205

Bonferroni correction 0.05/11 = 0.005

1 = statistically significant difference after Bonferroni adjustment

Bonferroni correction 0.05/8 = 0.006

2 = statistically significant difference after Bonferroni adjustment

from the time of crisis), reflecting persistent moderate functional difficulties or symptoms.

Significantly, 76 % (155/204) of suicidal youth at recruitment surpassing cutoff criteria for BPD according to the AB-DIB met those same criteria 4 years later, compatible with findings of BPD *traits* in community samples ($r = 0.464$ [35]; $r = 0.53$–0.73 [36]), yet higher than other reports using threshold criteria (23 % [37]; 14 % [38]). Intra-class correlation analyses indicated that overall BPD diagnosis presented considerable stability (ICC = 0.603; 95 % CI [0.40–0.78]). The odds of meeting BPD threshold criteria (using the Ab-DIB) at follow-up for an adolescent so diagnosed at baseline (8.02) were eight times those for an adolescent without meeting those criteria at baseline. Although it is stated in the ICD-10 [39] that "it is… unlikely that the diagnosis of personality disorder will be appropriate before the age of 16 or 17 years," owing partly to reports of its limited stability [38], our observations of study participants support the notion that BPD exists as early as 14 years. The BPD-persistent group, and perhaps also the emerging group, might be those who evolve into BPD in adulthood.

The 16.7 % (34/204) who satisfied BPD criteria at only one point may correspond to the classic notion of adolescent "storm and stress", or Hall's concept of adolescent "storm and stress" [5], experiencing transient borderline functioning compatible with a developmental fluidity of personality organization during adolescence. Predictors of persisting BPD permit distinction between this condition and the adolescent BPD construct.

Lower level of functioning and the age of presentation (14 or older) predicted BPD at follow-up on multivariate analysis. Perhaps, older subjects at recruitment are those with less help-seeking behavior (prior hospitalizations) to facilitate access to care before age 14, leaving time for consolidation of dysfunctional defenses prior to consultation and becoming less amenable to intervention. Non-persistence among adolescents younger than 14 years old at recruitment may reflect a normative pubertal process wherein emotional regulation is incomplete and defenses more mutable. Surprisingly, drug use and mood disorder were not such predictors, perhaps due to their overrepresentation among adolescents.

As in other studies, we observed an absence of gender differences [13] among adolescents surpassing BPD threshold criteria, when considering such variables as depression and conduct disorder. This is surprising in light of the common association of adult BPD with females. Perhaps, BPD bifurcates sometime after entry into adulthood, with BPD pursuing one trajectory among females, and CD another among males, or its dearth among adult males may be due to an absence of measures and clinical acumen sensitive enough to detect its presence.

Although only 7.8 % of the sample remained suicidal at follow-up, fully 94.1 % ($n = 16$) of those met threshold for BPD, suggesting adolescent BPD as a risk factor for

Table 3 Subgrouping of previously suicidal youth: BPD status at baseline and follow-up

	(1) Never BPD	(2) Emerging BPD	(3) Remitting BPD	(4) Persisting BPD	*p* value
BPD diagnosis at Follow-up, n[a] (%)	15 (7.35)	7 (3.43)	27 (13.24)	155 (75.98)	ICC = 0.60395 % CI = [0.40–0.78]
Sex					
Women, *n* (%)	8 (5.76)	5 (3.60)	17 (12.23)	109 (78.42)	Fisher's exact = 0.511
Men, *n* (%)	7 (10.77)	2 (3.08)	10 (15.38)	46 (70.77)	
Age, mean (SD)	15.66 (1.95)	12 (0)	14.33 (1.92)	14.72 (1.30)	11.15; $p = 0.0001^{\beta,1,2,4,5,6}$
Baseline variables					
Prior hospitalizations, mean (SD)	2.07 (0.83)	1.57 (1.13)	1.78 (0.80)	2.41 (0.92)	5.43; $p = 0.001^{\beta,6}$
Previous visits to the ER, mean (SD)	1.15 (0.36)	1.43 (1.13)	1.38 (0.90)	1.47 (1.00)	n.s.
Alcohol use, *n* (%)	7 (46.67)	1 (14.29)	8 (29.63)	59 (38.06)	n.s.
Drug use, *n* (%)	4 (26.67)	1 (14.29)	14 (51.85)	90 (58.06)	Fisher's exact = 0.017
Depression, *n* (%)	5 (33.33)	2 (28.57)	14 (51.85)	87 (56.13)	Fisher's exact = 0.206
Conduct disorder, *n* (%)	0 (0.00)	0 (0.00)	9 (33.33)	40 (25.81)	Fisher's exact = 0.023
CGAS >50, *n* (%)	7 (46.67)	3 (42.86)	9 (33.33)	34 (21.94)	Fisher's exact = 0.092
Index of family relations, mean (SD)	35.42 (24.93)	27.94 (25.05)	48.59 (15.02)	46.75 (24.92)	n.s.
Coddington stressful life events, mean (SD)	7.07 (3.65)	7.86 (4.38)	7.81 (5.10)	11.40 (7.01)	4.24; $p = 0.006$
DYP[b] involvement, mean (SD)	0 (0.0)	0 (0.0)	0.59 (2.69)	2.73 (9.16)	1.12; $p = 0.341$
Follow-up variables					
Depression, *n* (%)	1 (6.67)	0 (0.0)	2 (7.41)	45 (29.03)	Fisher's exact = 0.011
CGAS >50, *n* (%)	14 (93.33)	6 (85.71)	22 (81.48)	105 (67.74)	Fisher's exact = 0.101
Alcohol use, *n* (%)	4 (26.67)	3 (42.86)	10 (37.04)	54 (34.84)	n.s.
Drug use, *n* (%)	9 (60.00)	3 (42.86)	6 (22.22)	39 (25.16)	Fisher's exact = 0.025
Suicidality, *n* (%)	1 (6.67)	0 (0.0)	0 (0.0)	15 (9.68)	Fisher's exact = 0.359

Bonferroni correction: 0.05/17 = 0.003

3 = statistically significant difference even after Bonferroni adjustment

Post hoc intergroup differences—1:1 > 2; 2:1 > 3; 3:1 vs 4; 4:2 > 3; 5:2 > 4; 6:3 > 4

[a] Only subjects with two corresponding data points reported on

[b] DYP, Department of youth protection

suicidality in this population at 18 years, and that suicidality may be an indicator of BPD. This is especially interesting in the context that BPD sufferers are likely to initially attempt suicide during adolescence, more likely actually committing it after the age of 30 years [17]. Suicidal attempts in adolescence thus present a clinical opportunity to avert this outcome, as BPD is a lifelong affliction associated with functional impairment. Hence, adolescent BPD remains of clinical concern, as reflected by its ongoing presence among almost all of those with persisting suicidality.

That only 7.8 % of the sample remained suicidal at follow-up might also inform us that adolescent BPD and suicide are not synonymous. They most often co-occur, at times of acute distress associated with the intrapsychic and interpersonal problems of BPD.

This study extends the findings of previous authors by focusing on adolescents treated as outpatients who surpassed cutoff criteria for BPD on the Ab-DIB. It suggests that, among a large cohort of suicidal adolescents, those with BPD are distinguishable from those not meeting BPD criteria and underlines diagnostic stability over time. The study findings support predicting ongoing diagnosis by age 14 and by clinical characteristics at recruitment.

Limitations

Only 71 % of the original cohort fully participated. Obvious difficulties exist in following impulsive adolescents, particularly as they begin moving away from home; retention rates for similar studies following children and their families are comparable (74 %, 2 years) [14].

It is unclear how inclusion of the remaining 29 % would have affected the results, since dropouts might reflect selection and attrition biases. Very conservatively, were all 29 % included among the never BPD or remitters, the stability of BPD from early-to-late adolescence would

Table 4 Relationship of baseline demographic and clinical variables to BPD diagnosis at 4-year follow-up

	BPD diagnosis at 4-year follow-up		Unadjusted models	Adjusted model
Baseline predictors	Yes = 173 (79.4)	No = 45 (20.6)	OR[a] (95 % CI)	OR[b] (95 % CI)
Sex				
Women, *n* (%)	121 (69.94)	25 (59.52)	1.10 (0.94–1.28)	0.99 (0.83–1.16)
Age groups				
12–13 years, *n* (%)	32 (58.18)	23 (41.82)	1.51 (1.20–1.91)***	1.58 (1.10–2.25)**
14–17 years, *n* (%)	141 (88.13)	19 (11.87)		
Depression, *n* (%)	93 (53.76)	19 (42.22)	1.07 (0.94–1.23)	0.98 (0.84–1.16)
Conduct disorder, *n* (%)	43 (24.86)	9 (20.00)	1.04 (0.90–1.21)	1.04 (0.90–1.21)
CGAS >50, *n* (%)	40 (23.12)	16 (34.78)	0.85 (0.71–1.02)	0.80 (0.64–1.00)*
Alcohol use, *n* (%)	64 (36.99)	15 (33.33)	0.97 (0.83–1.13)	0.92 (0.77-1.10)
Drug use, *n* (%)	95 (54.91)	18 (40.00)	1.11 (0.97–1.27)	1.00 (0.84–1.22)
Coddington stressful life events, mean (SD)	11.23 (6.95)	7.55 (4.60)	1.01 (1.01–1.102)	(0.99–1.00)
Index of family relations (IFR), mean (SD)	44.71 (25.13)	43.89 (19.91)	1.00 (0.99–1.00)	1.00 (0.99–1.00)
DYP involvement, mean (SD)	2.50 (8.72)	0.38 (2.16)	1.01 (1.00–1.01)**	1.00 (1.00–1.01)
Prior hospitalizations, mean (SD)	2.39 (0.94)	1.88 (0.81)	1.12 (1.06–1.19)***	1.07 (0.97–1.18)
Previous ER visits, mean (SD)	1.46 (0.99)	1.30 (0.76)	1.03 (0.98–1.09)	0.96 (0.97–1.18)

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

[a] Bivariate general linear model with log-link function

[b] Multivariate general linear model with log-link function

nevertheless have attained 48 %, suggesting adolescent BPD to be a substantial mental health issue.

Given the high suicide rate among adult BPD sufferers, it may seem surprising that none of our subjects suicided by the 4-year follow-up, perhaps reflecting exclusion of those at greater risk of suicide completion (suicidal adolescents requiring surgical and/or medical admission), and consistent with literature describing the higher likelihood of attempts during adolescence versus completed suicides during adulthood [40, 41]. It may alternatively reflect the therapeutic value of an ER assessment and resulting care.

The results may not be generalizable to all adolescents, as the study employed a clinical sample presenting electively for outpatient care.

Psychopathology was assessed using the Ab-DIB and the DISC rather than the more extensive but time-consuming DIB-R [31] and the Schedule for Affective Disorders and Schizophrenia for School-Age Children (KSADS) [42], reflecting time constraints in our emergency setting.

Having made our observations concerning the overwhelming presence of adolescents meeting BPD threshold on the Ab-DIB among our population of previously suicidal adolescents, a word of caution is due. First, and most importantly, if one were to consider the Ab-DIB as only a screening (rather than diagnostic) instrument, then the numbers reported in this study could be considered to reflect an overestimation of the prevalence of BPD in our cohort. That overestimation may be particularly pronounced given that our data was derived from a pool of actively suicidal youth who were in severe distress at baseline measurement. One could consider adolescents who actively think about suicide as a subpopulation with a particular sensitivity persisting with time, and thus interpret these data as reflecting continued adolescent crisis, accompanied by BPD-type symptomatology, akin to the descriptions of Hall, and lending instead to dimensional analysis as has been recommended with respect to adult populations [43].

Whichever perspective is considered, our findings point to the degree of distress experienced by this population of youth, as reflected in their initial and persisting symptomatology. Despite its limitations, the findings reported in this study could guide clinicians when assessing youth presenting for crisis assessment in identifying simple clinical characteristics predictive of a problematic outcome and worthy of treatment over time.

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Conflict of interest None.

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