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ORIGINAL ARTICLE

Childhood trauma and dissociation in patients with panic disorder, obsessive-compulsive disorder, and borderline personality disorder.

Part 1: Relationships between demographic, clinical, and psychological factors.

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Abstract

INTRODUCTION: Panic disorder (PD), obsessive-compulsive disorder (OCD), and borderline personality disorder (BPD) are associated with various psychosocial factors that may influence their onset and psychopathology. Dissociation encompasses a wide range of manifestations, from benign experiences to severe mental health issues. Research comparing childhood trauma and dissociation, general psychopathology, and the onset of the disorder among patients with PD, OCD, and BPD has not yet been published.

RESULTS: The severity of dissociative symptoms negatively correlated with the onset of the disorder, whereas it positively correlated with the disorder's overall severity and general symptomatology. Patients with more severe childhood trauma had an earlier onset of the disorder and more severe depressive and dissociative symptoms. They rated higher on the overall severity of the disorder. Physical abuse and neglect were associated with more severe PD, OCD, and BPD. Patients with BPD had higher levels of dissociation than those with PD or OCD. BPD was also connected with more severe childhood trauma than PD and OCD patients. Comorbidity exacerbated the severity of the psychiatric disorders.

CONCLUSIONS: Childhood trauma and dissociation play a significant role in anxiety and depressive symptoms in patients with PD, OCD, and BPD.

INTRODUCTION

Panic disorder (PD) is characterized by recurrent and unexpected panic attacks, often accompanied by somatic symptoms such as palpitations, sweating, trembling, and a feeling of shortness of breath or choking (APA 2013). The disorder is relatively common, with a lifetime prevalence estimated at 4.7% (Kessler *et al.* 2005; De Jonge *et al.* 2016). Women are twice more likely to be affected than men (Kessler *et al.* 2005). Panic disorder can occur at any age, but the most common onset time is during adulthood. It is also associated with a higher risk of developing other mental health disorders, such as major depressive disorder and agoraphobia. (Kessler *et al.* 2005).

Obsessive compulsive disorder (OCD) displays the presence of obsessions (unwanted and intrusive thoughts, images, or urges that recur) and compulsions (repetitive behaviours or mental actions that an individual feels compelled to perform in response to an obsession). (APA 2013). The lifetime prevalence of the disorder is estimated to be 2.3% (Ruscio *et al.* 2010). It usually begins in childhood or adolescence but can occur at any age (Ruscio *et al.* 2010). OCD is also associated with a higher risk of other mental disorders, such as depressive and anxiety disorders (Ruscio *et al.* 2010).

Unstable interpersonal relationships, unstable self-image and emotions characterize borderline personality disorder. Individuals may also exhibit impulsivity and repeated self-injurious or suicidal behaviour (APA 2013). The lifetime prevalence of borderline personality disorder is estimated to be 1.6% to 5.9% in the general population (Lenzenweger *et al.* 2007). The disorder is more common in women than men (Lenzenweger *et al.* 2007). The average age of onset is early adulthood, although many individuals show symptoms in childhood or adolescence (Zanarini *et al.* 2005). The course of the disorder can be very variable. Still, many patients will experience a reduction in their symptoms over time (Zanarini *et al.* 2024). Up to 50 % experience significant symptom resolution within 10 years (Zanarini *et al.* 2010).

Although these three disorders differ in many aspects, there are also some similarities. For example, they can be associated with high levels of anxiety, are often comorbid with depression, and can lead to significant functional impairment (Kessler *et al.* 2005).

Adverse childhood experiences (ACEs) are an important factor associated with the development of psychiatric disorders, including PD, OCD and BPD (Kolek *et al.* 2019; Hodny *et al.*2022; Ociskova *et al.* 2024). ACEs are linked with an increased risk of mental health problems in general. Still, the relationship with PD has received relatively little attention (Zhang *et al.* 2023). There are mild to moderate associations between overall ACEs and PD and individual ACEs. Similar to PD, ACEs are also associated with OCD. People with OCD often report higher rates of ACEs than the general population (Bilge *et al.* 2022). For BPD, the relationship with ACEs is even stronger. Many studies have consistently shown that almost all individuals with BPD report at least one form of ACEs, and many report multiple forms (Bozzatello *et al.* 2021). This indicates that ACEs may play a key role in the aetiology of BPD.

Although all three disorders – PD, OCD and BPD – are associated with ACEs, the degree and type of ACEs differ between them. For example, emotional abuse is a strong predictor for all three disorders. In contrast, physical abuse may be a stronger predictor for BPD than for PD or OCD (Schulze *et al.* 2022). Studies have also shown that ACEs, such as childhood trauma, are associated with more severe dissociation, depression, and anxiety (Zhang *et al.* 2023).

Dissociative experiences predict more intense symptoms, poor treatment adherence, and poor prognosis for several psychiatric disorders, including PD and OCD (Krause-Utz *et al.* 2021). Dissociation is common in panic disorder, where individuals may feel disconnected from themselves and their environment during anxiety episodes (Gulsun *et al.* 2007). Dissociation can also be a defence mechanism against feelings of anxiety (Soffer-Dudek 2014).

People with OCD often report higher rates of dissociative experiences than the general population (Bilge *et al.* 2022). Certain forms of dissociation, such as depersonalization, may be stronger predictors of OCD than others (Vazquez *et al.* 2022). A recent systematic review proposed that the prevalence of dissociative disorders in adults with OCD is 8 % (Sideli *et al.* 2023). Furthermore, individuals with OCD report more dissociative symptoms than the non-clinical population, and dissociative and obsessive-compulsive symptoms are moderately strongly correlated (Sideli *et al.* 2023). The severity of dissociation is directly related to the severity of obsessive-compulsive symptoms (Prasko *et al.* 2010; Belli *et al.* 2012; Belli *et al.* 2013; Semiz *et al.* 2014; Tatli *et al.* 2018) and symptoms of general anxiety and depression (Raszka *et al.* 2009; Prasko *et al.* 2010) in these patients.

In BPD, the relationship with dissociation is even stronger. Some studies have consistently shown that nearly all individuals with BPD report at least one form of dissociation, and many report multiple forms (Bozzatello *et al.* 2021). Dissociation is linked to various BPD symptoms. Stress dissociation, in particular, is prevalent in BPD and is hypothesized to interfere with psychosocial functioning and treatment outcomes (Krause-Utz *et al.* 2022). However, studies addressing dissociation in BPD are rare (Krause-Utz *et al.* 2021).

Although all three disorders – PD, OCD and BPD – are associated with dissociation, the degree and type of dissociation varies between them. For example, depersonalization is a strong predictor for all three disorders. At the same time, amnesia may

be a stronger predictor for BPD than for PD or OCD. Further research is needed to explore these differences and their implications for treatment and prognosis (Krause-Utz *et al.* 2021).

Thus, this proposed study fills a research gap by comparing rates of dissociation, depression, anxiety, and childhood trauma in patients with PD, OCD, and BPD.

Study objectives

This study aims to compare the three groups of patients in terms of their dissociation, symptoms of depression and maltreatment-related adverse childhood experiences.

Hypotheses

Four research topics were established based on literature findings from studies dealing with similar issues. Within each of these topics, specific hypotheses were established.

1. Dissociation:
- (1a) Patients with borderline personality disorder show more severe dissociation than patients with panic disorder.
- (1b) Patients with borderline personality disorder show more severe dissociation than patients with obsessive-compulsive disorder.

2. Depression symptoms:
- (2a) Patients with borderline personality disorder show more severe depressive symptoms than patients with obsessive-compulsive disorder.
- (2b) Patients with borderline personality disorder show more severe depressive symptoms than patients with panic disorder.

3. Anxiety symptoms:
- (3a) Patients with panic disorder show more severe anxiety than patients with obsessive-compulsive disorder.
- (3b) Patients with borderline personality disorder show more severe anxiety than patients with obsessive-compulsive disorder.

4. Adverse childhood experiences:
- (4a) Patients with borderline personality disorder show more severe childhood trauma compared to patients with panic disorder.
- (4b) Patients with borderline personality disorder show more severe childhood trauma compared to patients with obsessive-compulsive disorder.

METHODS

The study was conducted under standard conditions in an inpatient psychotherapy ward for anxiety, affective and personality disorders. Two independent psychiatrists confirmed the inclusion and exclusion criteria. Patients with a diagnosis of panic disorder, obsessive-compulsive disorder, or borderline personality disorder were included in the study.

Patients

The inclusion criteria were as follows:
- Diagnosis of panic disorder, obsessive-compulsive disorder, or borderline personality disorder according to ICD-10 research criteria.
- Age between 18 and 70 years.
- SSRI treatment resistance, meaning that patients have not responded to at least 12 weeks of previous treatment with SSRI antidepressants.

The exclusion criteria were as follows:
- Current depressive disorder
- High risk of suicide
- Organic mental disorder
- Current or anamnestic psychotic disorder
- Current substance abuse
- Severe somatic illness such as cancer or cardiovascular disease

Measurements

Beck Anxiety Inventory (BAI)

Beck anxiety inventory (BAI) is an instrument that consists of 21 questions (Beck *et al.* 1988). Patients rate the anxiety symptoms they perceived during the past week and their severity (Leyfer *et al.* 2006). This instrument has good internal consistency (mean $\alpha = 0.92$) (De Ayala *et al.* 2005). Kamaradova *et al.* (2015) validated the Czech translation of the BAI, where Cronbach's alpha was 0.92. Test-retest reliability after 1 week was 0.75.

Beck Depression Inventory (BDI-II)

Beck Depression Inventory – second version (BDI-II) is an instrument designed to identify and assess depressive symptoms. This instrument consists of 21 items where patients rate the symptoms they have experienced during the past 14 days (Beck *et al.* 1996). The method was standardized in Czech conditions by Ptáček *et al.* (2016) in parallel with Ociskova *et al.* (2017). The Czech version of the BDI-II has high internal consistency and reliability.

Clinical Global Impression (CGI)

The Clinical Global Impression Scale (CGI) is a tool for global assessment of the severity of psychopathology. It was developed by Guy (1976) and has been widely used in clinical and research settings. The CGI can be used in a form that is rated by a healthcare professional and a form that is used for self-assessment by the patient. The instrument's internal consistency is satisfactory (Zaider *et al.* 2003).

Dissociative Experiences Scale (DES)

Tab. 1. Demographic and clinical characteristics of the sample

Variable	Average value or frequency
Age	33.2 ± 11.5
Gender male/female	110/247
Age of onset of the disorder	21.5 ± 11.1
Duration of disorder	11.1 ± 9.9
Heredity no/yes	126/231
Education: primary/vocational/secondary / university	63/82/156/56
Occupation: unemployed/employed / student / disabled or retired	84/142/74/57
Marital status: single/married/divorced/widowed	224/53/78/2
Partner: no/yes	184/173
CGI	4.4 ± 1.4
BAI	24.8 ± 13.4
BDI-II	28.2 ± 12.9
DES	19.5 ± 17.6
DES-T	13.8 ± 15.9
Total CTQ-SF score	50.9 ± 18.7
Emotional Abuse	12.4 ± 5.7
Physical Abuse	8.0 ± 4.5
Sexual Abuse	6.7 ± 4.1
Emotional neglect	15.3 ± 5.3
Physical neglect	8.8 ± 3.9
Antidepressant index (n=301) (paroxetine equivalent)	40.5 ± 25.1
Anxiolytic index (n=19) (diazepam equivalent)	12.3 ± 10.6
Antipsychotic index (n=80) (risperidone equivalent)	2.0 ± 2.1
Antiepileptic index (n=40) (lamotrigine equivalent)	145.4 ± 110.9

BAI, Beck Anxiety Inventory; BDI-II, Beck Depression Inventory, second edition; CGI-CV, a clinician version of the Clinical Global Impression-Severity of the disorder; CGI, Clinical Global Impression-Severity of the disorder; CTQ-SF, The Childhood Trauma Questionnaire-Short Form; DES, Dissociative Experience Scale; DES-T, pathological dissociation subscale of DES

The Dissociative Experiences Scale (DES), developed by Bernstein and Putnam in 1986, is a self-rating instrument containing 28 items (Bernstein & Putnam 1986). This questionnaire measures a wide range of normal (e.g., daydreaming) and pathological dissociative experiences, including absorption and fantasy, experiences of depersonalization and derealization, amnesia, and pathological anxiety and dissociation (Waller & Ross 1997). Test-retest stability over time shows very good psychometric properties (0.93), and internal consistency, as assessed by Cronbach's alpha, is 0.96 (Frischholz *et al.* 1990). Regarding reliability, validity and factor structure, the Czech version corresponds to the original (Ptáček *et al.* 2006). The Cronbach's alpha for this method reaches a value of 0.95 in our research.

Childhood Trauma Questionnaire - Short Form (CTQ-SF)

This questionnaire measures the severity of maltreatment-related ACEs. It was developed by Bernstein and Fink (1998). It contains 28 items rated on a 5-point Likert scale. This questionnaire is the most commonly used instrument for assessing Abuse or neglect in adolescents and adults (Innamorati *et al.* 2016). The CTQ-SF focuses on five main areas of adversity: emotional, physical and sexual abuse, and emotional and physical neglect. The patient rates these domains retrospectively (Liebschutz *et al.* 2018). Each subscale has a possible score range of 5-25. (Bernstein & Fink 1998). The internal consistency of the CTQ factors is high (Bernstein *et al.* 2003). Cronbach's alpha for sexual abuse is 0.93-0.95; emotional neglect 0.88-0.92; emotional abuse 0.84-0.89; physical abuse 0.81-0.86. Test-retest reliability is 0.80 after three months (Adams 2007). Both the original (Bernstein & Fink 1998) and the Czech version (Kaščáková *et al.* 2018) show a good level of psychometric properties.

Tab. 2. Correlations between demographic and clinical variables

	Age	Onset of disorder	Duration of the disorder	CGI-S	BAI	BDI-II	DES	DES-T
Onset of disorder	0.52 S*							
Duration of the disorder	0.31 S*	0.40 S*						
CGI-S	0.00	-0.14 S*	0.07					
BAI	0.01	0.12 S*	0.11 S*	0.49 S*				
BDI-II	0.16 S*	-0.24 S*	0.10	0.43 S*	0.55 P*			
DES	-0.22 S*	-0.25 S*	0.05	0.16 S	0.41 S*	0.48 S*		
DES-T	0.20 S*	-0.28 S*	0.07	0.13 S*	0.38 S*	0.44 S*	0.89 S*	
CTQ	0.01	-0.21 S*	0.20 S*	0.09	0.22 S*	0.31 S*	0.28 S*	0.23 S*
Emotional abuse	-0.10	-0.30 S*	0.22 S*	0.14 S*	0.21 S*	0.37 S*	0.26 S*	0.22 S*
Physical abuse	0.15 S*	-0.07	0.13 S*	0.07	0.18 S	0.17 S*	0.22 S*	0.16 S
Sexual abuse	-0.02	-0.08	0.05	0.09	0.20 S*	0.21 S*	0.24 S*	0.20 S*
Emotional neglect	-0.02	-0.20 S*	0.18 S*	0.08	0.09	0.26 S*	0.16 S	0.15 S*
Physical neglect	0.11	-0.04	0.13 S*	0.00	0.13 S*	0.17 S	0.19 S*	0.15 S*

Explanatory note: S = Spearman r; P = Pearson r; * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$

Statistics

SPSS version 24.0 (SPSS Inc, 2008), G*Power 3 (Faul *et al.* 2007), and Prism (GraphPad PRISM version 5.0; http://www.graphpad.com/prism/prism.htm) were used for statistical analysis. Descriptive statistics were used to analyze means and standard deviations for quantitative, demographic and clinical data. Shapiro-Wilk test was used to check the normality of data distribution.

One-way ANOVA was used to compare multiple groups within the normal distribution of the data. Bonferroni's multiple comparison tests were used as post hoc tests for pairwise comparisons between groups. In a nonparametric distribution, the Kruskal-Wallis test was used. Dunn's multiple comparison test was used as a post hoc test for pairwise comparisons.

Pairs of groups were also analyzed independently of the whole population. Independent sample data were compared using an unpaired t-test or the Mann-Whitney U test (MW) for nonparametric distributions. A paired t-test or Wilcoxon test was used to measure the repeated measures data. Relationships between variables were compared using correlation coefficients (Pearson's for parametric and Spearman's for nonparametric). For all statistical tests, we set a significance level of 5%.

Ethics

The study used the latest version of the Declaration of Helsinki and the ICH-GCP (International Conference on Harmonization, Good Clinical Practice) guidelines (EMEA 2002/2009). All patients signed an informed consent before enrolment after the nature of the procedures had been fully explained. The Ethics Committee of the University Hospital Olomouc approved this project on 14 October 2014 by decision No. 108/14.

RESULTS

Results of the cross-sectional part of the study for the whole population

A total of 357 patients with panic disorder, obsessive-compulsive disorder, or borderline personality disorder who were resistant to previous pharmacological treatment in an outpatient setting were admitted to a 6-week comprehensive inpatient treatment program between November 2015 and June 2022 (Table 1).

Demographic data

The mean age of the patients was 33.2 ± 11.5 years (range 18 to 67 years). The total number of patients was 110 males and 247 females. The mean age of onset of the disorder was 21.5 ± 11.1 years, with a mean duration of 11.1 ± 9.9 years.

The most common medication at baseline was antidepressants (n = 301; 84.3%), followed by antipsychotics (n = 80; 22.4%), antiepileptics (n = 40; 11.2%), and anxiolytics (n = 19; 5.3%). The dosage of medications was within the range of recommended practices for anxiety disorders and obsessive-compulsive disorders (Table 1).

Relationship between demographic and clinical variables

Patients' age statistically significantly positively correlated with the onset of the mental disorder, with its

duration, with the severity of depressive symptoms as assessed by the BDI-II, with pathological dissociation as evaluated by the DES-T, and with childhood physical abuse and physical neglect (Table 2). Therefore, older patients reported later onset of psychiatric disorder, higher severity of depressive symptoms, higher pathological dissociation, and higher levels of childhood physical abuse and physical neglect.

Age at the onset of the disorder statistically significantly negatively correlated with overall disorder severity (CGI-S), anxiety severity (BAI), depression symptoms severity (BDI-II), dissociation severity (DES), and pathological dissociation severity (DES-T), total CTQ-SF score and the Emotional Abuse and Emotional Neglect subscales. In other words, patients with earlier onset psychiatric disorder were more likely to report higher levels of anxiety, depression, and dissociation and also higher Emotional Abuse, Emotional Neglect, and total childhood trauma scores (Table 2).

Duration of the disorder was statistically positively correlated with anxiety severity (BAI), total maltreatment-related ACEs score, and Emotional Abuse, Physical Abuse, Emotional Neglect, and Physical Neglect subscales (CTQ-SF). (Table 2).

Relationship between clinical variables

Scores on the CGI-S scale, assessing the overall severity of the disorder, statistically significantly negatively correlated with the age of onset of the disorder and positively correlated with the severity of symptoms of general anxiety (BAI), symptoms of depression (BDI-II), and the severity of general and pathological dissociation (DES, DES-T). The correlation between the CGI-S scores and the total CTQ-SF score was not statistically significant; however, the positive correlation with the Emotional Abuse subscale was (CTQ-SF) (Table 2).

The severity of anxiety symptoms (BAI) statistically significantly positively correlated with the overall severity of depressive symptoms (BDI-II), dissociation (DES), and the severity of pathological dissociation (DES-T). The BAI score also statistically significantly positively correlated with the total CTQ-SF score and its Emotional Abuse, Physical Abuse, Sexual Abuse, and Physical Neglect subscales (CTQ-SF). (Table 2).

The overall severity of depressive symptoms as assessed by the BDI-II questionnaire statistically significantly negatively correlated with the age of onset of the disorder and positively correlated with patient age, overall disorder severity (CGI-S), overall general anxiety severity (BAI), dissociation severity (DES) and pathological dissociation severity (DES-T). The BDI-II was statistically significantly associated with the total CTQ-SF score and all its subscales (Emotional abuse, Physical abuse, Sexual abuse, Emotional neglect, Physical neglect) (Table 2).

Relationship between childhood trauma and clinical variables

The severity of Emotional abuse (CTQ-SF subscale) was statistically significantly negatively correlated with the age of onset of the disorder. Therefore, patients who reported higher severity of emotional abuse were also more likely to report an earlier onset of the disorder. Emotional abuse was also statistically significantly positively correlated with the duration of the disorder, the overall severity of the disorder (CGI-S), the severity of general anxiety symptomatology (BAI), the severity of depressive symptomatology (BDI-II), the severity of dissociative symptoms (DES) and symptoms of pathological dissociation (DES-T) (Table 2).

The severity of Physical abuse (CTQ-SF subscale) was statistically significantly positively correlated with patient age and duration of the disorder, severity of general anxiety symptomatology (BAI), severity of depressive symptomatology (BDI-II), and severity of dissociative symptoms (DES) and symptoms of pathological dissociation (DES-T) (Table 2).

The severity of Sexual abuse (CTQ-SF subscale) was statistically significantly positively correlated with the severity of general anxiety symptomatology (BAI), the severity of depressive symptomatology (BDI-II), the severity of dissociative symptoms (DES), and symptoms of pathological dissociation (DES-T) (Table 2).

The severity of Emotional neglect (CTQ-SF subscale) was correlated statistically significantly negatively with the age of the disorder onset. It statistically significantly positively correlated with the duration of the disorder, severity of depressive symptomatology (BDI-II), severity of dissociative symptoms (DES), and symptoms of pathological dissociation (DES-T) (Table 2).

The severity of Physical neglect (CTQ-SF subscale) was statistically significantly positively correlated with patient age, duration of the disorder, the severity of general anxiety symptomatology (BAI), the severity of depressive symptomatology (BDI-II), the severity of dissociative symptoms (DES) and symptoms of pathological dissociation (DES-T) (Table 2).

The total score of ACEs as measured by CTQ-SF was statistically significantly negatively correlated with the age of onset of the disorder and positively correlated with duration of the disorder, overall disorder severity (CGI-S), severity of general anxiety symptomatology (BAI), depressive symptomatology (BDI-II), severity of dissociative symptoms (DES), and severity of pathological dissociation (DES-T) (Table 2).

Dissociation and its relationship to clinical variables

The severity of dissociative symptoms was statistically significantly negatively correlated with patient age and onset of disorder development. It positively considerably correlated with overall disorder severity (CGI-S), the severity of general anxiety symptomatology (BAI) and depressive symptomatology (BDI-II) (Table 2).

Tab. 3. Description of data for the diagnosis-specific subgroups - mean scores of demographic and clinical variables of patients included in the study

VARIABLE	PD	OCD	BPD	PD+BPD	PD+OCD	OCD+BPD	STATISTIC
Age	40.3 ± 12.3	35.7 ± 12.1	29.5 ± 10.0	32.9 ± 9.8	34.9 ± 11.3	30.8 ± 9.2	KW test: KW = 44.3; $p < 0.0001$
Age of onset of the disorder	31.2 ± 12.6	17.8 ± 9.2	19.5 ± 9.1	22.8 ± 9.0	19.2 ± 5.9	16.2 ± 8.3	KW test: KW = 63.6; $p < 0.0001$
Duration of the disorder	8.9 ± 9.6	15.5 ± 12.0	9.6 ± 9.3	9.9 ± 9.4	16.2 ± 9.1	13.3 ± 8.6	KW test: KW = 31.8; $p < 0.0001$
CGI-S	4.4 ± 1.1	4,5 ± 1,5	4.2 ± 1.4	4.4 ± 1.0	4.9 ± 1.6	5.0 ± 1.3	KW test: KW = 11.2; ns ($p = 0.051$)
BAI	27.1 ± 13.2	21.1 ± 12.4	24.3 ± 12.8	27.3 ± 13.7	29.1 ± 16.5	28.3 ± 1.2	One-way ANOVA: F = 2.3 df = 354, $p < 0.05$
BDI-II	22.4 ± 10.8	23.1 ± 12.5	32.5 ± 11.9	29.7 ± 11.7	24.6 ± 8.6	33.2 ± 12.0	One-way ANOVA: F = 11.1 df = 354, $p < 0.0001$
DES	14.6 ± 15.7	11.8 ± 11.5	21.4 ± 16.0	24.0 ± 19.9	27.6 ± 28.0	26.9 ± 24.0	KW test: KW = 31.2; $p < 0.0001$
DES-T	10.8 ± 15.4	7.4 ± 10.3	15.3 ± 15.5	18.4 ± 17.7	11.6 ± 4.9	19.2 ± 20.8	KW test: KW = 26.1; $p < 0.0001$
CTQ-SF total score	46.4 ± 17.4	42.6 ± 18.2	54.2 ± 18.0	54.6 ± 18.5	49.9 ± 10.0	56.7 ± 21.2	One-way ANOVA: F = 4.55 df = 354, $p < 0.0005$
Emotional Abuse	10.0 ± 5.0	10.0 ± 4.9	13.8 ± 5.2	13.3 ± 6.4	11.7 ± 4.6	14.6 ± 7.3	KW test: KW = 35.3; $p < 0.0001$
Physical Abuse	7.4 ± 3.7	6.8 ± 3.8	8.4 ± 4.7	9.2 ± 5.5	7.9 ± 3.3	8.4 ± 5.5	KW test: KW = 10.6; ns
Sexual Abuse	6.1 ± 3.5	5.7 ± 3.1	7.0 ± 4.5	6.8 ± 3.1	6.1 ± 2.0	8.6 ± 6.0	KW test: KW = 18.6; $p < 0.005$
Emotional Neglect	14.2 ± 5.8	13.1 ± 5.6	16.3 ± 4.8	15.9 ± 4.9	16.6 ± 4.5	15.8 ± 5.2	One-way ANOVA: F = 3.61 df = 354, $p < 0.005$
Physical Neglect	8.7 ± 3.8	7.4 ± 3.8	9.2 ± 4.1	9.5 ± 3.2	7.7 ± 2.9	9.4 ± 4.3	KW test: KW = 19.4; $p < 0.005$

Explanatory note: BAI = Beck Anxiety Inventory; BDI-II = Beck Depression Inventory, second edition; CGI-S = Clinical Global Impression-Severity; CTQ-SF = Childhood Trauma Questionnaire-Short Form; DES = Dissociative Experience Scale; KW=Kruskal-Wallis test

The severity of pathological dissociative symptomatology as assessed by the DES-T subscale was statistically significantly negatively correlated with the onset of disorder development and positively significantly correlated with age, overall disorder severity (CGI), severity of general anxiety symptomatology (BAI) and depressive symptomatology (BDI-II) (Table 2).

Results for the diagnosis-specific subgroups

Description of baseline data for the diagnosis-specific subgroups

The following table shows the demographic and clinical data divided into diagnosis-specific subgroups based on the most clinically relevant diagnosis and comorbidity (Table 3). The groups included patients with panic disorder (n = 71), obsessive-compulsive disorder (n = 58), borderline personality disorder (n = 146), panic disorder comorbid with borderline personality disorder (n = 36), panic disorder comorbid with obsessive-compulsive disorder (n = 10), and obsessive-compulsive disorder comorbid with borderline personality disorder (n = 36).

Demographic factors for the diagnosis-specific subgroups

The subgroups differed statistically significantly in mean age (Table 3). Dunn's multiple comparison test shows that this significant difference was mainly due to the age difference between PD and BPD patients ($p < 0.001$), with PD patients being significantly older. Other significant differences were between patients with PD and OCD/BPD comorbid patients ($p < 0.01$) and between patients with OCD and patients with BPD ($p < 0.01$).

The subgroups also differed statistically significantly in the disorder's onset age (Table 1). Patients

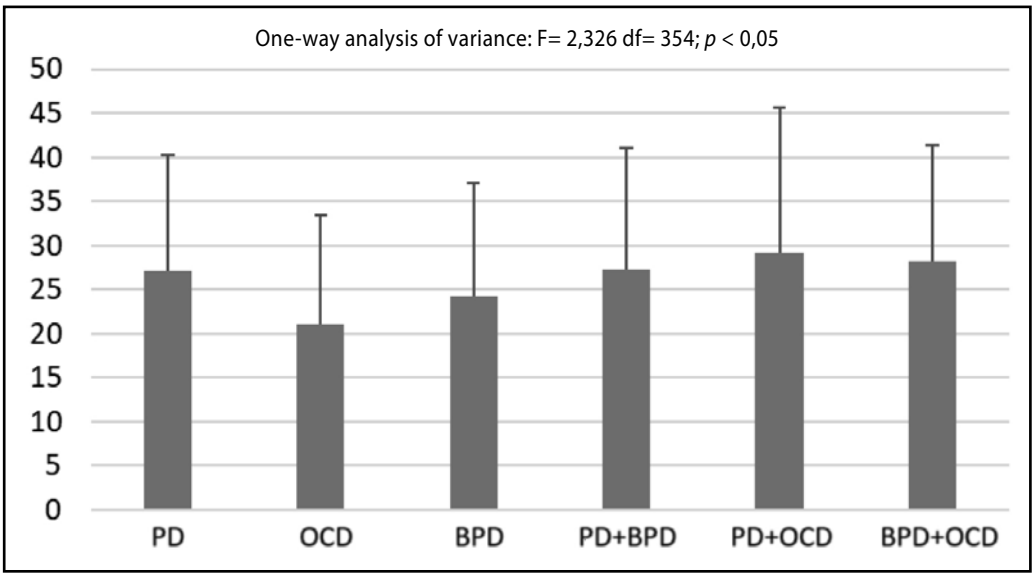

Fig. 1. Baseline BAI scores for different diagnosis-specific subgroups

with PD reported significantly later onset of difficulties compared both to patients with OCD or BPD as individual disorders as well as to OCD/BPD comorbid patients (Dunn's multiple comparison test for all reported relationships: $p < 0.001$).

The duration of the disorder was significantly different for the diagnosis-specific subgroups (Table 3). The described duration was higher in OCD patients, OCD/PD comorbid patients and OCD/BPD comorbid patients compared to the other three subgroups (Dunn's multiple comparison tests: $p < 0.05$).

Baseline rating scale data for the diagnosis-specific subgroups

The overall severity of impairment, as assessed by the CGI, was similar for all diagnostic subgroups (Table 3). The Kruskal-Wallis test, which evaluates all groups simultaneously, showed no significant difference between these groups.

BAI scores were found to be significantly different when the groups were compared by one-way ANOVA. However, the post hoc analysis (Bonferroni multiple comparison test) failed to indicate which diagnosis-specific subgroups differed from the others. It was, therefore, necessary to make separate direct comparisons between the subgroups. As a result, the patients with PD and the subgroups of patients with comorbid disorders were found to have significantly higher anxiety than the patients with OCD (Table 3, Figure 1). Among the results, we describe in more detail those related to hypothesis testing:

- Mean anxiety symptom severity (as assessed by the BAI) was significantly higher in the PD patient subgroup compared to the OCD patient subgroup.

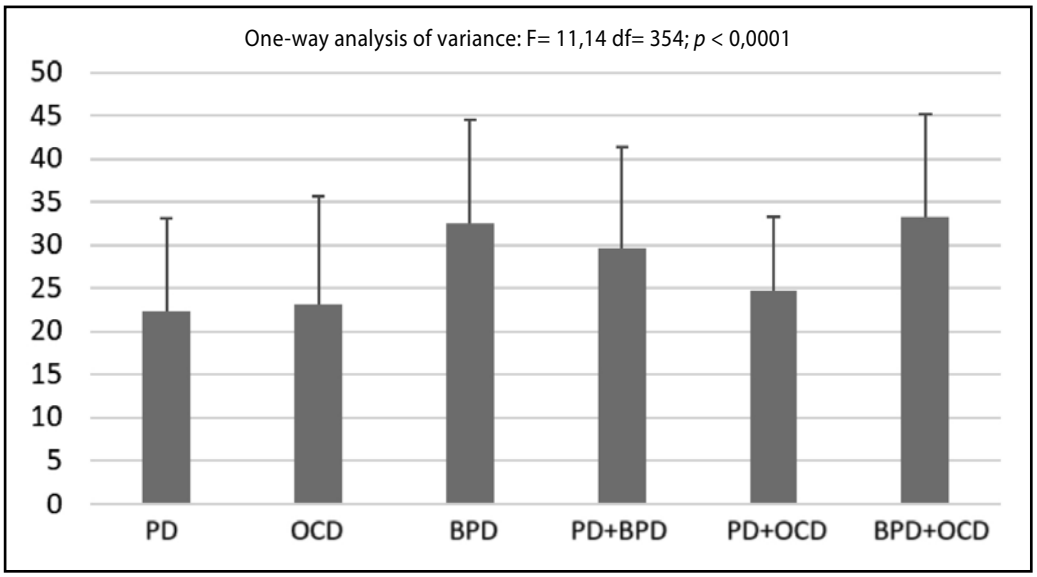

Fig. 2. Baseline BDI-II scores for different diagnosis-specific subgroups

(Mann-Whitney test: Mann-Whitney U = 1440; $p < 0.01$).

- Mean anxiety symptom severity (as assessed by the BAI) was not significantly different between the subgroups of patients with BPD and patients with OCD (Mann-Whitney test: Mann-Whitney U = 3565; ns).

The baseline BDI-II scores significantly differed between the subgroups when compared using one-way ANOVA. (Table 3, Figure 2). Bonferroni's multiple comparison test was performed for a more detailed analysis, which showed statistically significant differences between the PD and BPD subgroups ($p < 0.001$), PD and comorbid PD/BPD subgroups ($p < 0.05$), PD and comorbid BPD/OCD subgroups ($p < 0.001$), and between the OCD and the BPD subgroups ($p < 0.001$). Thus, all subgroups containing patients with BPD appeared to report significantly higher levels of depressive symptoms than the subgroups without BPD patients. Results related to hypotheses are described in more detail:

- Patients with BPD showed significantly higher severity of depression symptoms (as measured by BDI-II) than patients with PD. (unpaired t-test: t = 6.050, df = 216; $p < 0.0001$).
- Patients with BPD showed significantly higher severity of depression symptoms (as measured by BDI-II) than patients with OCD (unpaired t-test: t = 3.949, df = 197; $p < 0.0001$).

Baseline ACE scores for the diagnosis-specific subgroups

Emotional abuse

The baseline mean Emotional abuse CTQ-SF subscale score differed significantly between the diagnosis-specific subgroups (Kruskal-Wallis test: KW = 35.26; $p < 0.0001$). Subsequent posthoc analysis (Dunn's multiple comparison test) showed significant differences mainly between the PD and BPD subgroups ($p < 0.001$), PD and comorbid BPD/OCD subgroups ($p < 0.05$), OCD and BPD subgroups ($p < 0.001$), and between the OCD and comorbid BPD/OCD subgroups ($p < 0.05$). In summary, subgroups of patients with BPD (both as a single diagnosis and as a comorbid diagnosis) had significantly higher Emotional abuse scores on the CTQ-SF compared to the subgroups of patients diagnosed with either PD or OCD as a single diagnosis (Table 3).

Physical abuse

Baseline means Physical abuse subscale scores did not differ significantly between the diagnostic subgroups (Kruskal-Wallis test: KW = 19.62; ns) (Table 3).

Sexual abuse

Baseline mean Sexual abuse subscale scores significantly differed between diagnostic subgroups (Kruskal-Wallis test: KW = 18.64; $p < 0.005$) (Table 3). However, subsequent post-hoc analysis (Dunn's multiple comparison test) did not identify differences between the diagnose-specific subgroups.

Emotional neglect

Baseline mean scores on the Emotional neglect subscale differed significantly between subgroups (one-way ANOVA: F = 3.618, df = 354; $p < 0.005$) (Table 3). Subsequent post-hoc analysis (Bonferroni multiple comparison test) indicated that the difference was primarily between the OCD and BPD subgroups ($p < 0.01$).

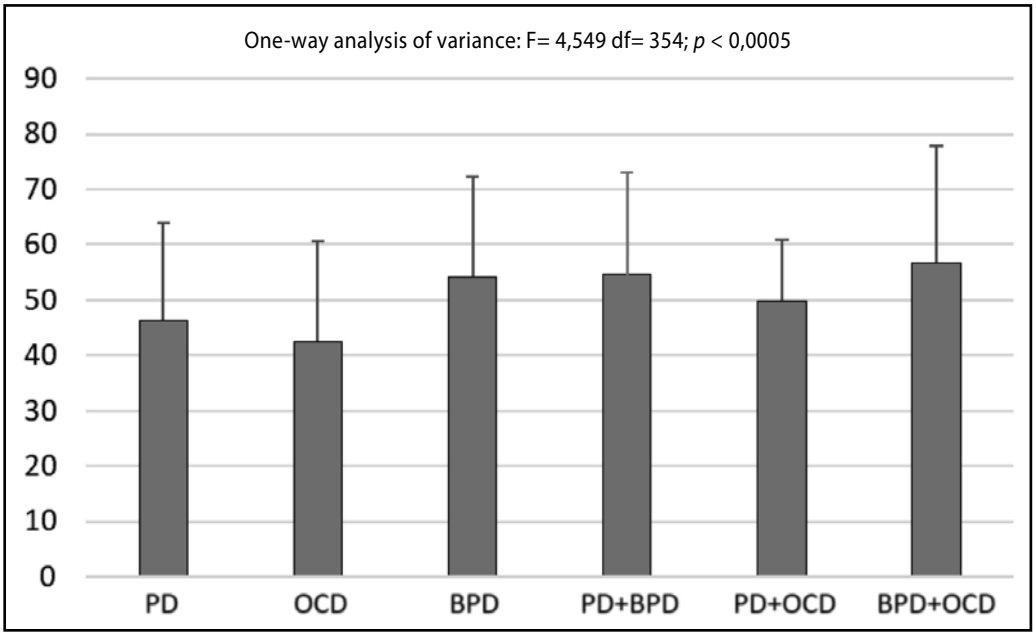

Fig. 3. Baseline total CTQ-SF scores for different diagnosis-specific subgroups

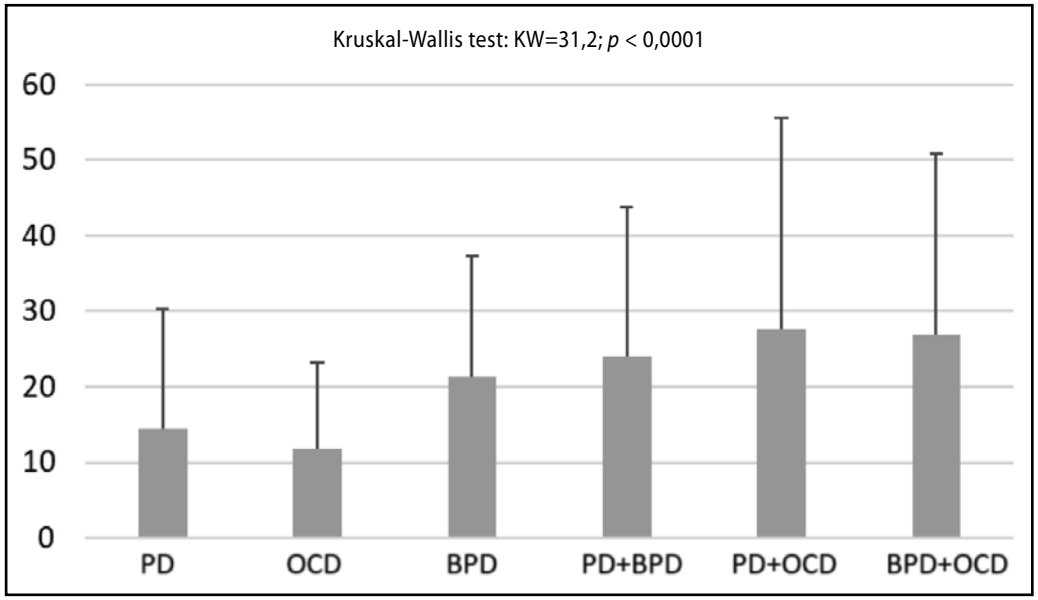

Fig. 4. Baseline DES scores for different diagnosis-specific subgroups

Physical neglect

Baseline mean scores on the Physical neglect subscale differed significantly between diagnostic subgroups (Kruskal-Wallis test: KW = 19.4; $p < 0.005$) (Table 3). Subsequent post-hoc analysis (Dunn's multiple comparison test) showed differences between the OCD and BPD patient subgroups ($p < 0.01$) and between the OCD and comorbid PD/BPD subgroups ($p < 0.01$) (Table 3).

Total CTQ-SF score

Baseline mean total CTQ-SF scores differed significantly between diagnosis-specific subgroups (one-way ANOVA: F = 4.549, df = 354; $p < 0.0005$) (Table 3, Figure 3). Subsequent post-hoc analysis (Bonferroni multiple comparison test) showed the difference mainly between the OCD and BPD subgroups ($p < 0.01$) and between the OCD and comorbid BPD/OCD subgroups ($p < 0.05$).

Additional separate comparisons between subgroups were calculated to test the hypotheses. The results are described below:

- The patients with BPD showed significantly higher total scores for maltreatment-related ACEs (as measured by CTQ-SF total score) compared to the patients with PD (unpaired t-test: t = 2.906, df = 192; $p < 0.005$).
- The patients with BPD showed significantly higher levels of maltreatment-related ACEs (as measured by CTQ-SF total score) compared to the patients with OCD (unpaired t-test: t = 3.784, df = 172; $p < 0.005$).

Baseline dissociation scores for the diagnosis-specific subgroups

Dissociation

Mean dissociation scores (measured by the DES questionnaire) differed significantly between the subgroups (Kruskal-Wallis test: KW = 31.2; $p < 0.0001$) (Table 3, Figure 4). Subsequent posthoc analysis (Dunn's multiple comparison test) showed significant differences in dissociation scores between the PD and BPD subgroups ($p < 0.01$), comorbid PD/OCD and BPD subgroups ($p < 0.05$), OCD and BPD subgroups ($p < 0.001$), OCD and comorbid PD/BPD subgroups ($p < 0.05$), comorbid PD/OCD and PD/BPD subgroups ($p < 0.05$) and also between the OCD and comorbid BPD/OCD subgroups ($p < 0.01$) (Table 3, Figure 4).

Thus, the subgroups of patients diagnosed with BPD (both as a single diagnosis or as a comorbid diagnosis) were shown to have significantly higher rates of dissociation than subgroups of patients diagnosed with PD or OCD only. Interestingly, patients with comorbid PD/OCD reported significantly higher levels of dissociation compared to the subgroups of patients with BPD or comorbid PD/BPD.

Separate analyses were conducted to compare the specific subgroups in line with the proposed hypotheses:

- Mean dissociation scores (assessed by the DES questionnaire) were significantly higher in the patients with BPD compared to the patients with PD (Mann-Whitney test: Mann-Whitney U = 3472; $p < 0.0005$).
- Mean dissociation scores (DES) were significantly higher in the patients with BPD compared to the patients with OCD (Mann-Whitney test: Mann-Whitney U = 2293; $p < 0.0001$).

Pathological dissociation

Mean pathological dissociation scores (measured by the DES-T subscale) differed significantly between diagnosis-specific subgroups (Kruskal-Wallis test: KW = 26.13; $p < 0.0001$) (Table 3, Figure 5). Subsequent post hoc analysis (Dunn's multiple comparison test) indicated that the result was explained by the difference between the pathological dissociation scores

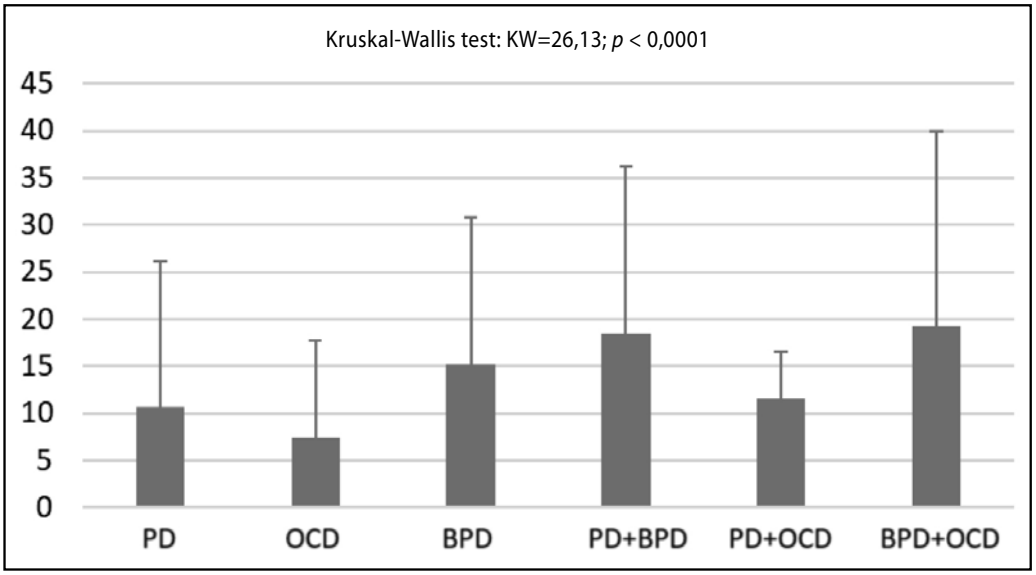

Fig. 5. Baseline DES-T for different diagnosis-specific subgroups

of the PD and BPD subgroups ($p < 0.05$), OCD and BPD subgroups ($p < 0.01$), OCD and comorbid PD/BPD subgroups ($p < 0.05$), and OCD and comorbid BPD/OCD subgroups ($p < 0.05$) (Table 3, Figure 5).
Separate subgroups of patients were compared according to the postulated hypotheses:

- Mean pathological dissociation scores (measured by the DES-T subscale) differed statistically significantly between the patients with PD and patients with BPD (Mann-Whitney test: Mann-Whitney U = 3558; $p < 0.005$).
- Mean pathological dissociation scores (DES-T) differed statistically significantly between the patients with OCD and patients with BPD (Mann-Whitney test: Mann-Whitney U = 2328; $p < 0.0001$).

DISCUSSION

The results provide important insight into the relationship between dissociation and clinical variables across psychiatric diagnoses. The severity of dissociative symptoms was shown to correlate negatively with patients' age and age of onset of the disorder and positively with the total severity of the disorder and anxiety and depressive symptoms. These findings suggest that dissociation may be an important factor influencing the clinical presentation of these mental disorders.

A more detailed analysis displayed that BPD patients had higher rates of dissociation than patients with PD or OCD. This result is consistent with previous studies that have shown that dissociation is more severe in patients with borderline personality disorder compared to these disorders (Lyssenko *et al.* 2018). This could be explained by more severe childhood traumatic experiences in this group (Schulze *et al.* 2024). Some authors suggest that the association between childhood trauma and dissociation might be mediated by other factors, such as mentalization (Wagner-Skacel *et al.* 2022). We did not explore this association in our study.

Another important finding is that the BPD patients show more severe childhood trauma compared to the PD and OCD patients. Moreover, a subgroup of patients with BPD and another comorbid disorder reported higher rates of dissociation and more severe clinical presentation than patients with a single diagnosis in our study. This suggests that comorbidity may exacerbate the course and severity of psychiatric disorders, which is important to consider when diagnosing and treating these patients.

Discussion of hypotheses

1. Dissociation:

(1a) Patients with BPD show more severe dissociation than patients with PD. The results of our study support this hypothesis. BPD patients showed significantly higher levels of dissociation compared to patients with PD. This finding is consistent with the literature, which reports that dissociation is more common in patients with borderline personality disorder, likely due to higher rates of childhood traumatic experiences (Lyssenko *et al.* 2018; Kolek *et al.* 2019; Holubova *et al.* 2021; Schulze *et al.* 2024).

(1b) Patients with BPD show more severe dissociation than patients with OCD. This hypothesis has also been confirmed. Patients with BPD showed higher levels of dissociation than patients with OCD. This finding supports previous studies showing that dissociation tends to be more common in patients with BPD (Lyssenko *et al.* 2018).

2. Symptoms of depression:

(2a) Patients with BPD show more severe depressive symptoms than patients with OCD. Our results

support this hypothesis. Patients with BPD showed more severe depressive symptoms compared to patients with OCD. This finding is consistent with the literature that depression is more common and more persistent in patients with BPD (Shah & Zanarini 2018; Ruscio *et al.* 2010).

(2b) Patients with BPD show more severe depressive symptoms than patients with PD. This hypothesis has also been confirmed. Patients with BPD showed higher rates of depressive symptoms than patients with PD. This finding is linked with previous studies showing that depression is a significant factor in patients with BPD (Shah and Zanarini 2018; Kessler *et al.* 2005).

3. Symptoms of anxiety:
(3a) Patients with PD show more severe anxiety than patients with OCD. The study results did not support this hypothesis. The subgroup of patients with PD did not show significantly higher levels of anxiety than the subgroup of patients with OCD. This finding suggests that anxiety may be equally severe in both groups of patients.

(3b) Patients with BPD show more severe anxiety than patients with OCD. This hypothesis was confirmed. Patients with BPD showed higher levels of anxiety compared to patients with OCD. This finding is consistent with the literature, which reports that anxiety is higher in patients with BPD (Shah and Zanarini 2018; Ruscio *et al.* 2010).

4. Childhood trauma:
(4a) Patients with BPD show more severe childhood trauma than patients with PD. The hypothesis has been confirmed. Patients with BPD showed more severe childhood trauma compared to patients with PD. In conjunction with the conclusions of hypothesis 1a (dissociation is more severe in patients with BPD than in patients with PD), this finding supports the premise that traumatic experiences in childhood may play a key role in the development of dissociative symptoms (Wagner-Skacel *et al.* 2022).

(4b) Patients with BPD show more severe childhood trauma compared to patients with OCD. This hypothesis has also been confirmed. Patients with BPD showed more severe childhood trauma than patients with OCD. This finding is consistent with the literature, which reports that traumatic childhood experiences are more common in patients with BPD (Bozzatello *et al.* 2021).

Limitations of the study

Sample size: One of the major limitations of this investigation study is the relatively small sample size in each diagnosis-specific subgroup. Small sample sizes may limit the analyses' power and the outcomes' generalizability to a larger population.

Cross-sectional design: The study uses a cross-sectional design, meaning that data were collected simultaneously. This design does not allow for tracking changes over time and limits the ability to determine causal relationships between variables.

Self-report questionnaires: Using self-reporting questionnaires such as the DES and CTQ-SF can be influenced by subjective factors such as memory bias or social desirability. This may lead to underestimation or overestimation of the severity of symptoms and events.

Comorbidity: Although we have accounted for comorbidities in the study design, additional comorbid conditions may affect the results and interpretation of the data. Analysis and interpretation of results may be complicated because patients with multiple diagnoses may have different patterns of symptoms and responses to treatment.

Clinical setting: The study was conducted in a specific clinical setting, which may limit the generalizability of the results to other clinical or non-clinical populations.

CONCLUSIONS

This study provides new insights into the relationship between dissociation, childhood traumatic experiences, and clinical variables in patients with PD, OCD, or BPD. These findings may contribute to a better understanding of dissociative symptoms in psychiatric disorders, leading to personalized and enhanced treatment.

DISCLOSURE

The authors report no conflicts of interest in this work.

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