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Skills use and common treatment processes in dialectical behaviour therapy for borderline personality disorder

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Background and Objectives: Dialectical behaviour therapy (DBT) trains participants to use behavioural skills for managing their emotions. The study aimed to evaluate whether skills use is associated with positive treatment outcomes independently of treatment processes that are common across different therapeutic models.

Method: Use of the DBT skills and three common treatment processes (therapeutic alliance, treatment credibility and self-efficacy) were assessed every 2 months for a year in 70 individuals with borderline personality disorder receiving DBT. Mixed-multilevel modelling was used to determine the association of these factors with frequency of self-harm and with treatment dropout.

Results: Participants who used the skills less often at any timepoint were more likely to drop out of DBT in the subsequent two months, independently of their self-efficacy, therapeutic alliance or perceived treatment credibility. More frequent use of the DBT skills and higher self-efficacy were each independently associated with less frequent concurrent self-harm. Treatment credibility and the alliance were not independently associated with self-harm or treatment dropout.

Limitations: The skills use measure could not be applied to a control group who did not receive DBT. The sample size was insufficient for structural equation modelling.

Conclusion: Practising the DBT skills and building an increased sense of self-efficacy may be important and partially independent treatment processes in dialectical behaviour therapy. However, the direction of the association between these variables and self-harm requires further evaluation.

Keywords: personality disorder, behavior therapy, deliberate self-harm

Highlights

- More frequent skills use was associated with a lower likelihood of subsequent dropout
- Participants self-harmed less often when they used the DBT skills more often
- Skills use predicted dropout and self-harm independently of common treatment processes
- Higher self-efficacy was independently associated with a lower rate of self-harm
- Self-efficacy and self-harm were bi-directionally and cross-temporally associated

1. Introduction

Despite growing evidence for the effectiveness of a number of different psychological treatments for borderline personality disorder (BPD) (Stoffers et al. 2012), evidence on treatment processes is minimal. Dialectical behaviour therapy (DBT) is one of the most commonly used treatment models for BPD (Rivzi et al., 2013; Swales et al., 2012) and has been tested in numerous randomised controlled trials. Meta-analysis of these trials suggests a medium effect size favouring DBT over treatment as usual, for reducing suicide and self-injury, and for improving global outcomes (Kliem et al., 2010). DBT is based on the biosocial theory of BPD. A major premise is that BPD develops when emotionally sensitive individuals encounter invalidating environments that ignore, suppress or punish their emotions, which further compounds their emotional sensitivity and prevents development of the behavioural and cognitive skills required to self-regulate emotions (Linehan, 1993a). DBT therefore has five essential functions: 1) to teach skills for more effective emotional and behavioural regulation, 2) to enhance client motivation to use these skills, 3) to ensure clients can use the skills in a wide variety of situations, 4) to help shape an environment that reinforces skill use and 5) to enhance the therapist's own skills and motivation to keep working effectively with the client (Linehan 1993a, 1993b).

Other treatment models for borderline personality disorder, such as mentalization based therapy, schema-focussed therapy and transference focussed therapy, achieve comparable outcomes, despite each taking a different approach to treating BPD (Bateman & Fonagy, 2009; Clarkin et al., 2007; Farrell, Shae, & Webber, 2009; Giesen-Bloo et al. 2006). It is possible that each of these treatment models operates via different specific treatment mechanisms that offer different routes to the same outcome. It is also feasible that the techniques used in one model can activate the therapeutic processes specified in another

model. Moreover, the effectiveness of different treatment models may suggest the importance of considering treatment processes that are common to multiple models of therapy. Frank and Frank (1991) and Wampold (2001) theorise that key treatment processes common across all effective psychotherapy models include treatment credibility (the client's perception that their treatment is a credible means of improving their mental health), the therapeutic alliance (the development of a bond and a working alliance between client and therapist), and self-efficacy (the client's belief that they can perform difficult tasks or cope with challenges in various domains of their lives).

Poor therapeutic alliance is one of the most consistent predictors of poor clinical outcomes in psychotherapy for BPD (Barnicot et al. 2012), including DBT (Leerer, 1997; Turner, 2000; Bedics et al. 2015), and has been shown to predict dropout from schema-focussed therapy and transference-focussed therapy (Spinhoven et al., 2007). However, the association of treatment credibility and self-efficacy with treatment outcome in BPD has not been studied. Two studies of dialectical behaviour therapy have shown that patients who use the DBT skills more often achieve greater reductions in BPD symptoms and self-harm (Neacsiu, Rizvi, & Linehan, 2010; Stepp, Epler, Jahng & Trull, 2008). Furthermore, Neascui and colleagues also assessed skills use in a control group receiving other forms of psychological treatment, and found that skills use was 3 times higher in the DBT condition by the end of treatment, and that skills use fully mediated the effect of DBT on decreasing suicide attempts, depression and anger, and partially mediated the reduction in self-harm (Neascui et al. 2010). Whilst there were no significant differences between DBT and the control condition in participants' expectations of positive outcomes or therapeutic alliance (Linehan et al. 2006, Bedics et al. 2015), the interrelationship between skills use and common treatment processes was not assessed. It is likely that participants who use the DBT skills more also have a stronger sense of self-efficacy, find their treatment more credible and have a stronger therapeutic alliance.

Therefore, any observed positive effect of DBT skills use on outcome could be confounded by these common treatment processes. It is therefore important to determine the interrelationship between DBT skills use and common treatment processes, and to determine whether DBT skills use is associated with positive treatment outcomes independently of common treatment processes.

The present study therefore aimed to evaluate the following research questions:

1) Is more frequent use of the DBT skills associated with more positive perceptions of treatment credibility, the therapeutic alliance and self-efficacy, and vice versa?

2) Are DBT skills use, treatment credibility, the therapeutic alliance and self-efficacy independently associated with a lower rate of self-harm?

3) Are DBT skills use, treatment credibility, the therapeutic alliance and self-efficacy independently associated with a lower probability of dropping out of treatment in the subsequent two months?

2. Method

2.1 Design

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

2.2 Inclusion and Exclusion Criteria

Participants were included if they:

1) Had a diagnosis of borderline personality disorder

2) Had self-harmed in the 12 months prior to recruitment

3) Entered into a dialectical behaviour therapy programme

4) Attended at least one DBT skills group session and completed at least one assessment of skills use.

The only exclusion criteria were learning or English language difficulties of sufficient severity to prevent completion of study questionnaires.

2.3 Study Setting

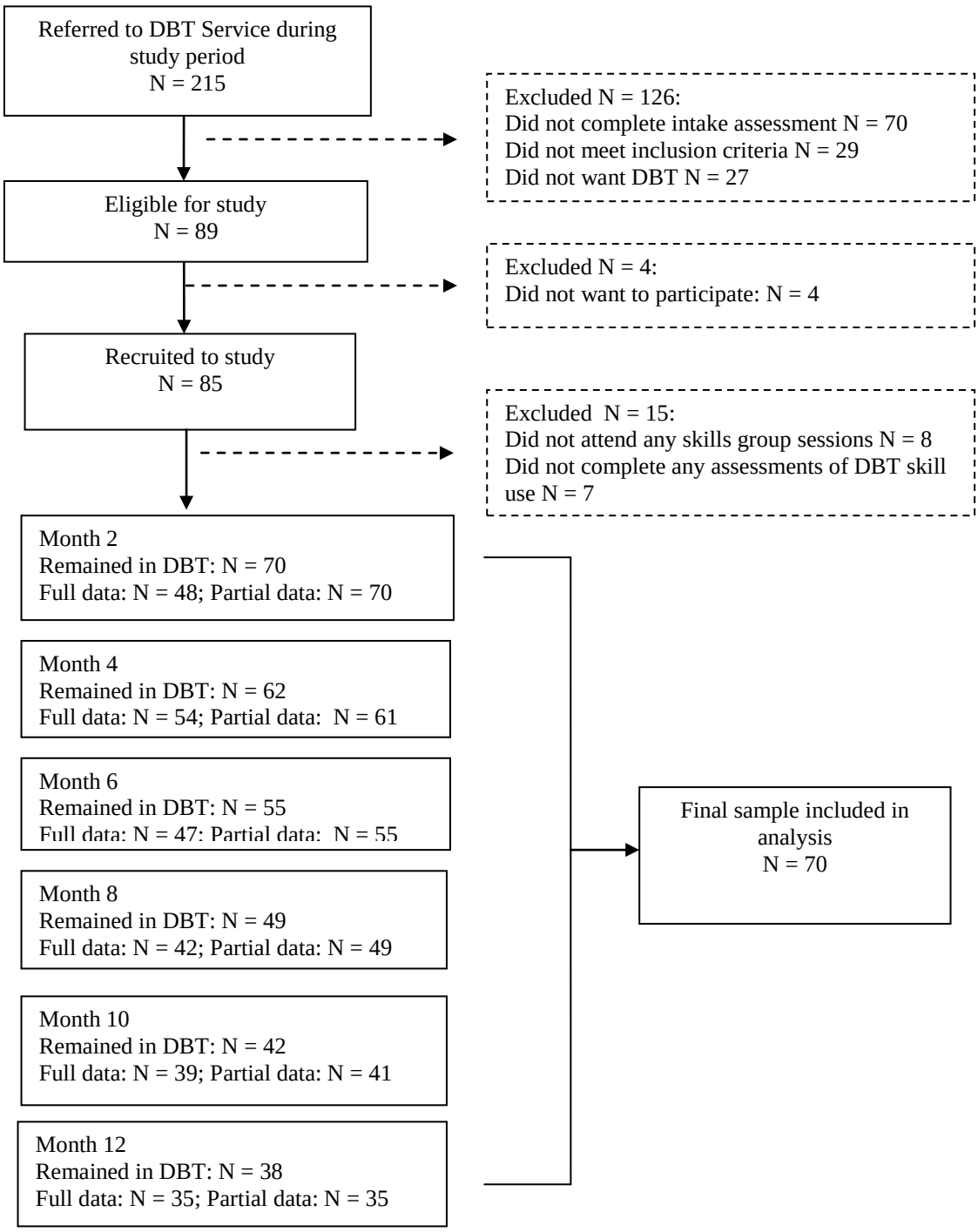
The study took place in a community personality disorder service in the United Kingdom, in an inner city area with high levels of socioeconomic deprivation and ethnic diversity. The service was initiated in 2003 and offers a twelve month course of DBT (one hour individual therapy a week, two hours group skills training a week, out of hours telephone skills coaching). In addition, the service provides care coordination according to the care programme approach (CPA; Department of Health, 2008), including consultant responsibility and medication management. All therapists were trained by the treatment developer's official training provider (Behavior Tech), some receive supervision from DBT experts, and trained adherence raters have assessed both group and individual sessions as adherent to the DBT model (Priebe et al., 2012). The service implements Linehan's attendance requirements - namely, that therapy is discontinued if a service-user misses more than 3 consecutive individual or group sessions (Linehen et al. 1991).

2.4 Procedure

All participants were recruited between May 2008 and March 2011. Some participants (N = 52 of the final analysis sample) were concurrently participating in a randomised controlled trial of DBT versus treatment as usual (Priebe et al., 2012). The remainder were recruited

from referrals to the DBT service after RCT recruitment had ceased. The flow of participants through the present study is summarised in Figure 1.

Figure 1. Flow of participants through the study



The clinical 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 two months for a year in order to collect process and outcome data, including assessments of all of the skills and common factor treatment processes and self-harm. Interviews were conducted face-to-face wherever possible but in a few instances were conducted over the phone following repeated non-attendance of face-to-face appointments. All study procedures were approved and monitored by the Camden and Islington Community Research Ethics Committee, London, United Kingdom.

2.5 Measures

2.5.1 Baseline measures.

The Structured Clinical Interview for DSM-IV, Axis II (SCID-II) (First, Gibbon, Spitzer, Williams, Benjamin, 1997) was administered by the clinical DBT team to ascertain that participants met criteria for BPD. Some members of the clinical DBT team had received formal training in this diagnostic interview which was then disseminated to other team members using peer-to-peer training. Borderline personality disorder severity was assessed using the Zanarini Scale for Borderline Personality Disorder (ZAN-BPD) (Zanarini, Vujanovic, Parachini, Boulanger, Frankenburg , & Hennen, 2003). Comorbid Axis I disorders were assessed using the Mini International Neuropsychiatric Interview (MINI) (Sheehan, Lecrubier, Sheehan, 1998). Gender, age, employment, ethnicity and psychiatric medication use were also documented by researchers at baseline.

2.5.2 Skills use and common therapeutic factor measures.

2.5.2.1 Skills use.

Frequency of skills use was assessed every 2 months through a self-report questionnaire, which asked participants to specify on how many days in the past week they had used each of the four skills types, i.e. Mindfulness, Interpersonal Effectiveness, Emotion Regulation and Distress Tolerance, with an item for each skill type. For example, the item on use of Mindfulness asked "On which days did you use Mindfulness this week? Please tick" and gave the options "Monday", "Tuesday", "Wednesday" etc. The questionnaire included a reminder of the specific types of skills included in each category. A summary score for total skill use over the past seven days was then calculated by adding the number of days on which each skill type was used, with possible scores ranging from 0 to 28.

The internal consistency of the measure was good, with a Cronbach's alpha of 0.87. In the present sample, the intraclass correlation coefficient was 0.66 for the correlation between repeated assessments of whether participants had used the skills at each 2 month timepoint, indicating a good level of test-retest reliability. To maximise face validity, the questionnaire was piloted with clients receiving DBT and with DBT therapists, who gave feedback on the relevance and ease of comprehension of the questions and of the response options. Their suggestions were incorporated to maximise readability and relevance. Finally, the criterion validity of the measure was evaluated by comparing skill use at each 2 monthly timepoint over the 12 month study period, between participants still participating in DBT and participants who had dropped out of DBT at that particular point in time. A repeated measures random effects logistic regression showed that the odds of participants reporting any use of the DBT skills in the past week were significantly higher if they were still participating in DBT at that particular timepoint (odds ratio = 8.55, 95% C.I. 2.93 to 25.0, p <

0.01). This suggests that the skills use questionnaire was capturing behaviours encouraged by current participation in DBT skills training.

2.5.2.2 Self-efficacy.

Self-reported global self-efficacy was assessed every two months using the Generalized Self-Efficacy Scale (Schwarzer & Jerusalem, 1995). The total score can range from 10 to 40, with higher scores reflecting higher self-efficacy. The internal consistency of this measure has been found to be good or excellent, with Cronbach's alpha ranging from 0.81 to 0.91(Schwarzer, Bäßler, Kwiatek, Schröder & Zhang, 1997). In the present sample, the intraclass correlation coefficient was 0.54, indicating an adequate level of test-retest reliability given that self-efficacy would be expected to change over time during treatment.

2.5.2.3 Therapeutic alliance.

The quality of the therapeutic alliance (patient-rated) was assessed every two months using the self-report Scale To Assess Therapeutic Relationships in Community Mental Health Care: Patient Version (STAR-P) (McGuire-Sneakus et al.2007). The STAR-P was designed for use in community mental health care settings and includes some items from other alliance measures (such as the Working Alliance Inventory, the Helping Alliance Scale and the California Psychotherapy Alliance Scale), with items selected based on a principal component analysis, test-retest reliability and patient ratings of applicability in community mental health patients. In the present sample, the internal consistency and test-retest reliability were good (Cronbach's alpha = 0.89, ICC = 0.65).

2.5.2.4 Treatment credibility.

Treatment credibility was assessed every two months using the self-report Treatment Credibility Scale (Borkovec & Nau, 1972). This scale assesses to what extent participants

find the treatment they are receiving credible and believe that it can help them with their problems, with possible scores ranging from 4 to 20. This measure has high internal consistency, ranging from 0.88 to 0.92, and discriminates well between intervention and control conditions in clinical trials (Borkovec & Nau, 1972; Kirsch & Henry, 1977). In the present sample, the intraclass correlation coefficient was 0.60, indicating a good level of test-retest reliability.

2.5.3 Outcome measures.

Self-harm frequency during the study year was assessed by the researchers every 2 months using a standardised interview protocol based on select questions drawn from the Linehan Suicide Attempt Self-Injury Interview (SASII) to assess the frequency, intentionality and method of self-harm and suicide attempts (Linehan et al. 2006). These questions were used to determine the number of incidents of self-harm in each time period that met the following criteria as defined in the SASII: "Any overt, acute, nonfatal self-injurious act where both act and bodily harm or death are clearly intended (i.e., both the behavioral act and the injurious outcomes are not accidental) that results in actual tissue damage, illness, or, if no intervention from others, risk of death or serious injury" (Linehan 1996). Both non-suicidal and suicidal self-harm are included in this definition. The psychometric properties of the questions we have drawn from the SASII are good, with a high level of inter-rater reliability for all assessor-rated items (median ICC = 0.96, range 0.87 to 0.98), and good concurrent validity as suggested by a high correlation with the frequency of self-harm as recorded on therapy diary cards (ICC = 0.91) (Linehan et al. 2006). In our sample, 50% of the variance in the presence/ absence of self-harm over time was explained by clustering within individuals (ICC = 0.50); an acceptable level of test-retest reliability given the large time intervals and expected change

in self-harm over time. There was also a strong positive correlation between the frequency of self-harm in our sample and the severity of self-harming behaviour as assessed by the Zanarini Scale for Borderline Personality Disorder, indicating good concurrent validity (month 6 Spearman's $\rho = 0.62$, $p < 0.01$; month 12 Spearman's $\rho = 0.70$, $p < 0.01$).

Treatment dropout was assessed by recording whether the participant was still in treatment at each two month timepoint over the twelve month study period.

2.6 Statistical Analysis

Analysis was conducted in STATA/SE version 11.0 (StataCorp, 2009). The treatment process variables (frequency of DBT skills use in the past week, perceived treatment credibility, therapeutic alliance and self-efficacy), and the outcome variables (frequency of self-harm, dropout from DBT) were each assessed every 2 months. The treatment process and outcome variables were therefore modelled as time-varying, and all models were multilevel, which specified a random intercept at the participant level to account for within-subject measurement autocorrelation. Once a participant had dropped out of DBT, data from subsequent timepoints was not included in the analysis as ratings of the therapeutic alliance, treatment credibility and DBT skills use would be confounded by the participant having already dropped out of treatment.

We fitted univariate models in order to test whether more frequent use of the DBT skills at each timepoint was associated with more positive concurrent perceptions of treatment credibility, the therapeutic alliance and self-efficacy, and vice versa.

In order to evaluate the association between the treatment process variables and self-harm, we first fitted univariate models to test the association between each of the treatment process variables and the concurrent frequency of self-harm. We then also evaluated the cross-temporal associations between each of the treatment process variables and the frequency of self-harm, by testing lagged values (prior 2 months) of each treatment process variable as predictors of the frequency of self-harm, and by testing the lagged frequency (prior 2 months) of self-harm as a predictor of the treatment process variables. Finally, we fitted a multivariate model in order to test whether the frequency of DBT skills use in the past week was associated with the frequency of self-harm independently of the common treatment process variables. The model simultaneously tested concurrent levels of all treatment processes as predictors of the frequency of self-harm at each timepoint, and was also adjusted for the effect of socideomographic and clinical characteristics that had been shown to be significantly associated with self-harm in univariate models, and for whether the participant completed the full DBT programme or dropped out.

In order to evaluate the association between the treatment process variables and treatment dropout, we first fitted univariate models to test whether lagged values of the treatment process variables at the prior 2 month timepoint predicted the odds of dropping out of treatment at the subsequent 2 month timepoint. (We did not test concurrent associations between treatment processes and dropout, or between dropout and subsequent ratings of treatment processes, as ratings of the therapeutic alliance, treatment credibility and DBT skills use would be confounded by the participant having already dropped out of treatment). Finally, we fitted a multivariate model to test whether the frequency of DBT skills use at each timepoint was associated with the odds of dropping out of treatment in the subsequent two months, independently of the common treatment process variables. The model simultaneously tested time-lagged values of all treatment process variables as predictors of

treatment dropout at each timepoint, and was also adjusted for participants' sex, since males were more likely to drop out.

Models in which the frequency of DBT skills use or the frequency of self-harm were dependent variables, used generalised linear latent and mixed poisson regression (gllamm) with robust standard errors used to account for the overdispersion in these variables (as recommended by Rabe-Hesketh and Skrondal, 2012). Models in which treatment credibility, the therapeutic alliance or self-efficacy were dependent variables used mixed-effects linear regression with robust standard errors to correct for the non-normal distribution of these variables. Models in which participants' treatment status at each timepoint (remained in treatment vs. dropped out) was the dependent variable, used mixed-effects logistic regression.

3. Results

3.1 Recruitment

Of the 215 individuals referred to the DBT team between March 2008 and March 2012, 85 were recruited into the present study, as summarised in Figure 1. The final sample consisted of 70 participants who attended at least one DBT skills group and provided at least one assessment of DBT skill use.

3.2 Description of the Sample

The sample consisted of 63 women (90%) and 7 men (10%), with an average age of 32 years (s.d. 10.6). Twenty-two (32%) were employed, and the most common ethnicity was White (60%), followed by South Asian (19%), Black (14%), Mixed (6%) and East Asian (1%). Common comorbidities included major depressive disorder (74%), post-traumatic stress

disorder (PTSD; 56%), obsessive-compulsive disorder (52%), psychotic disorder (36%), panic disorder (31%), alcohol dependence (36%), and substance dependence (29%). The average baseline BPD severity score (ZAN-BPD) was 17.3 (s.d. 6.3). Seventy-six percent were prescribed psychiatric medication at baseline. Descriptive statistics on skills use, the common treatment processes and the outcome variables at baseline and each of the follow-ups are presented in Table 1 below. Data on skills use and the common treatment processes could not be obtained at all timepoints for all participants, since some participants had a delayed start to skills training or dropped out of the DBT treatment, rendering these questionnaires no longer applicable. However, at least one assessment of each of these variables was obtained for each participant.

Table 1. Skills use, common factors and outcome variables at baseline and follow-up

	Baseline		Month 2		Month 4		Month 6		Month 8		Month 10		Month 12	
	N	Mean (s.d.) / n (%)	N	Mean (s.d.) / n (%)	N	Mean (s.d.) / n (%)	N	Mean (s.d.) / n (%)	N	Mean (s.d.) / n (%)	N	Mean (s.d.) / n (%)	N	Mean (s.d.) / n (%)
N remaining in DBT treatment	70	70 (100%)	70	70 (100%)	70	62 (89%)	70	55 (79%)	70	49 (70%)	70	42 (60%)	70	38 (54%)
Number of days with self-harm	70	14.9 (19.8)	70	12.7 (20.3)	61	7.2 (13.9)	55	8.4 (15.6)	49	6.5 (15.2)	41	6.1 (13.9)	35	3.4 (9.2)
Frequency of DBT skill use in the past week		n.a	48	5.8 (6.9)	54	9.2 (8.1)	47	11.4 (8.4)	43	15.0 (8.4)	39	15.2 (8.9)	35	16.7 (8.3)
Treatment credibility	54	14.9 (2.9)	66	15.2 (4.0)	55	15.9 (3.5)	49	16.5 (3.6)	42	16.7 (3.4)	39	17.3 (2.6)	35	16.9 (2.9)
Therapeutic alliance		n.a	65	37.3 (8.7)	56	38.5 (6.8)	50	38.7 (6.4)	42	39.0 (6.4)	39	40.2 (6.5)	35	39.0 (6.5)
Self-efficacy	58	20.8	67	22.1	58	23.1	50	23.9	43	24.7	40	25.2	35	25.6

		(6.6)		(6.6)		(6.8)		(6.2)		(5.6)		(5.1)		(5.6)

3.3 Treatment Dropout

Of the 70 participants initiating DBT treatment, only 37 completed the full 12 months. The remaining 33 completed between 1 and 11 months of DBT. Overall, the mean number of months completed was 9.4 (s.d. = 3.4), and the mean number of hours of treatment received was 79 (s.d. = 38).

3.4 Is more frequent use of the DBT skills associated with more positive perceptions of treatment credibility, the therapeutic alliance and self-efficacy, and vice versa?

Each of the treatment process variables was positively associated with each of the other treatment process variables, as shown in Table 2. Participants who used the DBT skills more often reported more positive perceptions of treatment credibility, the therapeutic alliance and self-efficacy - and vice versa.

Table 2. Time-varying[a] univariate associations between treatment process variables

Independent variable	N	n	β / Exp(β)	95% confidence interval	p
Dependent variable: Frequency of DBT skills use [b]					
Treatment credibility	70	260	1.11	1.05 to 1.18	< 0.01
Therapeutic alliance	70	263	1.03	1.01 to 1.05	< 0.01
Self-efficacy	70	265	1.04	1.03 to 1.06	< 0.01
Dependent variable: Treatment credibility					
Frequency of DBT skills use [b]	70	260	0.08	0.04 to 0.12	< 0.01
Therapeutic alliance	70	280	0.18	0.13 to 0.24	< 0.01
Self-efficacy	70	286	0.13	0.06 to 0.19	< 0.01
Dependent variable: Therapeutic alliance					
Frequency of DBT skills use [b]	70	263	0.12	0.04 to 0.19	< 0.01
Treatment credibility	70	280	0.91	0.59 to 1.21	< 0.01
Self-efficacy	70	284	0.17	0.06 to 0.28	< 0.01
Dependent variable: Self-efficacy					

Frequency of DBT skills use [b]	70	265	0.19	0.12 to 0.26	< 0.01
Treatment credibility	70	286	0.54	0.32 to 0.75	< 0.01
Therapeutic alliance	70	284	0.13	0.04 to 0.22	< 0.01

β = unexponentiated coefficient for linear dependent variables; Exp(β) = incidence rate ratio for count dependent variables or odds ratio for binary dependent variables; N = number of participants with data; . n = number of available datapoints; a Time-varying = assessed every 2 months over a 12 month period, where applicable, and modelled as repeated measures data ; b Number of days in the past week on which each of 4 DBT skill-types were used;

independently associated with a lower rate of self-harm?

The univariate and multivariate associations between the treatment process variables and the concurrent frequency of self-harm, are shown in Table3. In univariate models, less frequent self-harm was concurrently associated with more frequent DBT skills use and higher ratings of the therapeutic alliance, and showed a trend towards association with higher self-efficacy and treatment credibility. Additionally, cross-temporal models showed that less frequent self-harm was associated with higher self-efficacy and higher treatment credibility at both the prior and subsequent two-month timepoints. The cross-temporal associations are depicted in Figure 2.

However, in a multivariate model simultaneously testing the time-varying association of all of the treatment process variables with the concurrent frequency of self-harm, only more frequent DBT skills use and higher self-efficacy were independently associated with less frequent concurrent self-harm.. The model was also adjusted for whether the participant completed the full DBT programme or dropped out, and for the effect of participant characteristics that had been shown to be significantly associated with self-harm in univariate models.

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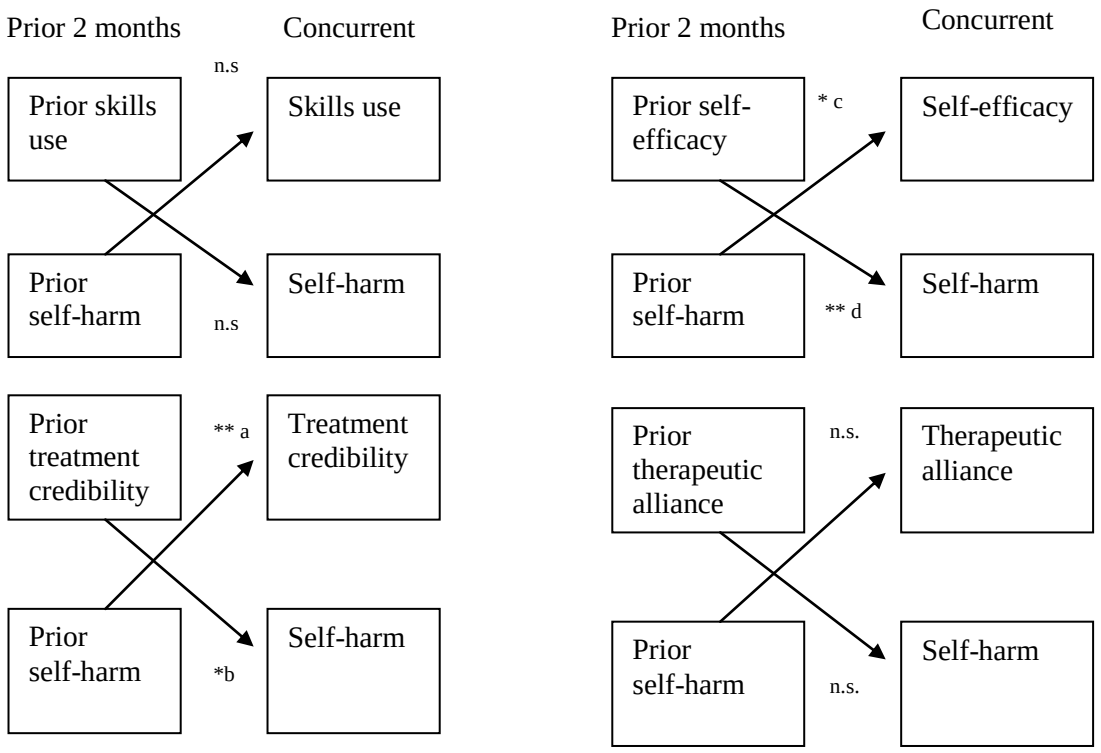
Table 3. Univariate and multivariate multi-level repeated measures models of the association between treatment process variables and the concurrent frequency of self-harm

Variable	Univariate models				Full multivariate model			
	N	n	Incidence rate ratio (95% confidence interval)	p value	N	n	Incidence rate ratio (95% confidence interval)	p value
BASELINE CHARACTERISTICS (time-invariant)[b]					69	256		
Female	70	384	3.22 (0.53 to 19.53)	0.20				
Age (years)	70	384	0.99 (0.94 to 1.05)	0.77				
In full-time employment	70	384	2.26 (0.71 to 7.20)	0.17				
Baseline BPD severity	69	379	1.11 (1.01 to 1.22)	0.04			1.02 (0.96 to 1.09)	0.54
Baseline self-harm frequency [c]	70	384	1.06 (1.04 to 1.08)	< 0.01			1.04 (1.02 to 1.07)	< 0.01
Comorbid post-traumatic stress disorder	70	384	2.55 (0.82 to 7.91)	0.10			2.23 (0.92 to 5.36)	0.07
Comorbid alcohol dependence	70	384	0.36 (0.13 to 1.07)	0.07			0.58 (0.21 to 1.60)	0.29
Comorbid substance dependence	70	384	1.36 (0.36 to 5.13)	0.65				
Comorbid major depressive disorder	70	384	0.84 (0.22 to 3.13)	0.79				
Prescribed psychiatric medication	70	384	0.78 (0.19 to 3.20)	0.73				
DBT SKILLS USE [d] (time-varying) [e]								
Frequency of DBT skills use (concurrent)	70	266	0.95 (0.93 to 0.98)	< 0.01			0.97 (0.94 to 0.99)	0.04
COMMON THERAPEUTIC FACTORS (time-varying)[e]								
Perceived credibility of DBT treatment (concurrent)	70	287	0.94 (0.87 to 0.99)	0.05			1.03 (0.95 to 1.12)	0.49
Therapeutic alliance with DBT therapist (concurrent)	70	286	0.98 (0.96 to 0.99)	< 0.01			0.98 (0.94 to 1.02)	0.29
Self-efficacy (concurrent)	70	355	0.94 (0.88 to 0.99)	0.05			0.91 (0.85 to 0.97)	< 0.01
TREATMENT COMPLETION								
DBT treatment completer	70	384	1.54 (0.45 to 5.34)	0.49			1.44 (0.58 to 3.55)	0.43

a Number of days with self-harm per 2 month period b Time-invariant = assessed at one point in time only c Number of days on which self-harm occurred in the 12 months prior to baseline. d Number of days in the past week on which each of 4 DBT skill-types were used. e Time-varying = assessed every 2 months over a 12 month period, where applicable, and modelled as repeated measures data . N = number of participants with data. n = number of available datapoints.

Figure 2. Cross-temporal univariate associations between treatment process variables and self-harm



a. β = -0.02, 95% C.I. -0.03 to -0.01, p = 0.02; b. I.R.R.= 0.93, 95% C.I. 0.85 to 1.01, p = 0.07;
c. β = -0.04 95% C.I. -0.09 to 0.01, p = 0.09; d. I.R.R. = 0.92, 95% C.I. 0.87 to 0.98, p = 0.02

The treatment process variables and the frequency of self-harm were assessed every 2 months over a 12 month period, where applicable, and modelled as repeated measures data . Concurrent = measured at the same two monthly timepoint as the dependent variable; Prior 2 months = measured at the prior two monthly timepoint to the dependent variable; n.s. = non-significant; * = $p < 0.10$; ** = $p < 0.05$; *** = $p < 0.01$; β = unexponentiated coefficient for linear dependent variables; I.R.R. = incidence rate ratio

3.6 Are DBT skills use, treatment credibility, the therapeutic alliance and self-efficacy independently associated with a lower probability of dropping out of treatment in the subsequent two months?

The univariate and multivariate associations between the treatment process variables and subsequent dropout are shown in Table 4. In univariate models, more frequent DBT skills use and a stronger therapeutic alliance predicted a lower likelihood of dropping out of treatment in the subsequent two months. There were trends in a similar direction for treatment credibility and self-efficacy. However, in the multivariate model simultaneously testing the association of all of the treatment process variables with dropout, more frequent DBT skills use at the prior two-month timepoint was the only treatment process variable that was independently associated with a lower likelihood of treatment dropout in the subsequent two months. There was no significant independent association between treatment credibility, the therapeutic alliance, or self-efficacy and subsequent dropout. The model was also adjusted for participants' sex, since males were more likely to drop out in univariate models.

Table 4. Univariate and multivariate multi-level repeated measures models of the association between treatment process

Table 4. Univariate and multivariate multi-level repeated measures models of the association between treatment process variables and subsequent drop-out[a] from DBT

Variable	Univariate models				Full multivariate model			
	N	n	Odds ratio (95% confidence interval)	p value	N	n	Odds ratio (95% confidence interval)	p value
BASELINE CHARACTERISTICS (time-invariant)[b]					69	223		
Female	70	420	0.09 (0.01 to 0.70)	0.02			0.23 (0.05 to 1.06)	0.06
Age (years)	70	420	1.00 (0.94 to 1.07)	0.90				
In full-time employment	70	420	0.44 (0.10 to 1.89)	0.27				
Baseline BPD severity	69	414	0.95 (0.85 to 1.06)	0.36				
Baseline self-harm frequency [c]	70	420	0.98 (0.95 to 1.02)	0.30				
Comorbid post-traumatic stress disorder	70	420	0.93 (0.24 to 3.60)	0.91				
Comorbid alcohol dependence	70	420	2.08 (0.53 to 8.24)	0.30				
Comorbid substance dependence	70	420	3.32 (0.79 to 14.0)	0.10				
Comorbid major depressive disorder	70	420	1.56 (0.32 to 7.60)	0.58				
Prescribed psychiatric medication	70	420	2.43 (0.48 to 12.2)	0.28				
DBT SKILLS USE [d] (time-varying) [e]								
Frequency of DBT skills use (2 months prior)	69	231	0.92 (0.87 to 0.97)	< 0.01			0.92 (0.86 to 0.98)	0.02
COMMON THERAPEUTIC FACTORS (time-varying)[e]								
Perceived credibility of DBT treatment (2 months prior)	70	306	0.94 (0.84 to 1.05)	0.26			1.03 (0.89 to 1.19)	0.72
Therapeutic alliance with DBT therapist (2 months prior)	70	251	0.97 (0.92 to 1.02)	0.22			0.99 (0.92 to 1.06)	0.70
Self-efficacy (2 months prior)	70	360	1.03 (0.96 to 1.10)	0.42			0.94 (0.87 to 1.01)	0.09

a Whether the participant had transitioned to dropout at each 2 month period ; b Time-invariant = assessed at one point in time only; c Time-varying = assessed every 2 months over a 12 month period, where applicable, and modelled as repeated measures data.; d Number of days in the past week on which each of 4 DBT skill-types were used; e 2 months prior = measured at the prior two monthly timepoint to the participant staying in or dropping out of DBT; N = number of participants with data. n = number of available datapoints.

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4. Discussion

4.1 Summary of the Main Findings

Higher levels of each of the treatment process variables at any timepoint were significantly associated with higher levels of each of the other treatment process variables.

4.1.1 DBT skills use

More frequent use of the DBT skills at any timepoint was associated with less frequent concurrent self-harm, independently of common treatment processes (treatment credibility, therapeutic alliance and self-efficacy). Conversely, participants who used the skills less often at any timepoint were more likely to drop out of DBT in the subsequent two months, independently of common treatment processes. However, prior skill use did not predict subsequent self-harm - nor vice versa.

4.1.2 Treatment credibility

Treatment credibility did not remain significantly associated with the concurrent frequency of self-harm, nor with the odds of dropping out of treatment, after adjusting for the other treatment processes. Less frequent self-harm at any timepoint was associated with higher ratings of treatment credibility at both the prior ($p < 0.05$) and the subsequent ($p < 0.10$) two-month time-point.

4.1.3 Therapeutic alliance

The therapeutic alliance did not remain significantly associated with the concurrent frequency of self-harm, nor with the odds of dropping out of treatment, after adjusting for the other treatment processes. Prior ratings of the therapeutic alliance did not predict subsequent self-harm - nor vice versa.

4.1.4 Self-efficacy

Higher self-efficacy at any timepoint was associated with less frequent concurrent self-harm, independently of other treatment processes (DBT skills use, treatment credibility and therapeutic alliance). Less frequent self-harm at any timepoint was associated with greater self-efficacy at both the prior ($p < 0.05$) and the subsequent ($p < 0.10$) two-month time-point. However, self-efficacy was not significantly associated with treatment dropout independently of the other treatment processes.

4.2 Interpretation of the Findings

This is the first study to show more frequent use of the DBT skills is associated with less frequent self-harm and with a lower likelihood of subsequent dropout, independently of the effect of common treatment processes. This suggests that any positive effect of DBT skills use on outcome is not solely because participants who use the skills more often also have a stronger sense of self-efficacy, find their treatment more credible or have a stronger therapeutic alliance. Skills use and self-efficacy were associated with less frequent self-harm even after adjusting for participants' baseline self-harm and BPD severity. This could imply that the findings are not just a spurious result of participants with less severe initial morbidity being more able to use the skills or having higher self-efficacy.

Our findings are in line with the contention of dialectical behaviour therapists that learning and using the DBT skills can directly help clients to stop self-harming, by enabling them to more effectively regulate their emotions and behaviour (Linehan, 1993a; Linehan, 1993b). Similarly, one interpretation of the association with staying in treatment is that skill use enables patients to tolerate distressing aspects of treatment rather than dropping out when challenges arise. However, there was no significant cross-temporal relationship between

skills use and self-harm in either direction, leaving the direction of the association unclear. Do participants self-harm less as a consequence of using the skills - or do participants who manage to reduce their self-harm attribute this to the skills, and consequently use the skills more? Alternatively, can the associations with self-harm and with subsequent dropout be attributed to a third unknown variable - such as waxing or waning commitment to the DBT programme? We find this explanation unlikely, since skills use remained predictive after adjusting for variables thought to reflect treatment commitment (treatment credibility and the therapeutic alliance), but cannot rule it out.

The findings are also consistent with previous research showing that self-efficacy is associated with positive outcomes in psychotherapy for other types of physical health and psychiatric disorders, including breast cancer, osteoarthritis, nicotine addiction, substance misuse, bulimia nervosa, spider phobia and social anxiety disorder (Benyon et al. 2010, Cote & Bouchard 2009, Goldin et al., 2012, Kadden & Litt 2011, Rottmann et al. 2010, Schnoll et al. 2011). According to Bandura and Cervone (1986), a person's sense of self-efficacy determines what challenges they undertake, how much effort they expend in attaining their goals, and how long they persevere in the face of difficulties. In DBT, it is possible that clients with higher self-efficacy are more willing, effortful and persevering in their goal of ending self-harming behaviours - and hence, ultimately more successful. The significant crosstemporal associations suggested that this could be a bidirectional relationship, with increases in self-efficacy leading to future reductions in self-harm, and reductions in self-harm leading to future increases in self-efficacy.

It is perhaps surprising that neither the therapeutic alliance nor treatment credibility were associated with self-harm or treatment completion, independently of skills use and self-

efficacy. The influence of these factors on outcome may be interdependent. Potentially, an important function of both the alliance and treatment credibility is to bolster clients' self-efficacy and to encourage them to persevere in using the skills to bring about change in their lives.

4.3 Strengths and Limitations

Strengths of the present research included the longitudinal design with frequent follow-up assessments, the evaluation of DBT in a real-world setting rather than a tightly controlled research setting, and the inclusion of participants with any comorbidity so that the sample resembled that seen in normal clinical practice, thus increasing the external validity of the findings. In addition, the use of multi-level modelling allowed the inclusion of individuals with data missing at some timepoints, which should reduce bias in the model estimates (Sterne, White, Carlin et al., 2009).

However, a limitation was that the measure of skills use relied on participants' familiarity with DBT terminology such as 'mindfulness' and 'distress tolerance'(although reminders of the names of the skills within each category were given). This meant that a comparative assessment of skill use in individuals receiving control treatments was not possible, and thus the mediating effect of skill use on the treatment effect itself could not be determined. Borderline personality disorder is characterised by unstable mood and self-perception, and all information provided by participants could have been affected by participants' current mood state – particularly the reporting of skills use and self-harm which were retrospective in nature. Additionally, data on treatment process variables could not be collected at all timepoints due to participants having a delayed start to the skills group, dropping out of therapy, or not attending research assessments. The treatment dropout rate of 46% was

notably higher than the average of 25% in a recent meta-analysis of dropout in evidence-based psychological treatments for BPD, in which dropout rates for DBT ranged from 11% to 64% (Barnicot et al. 2011), but is in line with another UK RCT of DBT which had a dropout rate of 58% (Feigenbaum et al. 2010) and comparable to other trials of DBT not conducted by the treatment developer (37% in Verheul et al. 2003, 38% in McMain et al. 2009, 43% in Clarkin et al. 2007). It has been suggested that healthcare systems such as the UK and Canada, in which alternative forms of intensive mental health support are comparatively easy to access from state-funded community mental health services, may provide less incentive for clients to complete the full course of treatment (Gaglia et al. 2013, McMain et al. 2009). It may also be difficult to generalise the findings to males since 90% of the sample were female – a common problem in research on borderline personality disorder as typically 75% of those diagnosed with BPD in treatment-seeking clinical samples are female (Widiger & Weissman 1991), despite equal prevalences among men and women in community samples (Torgenson et al. 2001). A further limitation is that the sample size was not sufficiently powered to allow the use of structural equation modelling, which would have enabled further elucidation of the direction of the association between the treatment process variables and self-harm.

4.4 Recommendations for Further Research

Further research on treatment processes in DBT should use structural equation modelling to disentangle the temporal ordering of the interrelationship between treatment process variables and treatment outcome. Skills use should be assessed with measures that do not use DBT-specific terminology, such as the Ways of Coping Checklist (Neacsiu, Rizvi, Vitaliano, Lynch & Linehan, 2010), and measured in the control arm participants of future randomised controlled trials in order to determine whether it mediates the effect of receiving DBT on self-harm and other outcomes. Further research should also evaluate what clinicians can do

to optimally support DBT clients to learn and use the skills, and to enhance their self-efficacy. Although the present study assessed general self-efficacy, we found that skills use and self-efficacy were positively associated and had only partially independent effects on outcome. Clinicians may therefore choose to focus their efforts on enhancing skills-related self-efficacy. In qualitative interviews, DBT clients have reported that learning the skills is easiest when skills group facilitators avoid the use of jargon and make skills training sessions funs and interactive. Clients also highlighted the role of support from other group members in overcoming barriers to skills training (Barnicot et al. 2015). Relatedly, Bandura (1986) suggests that clients' sense of self-efficacy can be enhanced by seeing others mastering similar difficulties to their own. Further research could test whether assigning new group members a skills coaching 'buddy' from amongst the more experienced group members, to provide encouragement and share their own experiences of learning and using the skills, could help clients to use the skills more effectively and to build up their self-efficacy.

More widely, to develop our understanding of the commonalities and differences in treatment processes between different models for BPD, it could be useful to determine whether treatment processes linked to particular therapy models are also active in others. For instance, it could be helpful to evaluate whether schema focussed therapy is as effective as DBT in enhancing clients' ability to use behavioural skills to regulate their emotions - or whether DBT decreases clients' belief in maladaptive schemas (Arntz et al. 1999). A further direction could be to identify whether particular client profiles may benefit more from the specific factors entailed in one treatment model than those in another. For example, some clients may benefit more than others from the increase in mentalizing capacity hypothesised to underlie mentalization based therapy (Bateman & Fonagy, 2006), whilst others may benefit more from the increase in emotional and behavioural control provided by the DBT skills.

4.5 Conclusions

The study provides evidence that DBT skills use and self-efficacy are each independently associated with less frequent self-harm in clients with BPD, whilst DBT skills use also independently predicts a lower likelihood of subsequently dropping out of treatment. Practising the DBT skills and building an increased sense of self-efficacy may be important and partially independent treatment processes in dialectical behaviour therapy. However, the direction of the association between these variables and self-harm requires further evaluation.

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6. References

Arntz et al. (1999). Assumptions in borderline personality disorder: specificity, stability and relationship with etiological factors. *Behaviour Research and Therapy* 37: 545–557.

Bandura, A. & Adams, N.A. (1977). Analysis of self-efficacy theory of behavioural change. *Cognitive Therapy and Research*, 1(4), 287-310.

Barnicot, K., Katsakou, C., Marougka, S.& Priebe, S.(2011). Treatment completion in psychotherapy for borderline personality disorder – a systematic review and meta-analysis. *Acta Psychiatrica Scandinavica, 123,* 327 – 338.

Barnicot, K., Katsakou, C., Bhatti, N., Savill, M., Fearns, N. & Priebe, S. (2012). Factors predicting the outcome of psychotherapy for borderline personality disorder: a systematic review. *Clinical Psychology Review 32(1),* 400-412.

Barnicot, K., Couldrey, L., Sandhu, S., Priebe, S. (2015). Overcoming Barriers to Skills Training in Borderline Personality Disorder: A Qualitative Interview Study. *PLOS One,* in press.

Bartlett, J. (2011). *Using REALCOM Impute and Stata.* http://missingdata.lshtm.ac.uk/index.php?option=com_content&view=article&id=49&Itemid=99.

Bateman, A. & Fonagy, P. (2006). *Mentalization-Based Treatment for Borderline Personality Disorder: A Practical Guide*. Oxford: Oxford University Press.

Bateman, A. & Fonagy, P. (2009). Randomized controlled trial of outpatient mentalization based treatment versus structured clinical management for borderline personality disorder. *American Journal of Psychiatry*, *166*, 1355 – 1364.

Bedics, J.D., Atkins, D.C., Harned. M.S., Linehan M.M. The therapeutic alliance as a predictor of outcome in dialectical behavior therapy versus non-behavioral therapy by experts for borderline personality disorder. *Psychotherapy*, 52(1), 67-77.

Benyon K, Hill S, Zadurian N & Mallen C (2010). Coping strategies and self-efficacy as predictors of outcome in osteoarthritis: A systematic review. *Musculoskeletal Care, 8*, 224–236.

Borkovec,T.D.& Nau, S.D. (1972) Credibility of analogue therapy rationales. *Journal of Behavior Therapy and Experimental Psychiatry, 3*, 257–260.

Carpenter, J.R., Goldstein, H. & Kenward, M.G. (2011). REALCOM-IMPUTE software for multilevel multiple imputation with mixed responses types. *Journal of Statistical Software, 45*, 1-14.

Clarkin, J.F., Levy, K.N., Lenzenweger. M.F. & Kernberg, O.F. (2007). Evaluating three treatments for borderline personality disorder: a multiwave study. *American Journal of Psychiatry, 164*, 922-928.

Côté & Bouchard S (2009). Cognitive mechanisms underlying virtual reality exposure. *Cyberpsychology and Behavior, 12*, 121–129.

Department of Health. *Refocusing the Care Programme Approach: Policy and Positive Practice Guidance.* London: Department of Health 2008.

Farrell, J.M., Shae, I.A.,& Webber, M.A. (2009). A schema-focused approach to group psychotherapy for outpatients with borderline personality disorder: A randomised controlled trial. *Journal of Behavior Therapy and Experimental Psychiatry, 40*, 317-328.

Feigenbaum, J.D., Fonagy, P., Pilling, S., Jones, A., Wildgoose, A. & Bebbington, P.E. (2011). A real-world study of the effectiveness of DBT in the UK National Health Service. *British Journal of Clinical Psychology, 51(2),* 121-141.

First, M.B., Gibbon, M., Spitzer, R.L., Williams, J.B.W. & Benjamin, L.S. (1997). *Structured Clinical Interview for DSM-IV Axis II Personality Disorders, (SCID-II).* Washington, D.C: American Psychiatric Press Inc.

Frank, J.D. & Frank, J.B. (1991). *Persuasion and Healing, 3rd edition*. Baltimore & London, The John Hopkins University Press.

Gaglia A, Essletzbichler J, Barnicot K, Bhatti N & Priebe S. (2013) Dropping out of Dialectical Behaviour Therapy in the NHS: The role of care co-ordination. *The Psychiatrist, 37*, 267-271.

Giesen-Bloo, J., Van Dyck, R., Spinhoven, P., van Tilberg, W., Dirksen, C., Van Asselt, T., Kremers, I., Nadort, M., Arntz, A. (2006). Outpatient therapy for borderline personality disorder: randomized trial of schema-focused therapy versus transference-focused therapy. *Archives of General Psychiatry, 63,* 649 – 1008.

Goldin, P.R., Ziv, M., Jazaieri, H., Werner, K., Kraemer, H., Heimberg, R.G., Gross, J.J. (2012). Cognitive re-appraisal self-efficacy mediates the effect of individual cognitive-behavioral therapy for social anxiety disorder. *Journal of Consulting and Clinical Psychology*, *80(6),* 1034-40. doi: 10.1037/a0028555.

Kirsch, I. & Henry, D. (1997). Extinction versus credibility in the desensitization of speech anxiety. *Journal of Consulting and Clinical Psychology*, *45*, 1052–1059.

Kliem, S., Kröger, C. & Kosfelder, J. (2010). Dialectical behaviour therapy for borderline personality disorder: A meta-analysis using mixed effects modelling. *Journal of Consulting and Clinical Psychology, 78(6),* 936-951.

Kadden RM & Litt MD (2011). The role of self-efficacy in the treatment of substance use disorders. *Addictive Behaviors, 36,* 1120–1126.

Linehan, M.M. (1993a). *Cognitive-behavioral treatment of borderline personality disorder*. New York: Guilford Press.

Linehan, M.M. (1993b). *Skills training manual for treating borderline personality disorder*. New York: Guilford Press.

Linehan, M.M. (1996). SASII Instructions and Cards. From depts..washington.edu/brtc/files/SASII%20Instructions.pdf

Linehan MM, Comtois KA, Brown MZ, Heard HL, Wagner A (2006). Suicide Attempt Self-Injury Interview (SASII): development, reliability and validity of a scale to assess suicide attempts and intentional self-injury. Psychological Assessment 18(3):303-12.

Linehan, M.M., Comtois, K.A., Murray, A.M., Brown, M.Z., Gallop, R.J., Heard, H.L., Korslund, H.E., Tutek, D.A., Reynolds, S.K. & Lindenboim, N. (2006). Two-year randomized controlled trial and follow-up of dialectical behaviour therapy versus therapy by experts for suicidal behaviours and borderline personality disorder. *Archives of General Psychiatry, 63*, 757-766.

McGuire-Snieckus, R., McCabe, R., Catty, J., Hansson, L. & Priebe, S. (2007). A new scale to assess the therapeutic relationship in community mental health care: STAR. *Psychological Medicine, 37*, 85-95.

McMain, S.F., Links, P.S., Gnam, W.H., Guimond, T., Cardish, R.J., Korman, L. & Streiner, D.L. (2009). A randomized trial of dialectical behaviour therapy versus general psychiatric management for borderline personality disorder. *American Journal of Psychiatry*, *166*, 1365 – 1374.

Neacsiu, A.D., Rizvi, S.L. & Linehan, M.M. (2010). Dialectical behavior therapy skills use as a mediator and outcome of treatment for borderline personality disorder. *Behaviour Research and Therapy, 48*, 832-839.

Neacsiu, A.D., Rizvi, S.L., Vitaliano, P.P., Lynch,T.R. & Linehan, M.M. (2010). The dialectical behavior therapy ways of coping checklist (DBT-WCCL): development and psychometric properties. *Journal of Clinical Psychology, 66*, 563-582..

Priebe, S., Bhatti, N., Barnicot, K., Bremner, S., Gaglia, A., Katsakou, C., Molosankwe, I., McCrone, P. & Zinkler, M. (2012). Effectiveness and cost-effectiveness of dialectical behaviour therapy for self-harming patients with personality disorder: a pragmatic randomised controlled trial. *Psychotherapy and Psychosomatics, 81(6),* 356-365.

Rabe-Hesketh, S. & Skrondal, A. (2012). *Multilevel and Longitudinal Modeling Using Stata*. Texas, U.S.A.: Stata Press.

Rizvi SL, Steffel LM & Carson-Wong A. (2013). An overview of dialectical behavior therapy for professional psychologists. *Professional Psychology Research and Practice*, 44(2), 73-80.

Rottmann N, Dalton SO, Christensen J, Frederiksen K & Johansen C. (2010). Self-efficacy, adjustment style and well-being in breast cancer patients: A longitudinal study. *Quality of Life Research, 19*, 827–836.

Schnoll RA, Martinez E, Tatum KL, Glass M, Bernath A, Ferris D & Reynolds P (2011). Increased self-efficacy to quit and perceived control over withdrawal symptoms predict smoking cessation following nicotine dependence treatment. Addictive Behaviors, 36, 144–147.

Schwarzer, R., Bäßler, J., Kwiatek, P., Schröder, K., & Zhang, J. X. (1997). The assessment of optimistic self-beliefs: Comparison of the German, Spanish, and Chinese versions of the General Self-Efficacy Scale. *Applied Psychology: An International Review, 46* (1), 69-88.

Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston (Eds.), *Measures in health psychology: A user's portfolio. Causal and control beliefs* (pp. 35-37). Windsor, England: NFER-NELSON.

Sheehan, D.V., Lecrubier, Y., Sheehan, K.H., Amorim, P., Janavs, J., Weiller, E., Hergueta, T., Baker, R. & Dunbar, G.C.L. (1998). The Mini International Neuropsychiatric Interview (M.I.N.I): The development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *Journal of Clinical Psychiatry*, 59(20), 22-33.

StataCorp (2009). *STATA/SE , version11*. StataCorp LP, College Station, Texas 77845, U.S.A.

Stepp, S.D., Epler, A.J., Jahng, S. & Trull, T.J. (2008). The effect of dialectical behavior therapy skills use on borderline personality disorder features. *Journal of Personality Disorders, 23(6)*, 549-563.

Sterne, J.A.C., White, I.R., Carlin, J.B., Spratt, M., Royston, P., Kenward, M.G., Wood, A.M. & Carpenter, J.R. (2009). Multiple imputation for missing data in epidemiological and clinical research: potential and pitfalls. *British Medical Journal*, 338, b2393.

Stoffers, J.M., Völlm, B.A., Rücker, G., Timmer, A.,Huband, N. & Lieb, K. (2012). Psychological therapies for people with borderline personality disorder. CochraneDatabase of Systematic Reviews, 8, Art.No.:CD005652.DOI: 10.1002/14651858.CD005652.pub2

Swales M.A., Taylor, B. & Hibbs,R.A.B. (2012). Implementing dialectical behavior: Programme survival in routine healthcare settings. *Journal of Mental Health*, 21(6), 548-555.

Sweeney A, Fahmy S, Nolan F, Morant N, Fox Z, Lloyd-Evans B, Osborn D, Burgess E, Gilburt H, McCabe R, Slade M, Johnson S (2014). The relationship between therapeutic alliance and service user satisfaction in mental health inpatient wards and crisis house alternatives: a cross-sectional study. PLOS One 9(7):e100153doi:10.1371/journal.pone.0100153

Verheul, R., Van den Bosch, L.M.C., Koeter, M.W.J., De Ridder, M.A.J., Stijnen, T. & Van den Brink, W. (2003). Dialectical behaviour therapy for women with borderline personality disorder: 12 month, randomised trial in the Netherlands. *British Journal of Psychiatry, 182*, 135-140.

Wampold, B.E. (2001). *The Great Psychotherapy Debate: Models, Methods and Findings.* New Jersey & London: Lawrence Erlbaum Associates

Zanarini, M.C. Vujanovic, A.A., Parachini, E.A., Boulanger, J.L., Frankenburg, F.R. & Hennen, J. (2003). Zanarini rating scale for borderline personality disorder (ZAN-BPD): A continuous measure of DSM-IV borderline psychopathology. *Journal of Personality Disorders*, 17(3), 233-24.