



## Post-traumatic stress disorder and the outcome of dialectical behaviour therapy for borderline personality disorder

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### ABSTRACT

**Background** – Individuals with borderline personality disorder (BPD) and comorbid post-traumatic stress disorder (PTSD) have a worse prognosis than individuals with BPD alone. A common view is that the emotional instability and impulsivity of BPD should be treated before attempting to address trauma. However, PTSD symptoms may interfere with patients' ability to benefit from such 'stabilizing' treatments.

**Methods** – The effect of BPD–PTSD comorbidity on self-harm and BPD symptom outcomes was evaluated in 89 patients receiving dialectical behaviour therapy, using multilevel modelling.

**Results** – Patients with comorbid BPD–PTSD showed a trend towards elevated BPD symptoms throughout the treatment year ( $\beta = 2.12$ , 95% CI =  $-0.21$ – $4.44$ ,  $p = 0.07$ ). There was a three-way interaction between PTSD comorbidity, treatment completion and time, whereby PTSD comorbidity was associated with less reduction in self-harm frequency over time, but only in those completing the full 12 months of treatment (incident risk ratio = 1.16, 95% CI = 1.04–1.30,  $p < 0.01$ ).

**Conclusion** – Patients with comorbid PTSD had a poorer outcome from dialectical behaviour therapy than those with BPD alone, possibly because of the negative impact of unaddressed trauma. The results provide further grounds for recently developed treatments targeting BPD traits and PTSD symptoms simultaneously. Copyright © 2013 John Wiley & Sons, Ltd.

Borderline personality disorder (BPD) is associated with a high prevalence of childhood trauma, especially trauma relating to abuse and neglect (Zanarini et al., 1997). Relatedly, there is a high comorbidity between BPD and post-traumatic stress disorder (PTSD). Fifty-eight percent of inpatients and 25% of outpatients with BPD also meet diagnostic criteria for PTSD (Golier et al., 2010; Zanarini et al., 2011)—twice as many as patients with other types of personality disorder. Patients with comorbid BPD–PTSD are hospitalized more frequently than patients with BPD alone (Zlotnick

et al., 2003) and are less likely to achieve remission from BPD (Zanarini et al., 2006). They also have a poorer quality of life, greater emotional dysregulation, more comorbidity with other Axis I conditions such as major depression, higher rates of non-suicidal self-harm and higher lifetime odds of making a suicide attempt (Harned et al., 2010a; Pagura et al., 2010).

Since the early 1990s, increasing numbers of new psychotherapy models have been developed, which are designed specifically for the treatment of BPD. Of these interventions, the most

frequently evaluated has been dialectical behaviour therapy (DBT). A recent Cochrane review and meta-analysis concluded that DBT is significantly more effective than treatment as usual at reducing self-harm in patients with BPD (Stoffers et al., 2012).

A common aspect of many of these recently developed treatments for BPD is that they are present focused rather than past or trauma focused. For instance, Stage 1 DBT is focused on reducing current suicidal, therapy-interfering and quality-of-life-interfering behaviours (Linehan, 1993a), whilst mentalization-based therapy focuses on current mental states (Bateman & Fonagy, 2006), and transference-focused psychotherapy focuses on interpreting the transference relationship here and now (Clarkin et al., 1999). This focus on the present may relate to the commonly held view that addressing past trauma directly can trigger extreme suicidal or parasuicidal crises in individuals with BPD (Foa et al., 2009; Jacob & Lieb, 2007). On this basis, Linehan (1993a,1993b) argued in the DBT treatment manual that extensive reprocessing of trauma should not be carried out with patients with BPD until they have been taught skills to regulate their emotional responding and bring self-harming behaviour under control. This is the focus of Stage 1 DBT, and hence, trauma exposure work is not conducted at this stage, although Linehan (1993a,1993b) does suggest that some of the sequelae of trauma in the present, such as nightmares or feelings of self-blame, should be addressed.

However, in the last few years, clinical researchers are increasingly moving towards developing treatments that use trauma exposure work to target both BPD and PTSD concurrently, without the need for prior 'stabilizing' treatments (Harned et al., 2012; Steil et al., 2011; Tetley et al., 2012). Possibly, this shift in focus reflects a growing appreciation that current treatments for BPD are not adequately addressing the needs of those with comorbid PTSD. In support of this, a recent study showed that, by the end of Stage 1 DBT, 32% of BPD-PTSD patients had not achieved the reduction in self-harm and suicide risk thought necessary to move on to trauma work (Harned et al.,

2010b), and participants were increasingly unlikely to achieve this with increasing PTSD severity. It has also been found that patients with comorbid PTSD are more likely to drop out of psychotherapy for BPD (Nysaeter et al., 2010). The effect of PTSD on BPD treatment outcome may therefore interact with treatment completion.

The present research aimed to test the hypothesis that patients with comorbid BPD and PTSD have poorer outcomes from Stage 1 DBT than patients with BPD alone. The research evaluated the influence of PTSD comorbidity on the outcome of DBT for BPD in a community service. In particular, the research assessed the impact of PTSD on self-harm frequency, BPD symptom severity and changes in these variables over time, and how this interacted with treatment completion.

## Method

### Design

This was a prospective longitudinal study in a cohort of participants receiving DBT for BPD with self-harm.

### Inclusion and exclusion criteria

Participants were included if they

- (1) had a diagnosis of BPD,
- (2) had at least one day with self-harm in the 12 months prior to recruitment and
- (3) received at least one session of DBT at Newham DBT Service.

The only exclusion criterion was learning or English language difficulties of sufficient severity to prevent participation in DBT skills teaching groups.

### Newham DBT Service

Newham DBT Service was initiated in 2003 and is a multidisciplinary team including psychiatrists, social workers and psychiatric nurses, all of whom have received training from Behavior Tech USA

as dialectical behaviour therapists and some of whom receive regular supervision from Behavioral Tech trainers. The service offers a 12-month course of DBT, including an hour of individual therapy each week, 2 hours of group skills training each week and out-of-hours telephone skills coaching. Between March 2008 and May 2011, individual treatment and group skills training sessions were recorded, and 10% of the available recordings were assessed for adherence to the DBT model by a trained adherence rater Amy Gaglia using a 63-item rating scale. Both group and individual sessions were found to be adherent to the DBT model (Priebe et al., 2012).

Referrals are accepted from primary, secondary and tertiary mental health services in the East London Borough of Newham. If participants miss four consecutive treatment sessions (group and/or individual), they are discharged. Participants who are discharged before completing the full 12 months of DBT are referred back to the service that referred them to DBT, and may then receive treatment from that service or be referred on elsewhere.

### *Procedure*

All participants were recruited via the Newham DBT service between March 2008 and March 2011. Participants recruited between March 2008 and May 2010 were recruited as part of a randomized controlled trial of DBT vs treatment as usual, the methods and findings for which are published in Priebe et al. (in press 2012). Whilst recruitment to the trial finished in May 2010, participants for the present study continued to be recruited until March 2011. The recruitment of participants into the present study is summarized in Figure 1.

Newham DBT team assessed eligibility for the present study, following which researchers obtained informed consent, conducted a baseline interview and then arranged to interview participants every 2 months for a year to collect outcome data. Interviews were conducted in person, either at the research department, the treatment centre, hospital if the participant had been hospitalized

or the participant's home. Where this was not possible, interviews were conducted by phone, or in a few cases, self-report measures were sent by post to the participants. Every effort was made to continue to follow up participants who dropped out of DBT before completing the full course.

## **Measures**

### *Baseline measures*

Participants' Axis I diagnoses, including PTSD, were assessed using the Mini International Neuropsychiatric Interview (MINI) (Sheehan et al., 1998). This DSM-IV-based structured interview has been shown to have good inter-rater and test-retest reliability (Lecrubier et al., 1997; Sheehan et al., 1997).

Participants' Axis II diagnoses were assessed using the Structured Clinical Interview for DSM-IV, Axis II (First et al., 1997), to ascertain that they met criteria for BPD and to document their personality disorder comorbidity. This semi-structured interview can be used to diagnose each of the 10 personality disorders. Reliability is generally good—for example, the Cohen's kappa for the inter-rater reliability for BPD has been found to be 0.91 (Maffei et al., 1997).

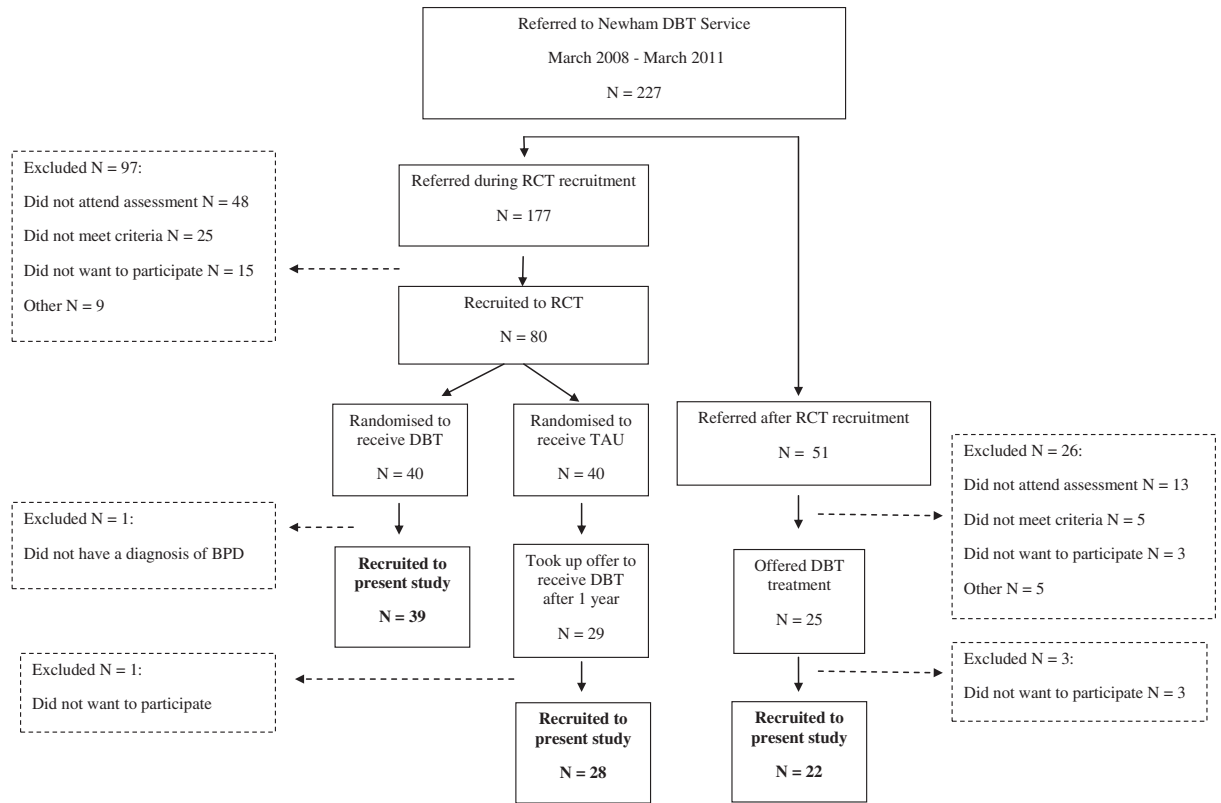
Gender, age, employment and ethnicity were also documented by researchers at baseline.

### *Treatment received*

The treatment received by participants over the 12-month study period was recorded every 2 months using the Client Service Receipt Inventory (Beecham & Knapp, 2001), and the details of treatment received and date of treatment completion or dropout were also recorded by researchers using a standardized form.

### *Outcome measures*

Self-harm frequency during the study year was assessed every 2 months using a standardized self-report form. Self-harm was classified as any intentional act of tissue damage, and, where



**Figure 1:** Recruitment of participants into the study. DBT, dialectical behaviour therapy; RCT, randomized controlled trial; TAU, treatment as usual; BPD, borderline personality disorder

participants reported acts of self-harm, researchers questioned them to ascertain that these criteria were met.

Borderline personality disorder symptom severity was assessed at baseline and every 6 months thereafter using the Zanarini Scale for BPD (Zanarini et al., 2003). The scale has been shown to have high convergent and discriminant validity, good inter-rater reliability and good test–retest reliability (Zanarini et al., 2003). In the present study, the internal consistency was acceptable at baseline and month 6, and good at month 12 (Cronbach’s alpha = 0.73, 0.71 and 0.83, respectively).

### Statistical analysis

Analysis was conducted in STATA/SE version 11.0 (StataCorp., 2009). Comparisons between

participants with and without PTSD on baseline characteristics were conducted using linear regression for continuous variables, logistic regression for binary variables, multinomial logistic regression for categorical variables with more than two levels (i.e. ethnicity) and negative binomial regression for overdispersed count variables (i.e. self-harm). Random effects multi-level modelling was used to evaluate the main and interaction effects of time, treatment completion and PTSD diagnosis on the number of days with self-harm and BPD symptom severity during the study year. Initial goodness of fit tests suggested significant overdispersion in the self-harm outcome data. Multilevel Poisson regression using a generalized linear latent and mixed model with robust standard errors was used to handle this, as suggested by Rabe-Hesketh and Skrondal (2012). This

method uses adaptive quadrature to estimate the association between variables, producing more reliable estimates than many other methods (Rabe-Hesketh et al., 2002). Distribution checks suggested that the BPD symptom severity outcome data did not conform to a normal distribution and could not be transformed to approximate normality, and so, multilevel linear regression with the sandwich estimator for standard errors was used because this is robust to violations of the normality assumption (Rabe-Hesketh & Skrondal, 2012).

## Results

### Recruitment

Of the 227 individuals referred to the DBT team between March 2008 and March 2012, 89 were

recruited into the present study, as summarized in Figure 1. Data was obtained at all six follow-ups for 61 participants, at five follow-ups for 11 participants, and between 1 and 4 follow-ups for 13 participants. No follow-up data were obtained from four research participants who became uncontactable following recruitment.

### Description of the sample

The sociodemographic and clinical characteristics of the sample are presented in Table 1. Fifty-one participants met criteria for both BPD and PTSD, and 38 for BPD but not PTSD. Patients with and without PTSD did not differ on any of the variables listed in Table 1, with the exception that those with PTSD were more likely to be of black ethnicity (relative risk ratio = 6.1, standard error

Table 1: Baseline characteristics

Variable	Whole Sample (N = 89)	Participants with BPD and PTSD (N = 51)	Participants with BPD without PTSD (N = 38)
Gender (n, %)			
Female	78 (88%)	46 (90%)	32 (84%)
Male	11 (12%)	5 (10%)	6 (16%)
Age (mean, SD)	33 (10.7)	33 (10.6)	32 (11.0)
Employed (n, %)	25 (28%)	13 (26%)	12 (32%)
Ethnicity			
White	55 (62%)	26 (51%)	29 (76%)
Black	13 (15%)	11 (22%)	2 (5%)
South Asian	15 (17%)	10 (20%)	5 (13%)
East Asian	2 (2%)	2 (4%)	0 (0%)
Mixed	4 (4%)	2 (4%)	2 (5%)
Current major depression (n, %)	67 (75%)	40 (78%)	27 (71%)
Current manic episode (n, %)	12 (13%)	6 (12%)	6 (16%)
Current panic disorder (n, %)	27 (30%)	20 (39%)	7 (18%)
Current agoraphobia (n, %)	54 (61%)	34 (68%)	20 (51%)
Current social phobia (n, %)	49 (55%)	31 (61%)	18 (47%)
Current obsessive-compulsive disorder (n, %)	49 (56%)	34 (68%)	15 (40%)
Current alcohol dependence (n, %)	29 (33%)	16 (32%)	13 (34%)
Current substance dependence (n, %)	23 (26%)	13 (25%)	10 (26%)
Number of personality disorders (mean, SD)	3.2 (1.5)	3.2 (1.4)	3.2 (1.5)
Number of days with self-harm in the 12 months before treatment	83 (114)	78 (104)	89 (127)
BPD symptom severity (mean, SD)	17.0 (6.5)	17.4 (6.2)	16.6 (6.9)

BPD, borderline personality disorder; PTSD, post-traumatic stress disorder; SD, standard deviation.

(SE) = 5.0, 95% confidence interval (CI) = 1.24 = 30.3,  $p = 0.03$ ), more likely to have comorbid panic disorder (odds ratio = 2.9, SE = 1.4, 95% CI = 1.06–7.72,  $p = 0.04$ ) and more likely to have comorbid obsessive compulsive disorder (odds ratio = 3.3, SE = 1.5, 95% CI = 1.35–7.86,  $p < 0.01$ ).

### Treatment received

Of the 89 patients initiating DBT treatment, only 39 completed the full 12 months. The remaining 50 completed between 1 and 11 months of DBT (mean = 5.3 months, SD = 3.0). After dropping out from DBT, they were referred on to various other forms of psychiatric treatment, including treatment by a community psychiatric nurse ( $N = 2$ ), treatment by a psychiatrist ( $N = 11$ ), treatment by a clinical psychologist ( $N = 3$ ), care from a support worker ( $N = 1$ ), care from a social worker ( $N = 1$ ), inpatient care ( $N = 4$ ), counselling ( $N = 2$ ), care coordination ( $N = 1$ ), GP care alone ( $N = 15$ ) or unknown care due to nonattendance of research follow-ups ( $N = 10$ ). The likelihood of completing DBT did not differ between patients with and without comorbid PTSD.

### The association between PTSD diagnosis and outcome

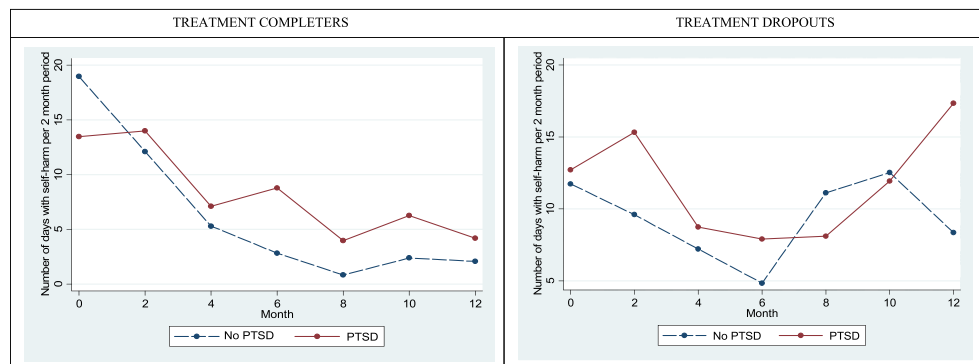
Self-harm decreased significantly over time (incident risk ratio (IRR) = 0.94, SE = 0.02, 95% CI = 0.90–0.98,  $p < 0.01$ ), as did BPD symptom severity ( $\beta = -0.37$ , SE = 0.08, 95% CI =  $-0.53$  to  $-0.21$ ,  $p < 0.01$ ).

The main effect of PTSD diagnosis on self-harm frequency was not significant, but there was a significant three-way interaction effect of PTSD, time and treatment completion (IRR = 1.15, SE = 0.08, 95% CI = 1.01–1.32,  $p = 0.04$ ). This three-way interaction remained significant at  $p < 0.05$  after adjusting for participants' total number of Axis I diagnoses. Post-hoc tests identified that, in DBT completers only, there was a significant interaction effect of PTSD and time in treatment on self-harm frequency, with self-harm decreasing significantly more over time in patients without PTSD than in those with PTSD (IRR = 1.16, SE = 0.07, 95% CI = 1.04–1.30,  $p < 0.01$ ). This interaction remained significant at  $p < 0.01$  after adjusting for participants' total number of Axis I diagnoses. This interaction is depicted graphically in Figure 2.

There was a trend towards a significant main effect of PTSD diagnosis on BPD symptom severity during the treatment year, with higher symptom severity in patients with PTSD ( $\beta = 2.12$ , SE = 1.18, 95% CI =  $-0.21$ –4.44,  $p = 0.07$ ). However, the CI crossed zero, and hence, this was not a reliable effect. There was no significant interaction between PTSD diagnosis and time in treatment or treatment completion.

## Discussion

The present research found that patients with comorbid PTSD and BPD who completed a



**Figure 2:** Change in self-harm over time in patients with and without post-traumatic stress disorder (PTSD)



12-month course of DBT achieved significantly less reduction in self-harm over time than those with BPD alone. This effect was not apparent in DBT dropouts. Patients with this comorbidity also showed a trend for more severe BPD symptoms throughout the course of treatment.

These results are concurrent with the only other study to assess the influence of PTSD comorbidity on the outcome of psychotherapy for BPD, that of Harned et al. (2010b). Evidence suggests that PTSD symptoms can aggravate BPD traits and vice versa, in particular leading to increased anger, anxiety, depression, impulsivity and suicide proneness (Vignarajah & Links, 2009). Thus, symptoms of PTSD could have contributed directly to the increased severity of BPD symptoms found in the present study. Furthermore, women with comorbid BPD and PTSD are more likely than those with BPD alone to report trauma-linked triggers for self-harming behaviour, such as flashbacks, nightmares, or thoughts about sexual abuse or rape (Harned et al., 2010a). These triggers could have contributed to difficulties achieving reduction in self-harm compared with participants with BPD alone—especially if DBT Stage 1 as it is currently practiced is not adequately focused on addressing these trauma-related experiences.

In addition, PTSD is associated with emotional numbing—that is, difficulty feeling or expressing emotions (American Psychiatric Association, 2000). A key mechanism of self-harm reduction in DBT is theorized to be the acquisition of behavioural skills used to regulate emotional responding (Linehan, 1993a). Greater use of the DBT skills has been shown to be associated with greater reduction in self-harm and BPD symptom severity during therapy (Barnicot & Priebe in preparation; Neacsiu et al., 2010; Stepp et al., 2008). However, an important element of the DBT skills is learning to recognize emotional distress and to identify the particular emotion being experienced, through a combination of mindfulness and emotion regulation skills (Linehan, 1993b). Qualitative research with DBT participants has confirmed that patients

experience this as key to achieving reductions in self-harm and feel that recognizing distress and identifying emotions is an important precursor to using the other DBT skills (Barnicot et al., in preparation). Thus, the emotional numbing and alexithymia associated with PTSD could interfere with the ability of comorbid BPD–PTSD patients to benefit from using the DBT skills. Alexithymia is also positively associated with dysregulated behaviour including self-harm, again possibly contributing to poorer outcomes in those with PTSD (Fink et al., 2010). One may speculate that alexithymia could also lead patients with comorbid PTSD to experience difficulty with other evidence-based treatments for BPD, such as MBT with its focus on ‘mentalizing’ or attending to mental states and reflecting on them coherently (Bateman & Fonagy, 2006). In support of this idea, comorbid BPD–PTSD has been found to be associated with particularly poor mentalizing abilities (Lewis et al., 2012).

Furthermore, some of the participants in the current study may have been suffering from complex PTSD, a sub-type of PTSD that overlaps conceptually and empirically with BPD (Herman, 1992), and is particularly associated with the types of trauma that are also associated with BPD, that is, childhood abuse. Alexithymia is particularly problematic in this type of PTSD, as is shame associated with abuse (van der Kolk et al., 2005). Shame has been shown to predict self-harm occurrence during DBT (Brown et al., 2009), and as such could offer another explanation for the negative effect of PTSD on self-harm reduction in the present study.

It is not clear why this effect was found in DBT completers but not dropouts. The course of self-harm was much more erratic in DBT dropouts, as shown in Figure 2, and thus, any effect would have been more difficult to detect, especially given limited statistical power. What the finding does demonstrate is that the effect of PTSD on self-harm outcome was not linked to a differential dropout rate in the comorbid subgroup.

### *Strengths and limitations*

A strength of the present research was that there were few exclusion criteria, and participants with severe comorbid mental illnesses such as schizophrenia or bipolar disorder were not excluded, making the sample a good reflection of that seen in everyday clinical practise. Furthermore, the use of random effects multilevel modelling ensured that participants with some missing follow-up data were still included in the analysis, thus reducing the bias associated with missing data. Random effects multilevel modelling also gives reliable estimates even when data is missing, provided data is missing at random (Rabe-Hesketh & Skrondal, 2012).

A limitation is that the analysis did not adjust for potential confounding factors. For instance, participants with comorbid BPD–PTSD had higher rates of panic disorder and agoraphobia, which could have confounded the association between PTSD and treatment outcome. However, the analysis did adjust for participants' total number of Axis I diagnoses, and the findings remained significant. Thus, the findings are unlikely to indicate that PTSD is associated with worse outcome because these patients are more ill overall. Rather, the results may represent a specific negative effect of PTSD.

### *Implications for research and clinical practise*

The findings imply that the Stage 1 DBT treatment model as it currently stands may not adequately address the needs of patients with comorbid BPD and PTSD. Future research should identify whether this also applies to other treatment models for BPD such as mentalization-based therapy and should identify factors mediating the negative effect of PTSD on treatment outcome. These could include the effect of specific aspects of PTSD, such as the severity of intrusions or the severity of affective numbing. Frankenburg and Kymalainen (2009) suggest that the effect of PTSD on BPD could be moderated by gender or trauma type. Researchers should also explore the

influence of complex PTSD and its sequelae such as alexithymia and shame. Further to this, the effect of PTSD symptoms on treatment mechanisms, such as the therapeutic alliance or the ability to learn and use the DBT skills, should be evaluated.

In the light of future findings on how PTSD symptoms interfere with treatment for BPD, current treatment for BPD should be modified to better cater for the needs of those with comorbid PTSD. Clinicians could consider combining interventions for BPD with interventions that more directly target PTSD symptoms. Preliminary evidence suggests that combining DBT with exposure therapy (Harned et al., 2012) or trauma-focused cognitive-behavioural treatment (Steil et al., 2011) is both safe and efficacious. The effectiveness of these interventions should be further evaluated.

### **Conclusion**

Patients with comorbid PTSD and BPD may not gain as much benefit from Stage 1 DBT as those with BPD alone, possibly because of the negative impact of unaddressed PTSD symptoms. Future research should evaluate mediators of the negative effect of PTSD on outcome and should extend preliminary work on combining treatment for BPD with evidence-based treatment for PTSD.

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