Affect regulation and psychopathology in women with borderline personality disorder

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ABSTRACT

INTRODUCTION: Dysfunction in affect regulation is a prominent feature that grossly impairs behavioural and interpersonal domains of experience and underlies a great deal of the psychopathology in borderline personality disorder (BPD). However, no study has yet been published that evaluates the psychometric properties of the translated Danish version of self-report measures sensitive to the different aspects and dimensions of dysfunction in affect regulation prevalent in BPD.

MATERIAL AND METHODS: This study comprised a group of women diagnosed with BPD (n = 29) and a comparison group of healthy subjects (n = 29) who reported psychopathology and levels of affective instability, aggression, impulsivity and alexithymia by self-report measures.

RESULTS: Our results demonstrated that women with BPD have significant psychopathology and report significantly higher levels of dysfunction in separate components of affect regulation by self-report measures than the comparison group of healthy subjects. Our results also provided partial support for the psychometric appropriateness and clinical relevance of the translated Danish version of affect regulation measures.

CONCLUSION: The normative reference range indicated by our results makes the measures useful as a practical assessment tool.

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Borderline personality disorder (BPD) is a debilitating mental illness defined by a complex set of symptoms that afflict approximately 1-2% of individuals in the general population and up to 20% of those who undergo inpatient treatment [1]. Dysfunction in affect regulation is a prominent feature that grossly impairs behavioural and interpersonal domains of experience and underlies a great deal of the psychopathology in BPD [2]. This dysfunction is mainly characterized by a high sensitivity to emotional stimuli, heightened emotional intensity and slow return to emotional baseline once emotional arousal has occurred. Efforts to minimize the negative moods and feeling states that would inevitably arise from such dysfunction elicit a range of desperate escape maneuvers, including impulsive or self-destructive actions [3].

The inability to control and modulate one's affective state to such a degree that emotions get out of control and override judgment and reason has been established as the core feature of BPD [2]. Specifically, extreme levels of affective instability, impulsivity or a combination [4] of these traits have been considered to substantially contribute to the range of symptoms associated with BPD. A combination of extreme impulsivity and aggression has similarly been considered an identifying trait of BPD [5], even to the extent that there may be genetic correlates [6]. This further suggests that there may be a link between the psychometric measures of affect regulation and the neurobiological measures in BPD irrespective of the heterogeneity and complexity of diagnostic criteria.

For the purposes of our study, we distributed Danish translations of self-report measures of affective instability, aggression, impulsivity and alexithymia (deficiency in understanding, processing or describing emotions) to BPD patients and healthy controls. The psychometric properties and clinical relevance of these translations had not previously been evaluated. We hypothesized that women with BPD would report significant psychopathology and suffer from higher levels of affective dysregulation on self-report measures than a comparison group of healthy subjects. We also hypothesized that the psychometric properties of the Danish version of affect regulation measures would be reliable and correspond to previous research.

MATERIAL AND METHODS

Subjects

Patients were recruited via four outpatient clinics in the Zealand Region and the Danish BPD association. Patients were eligible for inclusion if they met the Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV [7] diagnostic criteria for BPD and were women aged 18-45 years. The exclusion criteria were somatic or neurological illnesses and co-morbidity of severe psychiatric disorders.

A total of 33 patients were recruited and assessed. Results from 29 of these patients were included. The reasons for exclusion were drug abuse (n = 1), somatic illness (n = 1), failure to meet diagnostic criteria for BPD (n = 1) and incomplete questionnaire (n = 1).

ABBREVIATIONS

ALS = The Affective Lability Scale
BIS-11 = Barratt Impulsiveness Scale – 11
BPAQ = Buss-Perry Aggression Questionnaire
BPD = borderline personality disorder
DSM = Diagnostic and Statistical Manual of Mental Disorders
MINI = Mini International Neuropsychiatric Interview
SCID-II = Structured Clinical Interview for DSM-IV Axis II Personality Disorders
SCL-90-R = Symptom Check List – 90
SD = standard deviation
TAS-20 = Toronto Alexithymia Scale – 20

Twenty-nine healthy controls matched one-to-one with patients on age and gender were recruited from the community. Exclusion criteria for controls were the presence of a psychiatric diagnosis, somatic or neurological illnesses and psychiatric diagnoses in first-degree relatives.

Procedure

After obtaining written informed consent from the subject and recording her background characteristics, the subject underwent assessment for psychopathology and affect regulation. Psychiatric interviews were conducted to examine DSM-IV Axis I and II disorders, and self-report scales were administered to assess general psychopathology and affect regulation.

Measures

The following measures were employed: The Mini International Neuropsychiatric Interview (MINI), which is an abbreviated and structured psychiatric interview that assesses the 15 major adult Axis I diagnostic categories of the DSM-IV [8]. The Structured Clinical Interview for the DSM-IV Axis II Personality Disorders (SCID-II), which identifies all DSM-IV personality disorders according to diagnostic criteria [9]. The Symptom Check List – 90 – Revised, a widely used self-report instrument [10] that includes nine subscales targeting specific domains of psychopathology as well as global severity. The Affective Lability Scale (ALS), which is a 54-item instrument [11] in which subjects rate their agreement with statements regarding the tendency of their mood to shift. The Barratt Impulsiveness Scale – 11 (BIS-11), which is a 30-item self-report questionnaire [12] designed to assess general impulsiveness. The Buss-Perry Aggression Questionnaire (BPAQ), a 29-item questionnaire aimed at measuring attitudes towards aggressiveness and its expression in everyday circumstances [13]; and, finally, the Toronto Alexithymia Scale – 20 (TAS-20), a self-report questionnaire designed to assess an individual's level of alexithymia, i.e. the inability to read emotions [14, 15].

Statistical analysis

Data were analysed using the Statistical Package for the Social Sciences (SPSS), version 19.0. Initial analysis revealed that scale scores were partially non-normally distributed; thus, nonparametric statistics were used to assess differences between patients and controls (Mann-Whitney U test). To quantify the difference between patients and controls, effect size was calculated by standardizing data to z-scores using the healthy control group data as a reference. To compare the demographic characteristics of the patient and control groups, independent samples t-tests and Pearson's χ^2-test were used. All analyses used two-tailed levels of significance. Bonferroni corrections were employed to reduce Type I errors. Cronbach's alpha coefficient was used to test the internal consistency reliability of the different scales and subscales, contrasting patients and controls to compare similarity of results.

Trial registration: not relevant.

RESULTS

Demographics

There was no significant age difference (p = 0.52) between patients (range 19.2-40.7 years; mean = 25.55 years; standard deviation (SD) = 6.3) and healthy controls (range 19.3-38.7 years; mean = 24.59 years; SD = 5.9) (see **Table 1**). Despite recruitment efforts, there was a highly significant difference between the socioeconomic status of patients and controls (χ^2 = 7.22; p = 0.008). There was also a highly significant difference in educational level (p < 0.001) between patients (range 9-16.5 years; mean = 11.43 years; SD = 2.2) and healthy controls (range 10-17 years; mean = 13.53; SD = 1.9).

Affect regulation

Patients scored significantly higher than controls (p < 0.001) on all subscales and total scores of the ALS, BIS-11, BPAQ and TAS-20 (see **Table 2**), except for the BPAQ

TABLE 1

Demographics.

	Patients (n = 29)		Controls (n = 29)		
Descriptives	**mean**	**SD**	**mean**	**SD**	**Significance levels**
Age, years	25.55	6.29	24.59	4.93	p = 0.52
Years of education	11.43	2.17	13.53	1.95	p < 0.001
Socioeconomic status[a], n					χ^2 = 7.22, p = 0.008
High	6		15		
Middle	14		11		
Low	9		3		

χ^2 = Pearson's chi-square; SD = standard deviation.
a) Socioeconomic status was calculated from a combined rating of the highest parental education or occupation and household income.

subscale of verbal aggression (p = 0.26). These results remained unchanged after Bonferroni correction. The effect size of the total score for the ALS was 4.97; the effect sizes of the subscales ranged from 8.76 to 1.73. The effect size of the total score for the BIS-11 was 2.22; the effect sizes of the subscales ranged from 2.79 to 1.26. The effect size of the total score for the BPAQ was 5.33; the effect sizes of the subscales ranged from 7.00 to 0.41. The effect size of the total score for the TAS-20 was 3.62; the effect sizes of the subscales ranged from 6.08 to 1.34. The internal consistency of affect regulation scales and subscales was examined by computing Cronbach's coefficient alpha. Patients and controls were contrasted to compare the similarity of the results.

While patients in general had reliable subscale and total score coefficient alphas (above 0.7) on the various scales, the controls had coefficients below 0.7 on approximately half of the scales, most notably a 0.28 coefficient on the total score of the BPAQ.

General psychopathology

Patients scored significantly higher than controls (p < 0.001) on all subscales and the global severity index of the SCL-90-R than the matched controls, also after Bonferroni correction (see Table 2). The range of effect sizes of the subscales was from 24.37 to 3.50, and the global severity index had an effect size of 9.37. The mean rating across all items, i.e. the global severity index, was

TABLE 2

Affect regulation and psychopathology.

	Patients (n = 29)			Controls (n = 29)			Cronbach's alpha		
	mean (range)	median	SD	mean (range)	median	SD	patients	controls	Z
ALS									
Labile anger	13.17 (0-21)	15	6.11	1.00 (0-5)	0	1.39	0.90	0.37	8.76***
Labile depression	19.72 (10-28)	21	4.74	4.00 (0-12)	4	3.27	0.65	0.67	4.80***
Labile elation	17.97 (2-32)	20	8.26	6.48 (0-23)	4	6.63	0.87	0.89	1.73***
Labile anxiety	13.97 (6-23)	14	4.57	1.79 (0-8)	1	2.35	0.70	0.67	5.17***
Depression/elation oscillation	17.28 (6-27)	18	5.81	3.97 (0-12)	3	3.09	0.80	0.67	4.31***
Depression/anxiety oscillation	17.17 (5-24)	18	4.89	1.41 (0-8)	0	2.23	0.79	0.80	7.07***
Total score	99.28 (40-147)	106	27.76	18.66 (1-61)	15	16.21	0.88	0.85	4.97***
BIS-11									
Attentional impulsiveness	20.90 (15-30)	21	3.81	12.66 (9-20)	12	2.96	0.62	0.67	2.79***
Motor impulsiveness	25.48 (15-34)	25	5.08	20.34 (12-32)	20	4.09	0.64	0.71	1.26***
Nonplanning impulsiveness	29.14 (17-39)	30	5.95	23.55 (15-31)	24	4.09	0.74	0.57	1.36***
Total score	75.52 (52-98)	76	11.11	56.55 (40-78)	57	8.55	0.58	0.63	2.22***
BPAQ									
Physical aggression	19.34 (9-35)	16	7.73	12.59 (9-19)	12	2.98	0.82	0.52	2.27***
Verbal aggression	12.21 (5-25)	12	4.51	10.79 (5-19)	11	3.44	0.77	0.75	0.41
Anger	22.90 (9-35)	24	6.65	11.17 (8-24)	10	3.14	0.82	0.71	3.73***
Hostility	26.79 (13-40)	26	6.55	10.69 (8-17)	10	2.30	0.72	0.45	7.00***
Total score	81.24 (47-110)	84	18.86	45.24 (34-60)	45	6.75	0.71	0.28	5.33***
TAS-20									
Difficulty identifying feelings	23.07 (12-35)	22	5.06	9.03 (7-16)	8	2.31	0.72	0.59	6.08***
Difficulty describing feelings	17.79 (8-25)	19	4.62	8.76 (5-21)	8	4.09	0.76	0.84	2.21***
Externally oriented thinking	21.10 (10-23)	20	4.72	15.66 (9-27)	15	4.07	0.40	0.59	1.34***
Total score	61.97 (34-85)	63	11.51	33.45 (21-51)	32	7.88	0.83	0.78	3.62***
SCL-90-R									
Somatization	14.45 (2-40)	13	8.87	3.17 (0-13)	2	3.22	0.86	0.72	3.50***
Obsessive-compulsive	19.97 (4-37)	20	7.95	3.69 (0-13)	2	3.81	0.71	0.68	4.27***
Interpersonal insensitivity	20.69 (4-35)	21	7.02	1.24 (0-5)	0	1.57	0.77	0.28	12.36***
Depression	29.24 (3-49)	30	11.43	3.66 (0-15)	3	3.54	0.89	0.73	7.23***
Anxiety	16.48 (1-38)	16	8.53	1.79 (0-9)	1	1.99	0.85	0.54	7.38***
Hostility	8.14 (0-18)	8	5.33	0.69 (0-3)	0	0.85	0.79	0.02	8.77***
Phobic anxiety	7.66 (0-20)	7	5.34	0.10 (0-1)	0	0.31	0.72	–0.06	24.37***
Paranoid ideation	9.97 (0-24)	8	6.45	0.21 (0-2)	0	0.49	0.86	0.20	20.29***
Psychoticism	12.28 (0-31)	12	8.01	0.28 (0-2)	0	0.59	0.82	0.26	4.56***
Global severity index	152.28 (31-315)	147	60.64	17.00 (3-68)	14	13.90	0.93	0.82	9.73***

ALS = The Affective Lability Scale; BIS-11 = Barratt Impulsiveness Scale – 11; BPAQ = Buss-Perry Aggression Questionnaire; SCL-90-R = Symptom Check List – 90; SD = standard deviation; TAS-20 = Toronto Alexithymia Scale – 20.
***) p < 0.001.

Efforts to minimize the negative moods and feeling states that arise from dysfunction in affect regulation elicit a range of desperate escape maneuvers, including impulsive or self-destructive actions.

1.69 for patients (0.19 for controls), which indicates severe general psychopathology in BPD. The two samples were very different in coefficient alpha on some of the scales. While patients had reliable subscale and total score coefficients from 0.71 to 0.93, controls had coefficients from as low as –0.06 to 0.82.

DISCUSSION

Our data demonstrate that women with BPD have significant psychopathology and suffer from significantly higher levels of affective instability, aggression, impulsivity and alexithymia on self-report measures than healthy subjects. No significant difference between the groups was found only on a single measure, the BPAQ verbal aggression subscale. The variance of the effect sizes that were not confounded by a floor effect, i.e. some scales (ALS and SCL-90-R) only had utility as a measure of severe psychopathology, ranged from 0.41 and up to approximately 7.00. This indicates that there is considerable and severe dysfunction in affect regulation in women with BPD, and it also indicates heterogeneity with regard to types of dysfunction as measured in terms of both between scale and *within scale* variation. A comparison of the effect size of the various scales shows that the greatest dysfunction appears to be aggression, followed by the dysfunctions of affect instability, alexithymia and impulsivity. The accuracy and consistency with which the various affect regulation scales and subscales measured their intended construct generally appeared to be reliable within patients. However, the BIS-11 had coefficients just below acceptable levels as had the TAS-20 externally oriented thinking subscale and the ALS labile depression subscale. The reliability of affect regulation constructs within the control group, however, appeared to be low. Only half of the measures had acceptable coefficients, but this is likely because the scales were designed only to indicate severe dysregulation.

We hypothesized that the psychometric properties of the translated Danish version of affect regulation measures would correspond to previous research. By comparing findings from studies that used the original English versions and had a design similar to ours in terms of the inclusion of BPD patients and a healthy control group, we found support for a reasonable degree of equivalence in psychometric properties. Koenigsberg et al [4] found that BPD patients scored significantly higher than patients with other personality disorders on three ALS subscale measures, indicating discriminatory power. Their results show a reasonable similarity to ours. In a study by McCloskey et al [16], BPD subjects reported higher levels of aggression and impulsivity on the BPAQ and BIS-11 than (non-cluster B) personality disorders and healthy volunteers. There was a very strong similarity between the results of their patients and our BPD patient on BPAQ anger and hostility subscales, as well as on all BIS-11 patient results. A comparison of the healthy control groups appears to suggest the same, although our BPAQ subscales appear to have relatively elevated levels, which may be due to differences in sample characteristics. New et al [17] found a slightly less pronounced impairment of BPD patients on the TAS-20 than we did; however, their control results were nearly identical to ours. As the only included affect regulation measure, the TAS-20 uses cut-off scoring [17]. If the total score is equal to or greater than 61, the trait of alexithymia is considered pathological. Considering a mean patient score of 61.97 and that 19 out of our 29 patients scored equal to or above 61, and that no healthy control scored more than 51, alexithymia must be a core feature of the psychopathology of BPD. This was corroborated by Guttman and Laporte [18] who found an association between high levels of alexithymia in women with BPD and general emotional distress as measured by the SCL-90-R. The same association ($r = 0.39$, $p = 0.039$) was found in our study.

The psychometric comparisons that have been conducted [19] suggest that the different language versions share the same psychometric properties and thus measure the same constructs. This implies that the measures may have a discriminant function in predicting a diagnosis of BPD [4] and act as clinical reference points in the

treatment of specific aspects of BPD symptoms. The importance of assessing levels of dysfunction in affect regulation also extends to other disorders in which similar dysfunctions drive symptoms [20].

The main strength of our study was that the included measures appear empirically equivalent to the original English versions and this may be considered preliminary evidence of reliability, which was also apparent from examining the internal consistency of measures in the patient group. Other strengths were the inclusion of a relatively homogeneous patient sample of BPD patients at an age where symptoms would be most florid and of a matched control group to indicate normative values as well as the order of magnitude in differences between patient and control responses on our included measures.

There were some limitations in our study. One was the significant difference in sociodemographic characteristics between patients and controls despite initial attempts to avoid such differences. Another limitation was the relatively small sample size that made statistical validation impossible and limited our capability to investigate any association between the included measures.

CONCLUSION

In summary, our results demonstrated that women with BPD have significant psychopathology and endorse significantly higher levels of dysfunction in separate components of affect regulation on self-report measures than a comparison group of healthy subjects. Our results also provided partial support for the psychometric appropriateness of the translated Danish translation of affect regulation measures. The normative reference range indicated by our results makes the measures useful as practical assessment tools. Further studies should explore the psychometric properties of the measures with different, large(r) groups of psychiatric patients in order to test diagnostic and treatment utility.

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CONFLICTS OF INTEREST: none

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