

# Implementing dialectical behaviour therapy in routine practice: an evaluation of a national CAMHS DBT service for adolescents

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## Abstract

Self-harming behaviours are reported to be increasing amongst young people and are associated with increased risk of suicide. The recently published UK clinical guidelines highlight that cross-sector awareness and early psychosocial assessment of self-harming is necessary, alongside careful triaging as to the level of support required. Dialectical behaviour therapy for adolescents (DBT-A) is a recommended intervention for young people with more severe difficulties. The current study aims to contribute to the data available to inform ongoing clinical decisions about the feasibility and implementation of DBT-A by reporting the intervention method, participant characteristics, and clinical outcomes of a national (UK) DBT service for young people with high levels of need and risk. Young people who commenced treatment between 2015 and 2021 were included. Completion rates, reasons for non-completion, and discharge pathways are reported. Measurement and changes in outcomes, including self-harm, in-patient bed days, accident and emergency department attendances and education/work status, are reported, as well as for routine outcome measures assessing emotion dysregulation and symptoms of emerging borderline personality disorder, depression and anxiety. The clinical significance of these outcomes are considered. Ideas for service evaluation, which are feasible and replicable in busy clinical settings are proposed, as well as a discussion of potential adaptations to standardised protocols needed in this context to fit with National Health Service (NHS) resources and the needs of the target population.

## Key learning aims

- (1) To learn about the implementation of dialectical behaviour therapy (DBT) and concurrent outcome monitoring in a UK National Health Service CAMHS out-patient setting.
- (2) To understand the clinical profile and response to treatment of young people with high levels of suicidal and non-suicidal self-harming behaviours.
- (3) To present a potential method for outcome monitoring and collection for CAMHS DBT services.

**Keywords:** Adolescents; Dialectical behaviour therapy; Emotion dysregulation; Self-harm; NHS

## Introduction

Suicide and non-suicidal self-harm rates in young people are on the rise in the UK, raising questions about how to respond effectively to support young people's wellbeing (McManus *et al.*, 2019; Office of National Statistics, 2019). Many, although not all, young people who engage in

self-harming behaviours are seen while in crisis by emergency services, which comes at a considerable cost to the National Health Service (NHS; Tsiachristas *et al.*, 2017). Adolescents discharged from emergency hospital admissions remain at subsequent risk of self-harm and re-admission (Herbert *et al.*, 2015). This suggests that despite the costly nature of emergency care, these may not be the most effective long-term interventions for self-harm – thus highlighting the need for more effective early detection and community-based interventions (National Institute for Health and Care Excellence, 2022).

Dialectical behaviour therapy (DBT; Linehan, 1993) is a ‘third-wave’ cognitive behavioural intervention originally developed for the treatment of highly suicidal adults with symptoms associated with borderline personality disorder (BPD). These symptoms include instability in emotion regulation, impulse control, interpersonal relationships, and suicidal and non-suicidal self-harming behaviours (Bohus *et al.*, 2021). Within adult populations, DBT has demonstrated effectiveness in reducing self-harming behaviours (Panos *et al.*, 2013) and psychiatric hospitalisations (DeCou *et al.*, 2019). DBT has also been adapted for adolescents (DBT-A; Miller *et al.*, 2006; Rathus and Miller, 2015). DBT-A is recommended by the National Institute for Health and Care Excellence (2022) for adolescents with self-harming behaviours and difficulties associated with emotion dysregulation. The National Institute for Health and Care Excellence (2022) also highlight that cross-sector awareness and early psychosocial assessment of self-harm is necessary, alongside careful triaging as to the level of support required. Considerations remain as to who requires this intensity of intervention and the feasibility of its application in routine healthcare contexts.

While DBT for adults is often associated with the treatment of BPD symptoms, when applied to adolescent populations, DBT-A opts to describe difficulties in the context of emotion dysregulation without inferences regarding BPD (Miller *et al.*, 2006; Rathus and Miller, 2015). BPD is not typically diagnosed with diagnostic manuals in those under 18 years old. There is understandable hesitance to associate specific struggles for adolescents with this label, as personality is still developing and to protect against the potential stigma and criticisms related to the BPD construct (Kaess *et al.*, 2014; Klein *et al.*, 2022; National Collaboration Centre for Mental Health, 2009; Swales, 2022). However, emerging BPD symptoms in adolescents are associated with an increased likelihood of long-term difficulties with BPD and high costs to young people’s health (Chanen *et al.*, 2017; Winograd *et al.*, 2008). Early identification of BPD symptomatology may therefore yield more access to effective interventions with the aim of preventing longer-term mental health difficulties (Chanen *et al.*, 2017; Miller *et al.*, 2008).

The studies supporting DBT-A have shown promising results for reducing self-harm compared with general interventions (see Johnstone *et al.*, 2021 and Kothgassner *et al.*, 2021 for reviews). Three randomised controlled trials (RCT) suggest that DBT is superior to control interventions in reducing self-harm behaviours and symptoms of depression, as well as improving global functioning at the end of treatment (Mehlum *et al.*, 2014; McCauley *et al.*, 2018; Santamarina-Perez *et al.*, 2020). Much of the research reporting on DBT in adolescent populations has constituted controlled studies conducted by the treatment developers. One naturalistic UK study has investigated clinical outcomes of DBT within UK child and adolescent mental health services (CAMHS). James *et al.* (2008) found that the 16 young people who underwent their DBT programme within an NHS setting had improvements in depression symptoms, hopelessness, self-harm, and global functioning at the end of treatment. Naturalistic evaluations of DBT-A and DBT in public health programmes and similar contexts can be found in other countries and show similar reductions in outcomes (Ben-Porath *et al.*, 2004; Comtois *et al.*, 2007; Gaglia *et al.*, 2013; Gillespie *et al.*, 2019; Turner, 2000; see MacPherson *et al.*, 2012 for a review). Insight into the implementation of DBT within applied CAMHS in the UK NHS contributes to the evidence base for DBT outcomes in clinical settings and considerations of feasibility of implementation.

The publication of the recent National Institute for Health and Care Excellence (2022) guidelines and the inclusion of DBT-A may mean there are renewed commissioning considerations about DBT-A provision in NHS CAMHS in response to the increasing

prevalence of self-harm and suicide in adolescent populations (McManus *et al.*, 2019; Office of National Statistics, 2019). We therefore intended to publish data on the implementation of DBT in a naturalistic NHS CAMHS clinical setting to support commissioning and service development discussions. The current study aims to contribute by reporting the intervention method, participant characteristics, and clinical outcomes obtained in the first published evaluation of a Tier 4 national (UK) CAMHS DBT service which receives referrals for young people with high levels of need and risk. A description of the CAMHS DBT Service as it has been implemented within an NHS setting is provided in the Method section. This study also sought to report on the characteristics of those who complete DBT, those who opt out before completion, and those who do not sign up to DBT after the pre-treatment period. Finally, this study details a potential method for collecting relevant clinical outcome data and presents the changes in these outcomes by the end of DBT, with a larger sample, a wider range of outcomes, and the inclusion of a substantive parent/carer intervention component compared with the previous naturalistic CAMHS DBT study based in the UK NHS (*i.e.* James *et al.*, 2008).

## Method

### *The treatment model*

The National and Specialist CAMHS, DBT Service is a Tier 4 NHS out-patient DBT programme for adolescents. Tier 4 CAMHS are highly specialist and intensive interventions that often include in-patient services, home intervention, and intensive out-patient programmes (NHS England, 2018). Before being referred to Tier 4 services in England, it is required that children and adolescents received, but have not responded to, interventions at Tiers 1 to 3 (NHS England, 2018). Referrals to the DBT service are received up to the age of 17 years and 2–4 months (depending on service capacity) from CAMHS nationally (UK) if difficulties with self-harm and emotion dysregulation are indicated. Referrals are often made after local services' attempts at meeting the young persons' needs have been exhausted. A pre-treatment period of up to six sessions are offered to those who meet criteria at assessment. Pre-treatment is intended to build commitment to DBT, identify therapy goals, and support young people to decide if this is the right time and therapy for them (Linehan, 1993). The young person then decides whether to opt into the full treatment programme.

If young people sign up to the programme, they are allocated an individual therapist, alongside a separate DBT case manager and parent/carer worker who works with parents/carers and the professional network, in consultation with the young person. The treatment programme includes once-weekly individual therapy sessions, 6 months of once-weekly DBT skills group, and between-session telephone skills coaching (Monday to Friday, 9 a.m. to 5 p.m.). The DBT skills group includes three 6-session modules (distress tolerance, emotion regulation, and interpersonal effectiveness; Rathus and Miller, 2015). The first session of each module is focused on mindfulness. 'Walking the Middle Path' skills are imbedded throughout each module (Rathus and Miller, 2015). The group sessions are shorter in duration (1.5 hours each) compared with those detailed in the DBT-A model (2 hours; Rathus and Miller, 2015) in line with service user feedback throughout the service implementation. Telephone coaching is limited to Monday to Friday, 9 a.m.–5 p.m. due to local resource restrictions meaning it is not possible to offer 24-hour phone support. Instead, young people and their parents/carers are directed to a local crisis line outside of these hours, whose clinicians are trained and supervised in DBT-informed approaches. The rule that young people are not able to access telephone coaching for 24 hours if they engaged in a life-threatening behaviour (Linehan, 1993) was implemented for DBT telephone coaching but not for out-of-hours crisis line support.

Congruent with considerations by Rathus *et al.* (2018), young people were offered up to 12 months of treatment in response to the severity of difficulties in this specialist Tier 4 setting,

which is longer than the duration of DBT-A investigated in the RCTs (16–24 weeks; Mehlum *et al.*, 2014; McCauley *et al.*, 2018; Santamarina-Perez *et al.*, 2020). During this implementation period, young people were care coordinated by this DBT programme. Local CAMHS services were requested to attend review meetings and support with transition to ongoing mental health services if necessary. Young people opted out of the programme before completion if they missed either four individual sessions or four skills groups consecutively, in line with the DBT model (Linehan, 1993).

The individual and parent/carer treatment model is derived from the adult and adolescent DBT frameworks (Linehan, 1993; Rathus *et al.*, 2018; Rathus and Miller, 2015) and the DBT for families model (Fruzzetti, 2019). Parents/carers were offered tailored individual sessions and family sessions with their young person as needed (Fruzzetti, 2019), alongside telephone coaching and a separate 6-month-long parent/carer skills group (1.5 hours per group). Limitations in facilities/space available for therapy, alongside a preponderance of young people not consenting for joint groups with their parents/carers, have contraindicated a multi-family skills group approach in this setting that are used in some RCTs (Mehlum *et al.*, 2014; McCauley *et al.*, 2018), but not others (Santamarina-Perez *et al.*, 2020). The parent/carer skills group includes a focus on facilitating peer support, the biosocial transactional model, validation, relationship and core mindfulness, dialectics, reinforcement of behaviour, and time dedicated to teaching the core skills taught to the young people (Fruzzetti, 2019; Rathus and Miller, 2015; see Smith *et al.* (2023) for details of this particular parent/carer group).

All DBT therapists at the service inception completed intensive training (i.e. at least 10 days of training by a licensed DBT training provider) in DBT. Later therapists to join the service completed at least (5-day) foundational training in DBT by a licensed provider and went on to complete further training over time. DBT therapists also attended a weekly half-hour teaching slot to increase and maintain therapeutic skills in DBT and related areas. Therapist support and checks on adherence to the DBT model were provided via weekly clinician consultation meetings, individual supervision, and quarterly consultation with an external expert in DBT.

### Sample

Referrals were accepted for treatment if the person was between the ages of 13 years and 17 years and 2–4 months (depending on service capacity); had at least one episode of self-harm in the past 6 months; and presented with symptoms in at least a further four domains of emerging BPD, as assessed by the Structured Clinical Interview for DSM-IV, BPD subscale (SCID-BPD; First *et al.*, 1997). Exclusion criteria were: a primary diagnosis of schizophrenia/psychosis, substance-use dependency, or psychiatric disorder(s) that required more urgent assessment or treatment, or that the individual had opted out of the programme in the past 3 months. While young people needed one episode of self-harm to meet inclusion criteria, due to the referral pathways to access Tier 4 specialist services, often young people would be referred only after needs were not able to be met by lower-tiered services and when severity of distress and risk was significantly higher. All young people referred had a recent history of frequent suicidal and non-suicidal self-harm. Data within this study covers the period between April 2015 and April 2021.

### Design and procedure

The outcomes collected by the service included changes in self-harm (suicidal and non-suicidal), occupied in-patient bed days and accident and emergency (A&E) attendances due to mental health crises, and education/work status. These outcomes were collected weekly during DBT via the participants' DBT diary cards and reports in individual sessions, which were corroborated with reports from parents/carers, other professionals, and NHS records. A&E attendance and occupied in-patient bed days prior to treatment were collected from NHS records. Participants

also completed routine outcome measures and a sociodemographic self-report questionnaire at assessment and at the end of treatment, initially in paper questionnaires and latterly (2018 onwards) via online questionnaires administered via a tablet device in face-to-face sessions at assessment and either face-to-face/online sessions or via self-administration on their own devices at the end of treatment. These were completed with an assistant psychologist at the assessment time-point and, depending on participant preference, were completed alone or with an assistant psychologist at discharge. On rare occasions where there was clinical need to do so, DBT therapists would have completed measures with participants instead of an assistant psychologist. Routine outcome measures included measures of emotion dysregulation and symptoms of emerging BPD, depression and anxiety. Data on treatment completion, post-discharge destinations, and reasons for opting out before treatment completion were collated from service records.

### Outcome measures

#### *Self-harm, A&E, bed days, and education/work status*

Count frequencies of suicidal and non-suicidal self-harm (collated as one category), attendances to A&E departments and in-patient bed days due to mental health crises or for risk management, and whether the young person was in training, education, or employment or not were recorded.

#### *Routine outcome measures*

*Emotion dysregulation* was measured by the Difficulties in Emotion Regulation Scale (Gratz and Roemer, 2004), a 36-item self-report measure of six facets of emotion regulation difficulties. The six subscales include: non-acceptance of emotional responses, difficulties in engaging in goal directed behaviour, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. Higher scores indicate greater difficulties in emotion regulation. As no cut-offs have been developed for this measure, this study conducted a ROC analysis (Hajian-Tilaki, 2013) on all young people assessed by the DBT service (between April 2015 and April 2021) to determine a cut-off for predicting whether participants met diagnostic threshold for BPD on the clinician-rated SCID-BPD at assessment, in order to inform interpretation of the results. The results suggest a score of 128 or above ( $ROC = .71$ ) and had adequate sensitivity (70%) and specificity (67%). Studies have evidenced good internal consistency, test-re-test reliability, and predictive and construct validity (Gratz and Roemer, 2004; Neumann *et al.*, 2010; Weinberg and Klonsky, 2009).

*Emerging BPD symptoms* were measured in self-report format via the McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD; Zanarini *et al.*, 2003) and the Borderline Evaluation of Severity over Time (BEST; Pfohl *et al.*, 2009). The MSI-BPD is a 10-item self-report screening measure of the DSM-IV BPD criteria, with a 'yes' (1), 'no' (0) response format. Higher scores indicate the presence of more BPD symptoms and a screen is regarded as positive with a total score of 7 or above. The MSI-BPD has been found to have good diagnostic efficiency in young people and good test-re-test reliability and internal consistency (Zanarini *et al.*, 2003). The BEST is a 15-item self-report scale designed to measure severity and change of BPD symptoms. It consists of three scales with 5-point Likert response formats: the 'negative' thoughts and feelings subscale, the 'negative' behavioural symptoms of BPD subscale, and the 'positive' behaviours/skills acquisition subscale. A total severity of problems score, with a range of 12 (best) to 72 (worst), is calculated by subtracting the positive scale from a sum of the 'negative' scales, with a correction factor of 15. As no cut-offs have been developed for this measure, this study conducted a ROC analysis using the same procedure as the DERS to determine a cut-off for predicting whether participants met diagnostic threshold for BPD to inform interpretation of the results. A score of 42 or above ( $ROC = .83$ ) had good sensitivity (82%) and specificity (81%). Studies suggest that the BEST has high internal consistency, discriminant validity, and is sensitive to clinical change (Blum *et al.*, 2002; Pfohl *et al.*, 2009).

*Depression symptoms* were measured using the Moods and Feelings Questionnaire for Young People (MFQ-YP; Angold and Costello, 1987). The MFQ is a 33-item self-report measure of depressive symptoms in young people, with scores ranging from 0 to 66. Scores above 28 are suggestive of the presence of ‘major depression’ (Daviss *et al.*, 2006). The MFQ has good internal consistency, test–re–test reliability, and construct validity (Daviss *et al.*, 2006).

*Anxiety symptoms* were measured by the Screen for Child Anxiety-Related Emotional Disorders for Young People (SCARED-YP; Birmaher *et al.*, 1999). The SCARED is a 41-item self-report instrument used to screen for anxiety disorders in young people. A total score of 25 out of a possible 82 may indicate the presence of an anxiety disorder. The SCARED has good internal consistency, test–re–test reliability, and construct validity (Birmaher *et al.*, 1999).

*The sociodemographic questionnaire* included questions regarding the young persons’ age, ethnicity, sex assigned at birth, and gender identity. Sexual orientation questions were added in 2018 and had options for ‘prefer not to say’ and ‘prefer to self-describe’ with a free-text box.

### Data analysis

Data were analysed in SPSS (IBM, version 27). All outcomes were analysed using intention-to-treat analysis (ITT) for all who started DBT (not including those who opted out before signing up to DBT in pre-treatment), where possible. Self-harm was examined as percentage of weeks free from self-harm in pre-treatment and treatment split into four quartiles, and the count of incidents in the first (including pre-treatment) and last 8 weeks of treatment due to the varied treatment length. Counts of in-patient bed days and A&E attendances were collated during treatment (excluding pre-treatment) and the treatment-matched period before treatment. As the continuous aforementioned count outcomes violated the assumptions of parametric tests, these were analysed using the Wilcoxon signed-rank test (WSRT) for two groups or Friedman’s two-way analysis of variance omnibus test for more than two groups, with the WSRT (Bonferroni correction) for *post-hoc* comparisons. Categorical outcomes were analysed using the McNemar’s change test. Spearman’s correlations were used to investigate the relationship between changes in the primary outcomes (T1–T2) and age and treatment length. Missing data for self-harm, A&E attendance, bed days, and education/work status outcomes was 4.51% for completers and 12.43% for those who opted out after starting treatment.

Changes in the routine outcome measure data from the first to last time point did not violate the assumptions of parametric tests and thus were analysed using paired-samples *t*-tests and Pearson correlations to explore the relationship between age, treatment length, and changes in outcomes (T1–T2). Differences between groups in symptoms and sociodemographics at baseline were analysed using chi-square for categorical variables, Mann–Whitney *U*-tests where there were two independent groups and a continuous dependent variable (which violated the assumptions of parametric tests), and one-way ANOVAs with *post-hoc* comparisons (Tukey’s) for continuous variables between three groups (which did not violate the appropriate assumptions). Missing data across routine outcome measures was 7.14% for treatment completers and 52.93% for those who opted out during DBT. Up to six of the 39 who opted out during DBT had sufficient data to be included in the ITT analysis of secondary outcomes. Missing data across analyses were managed using pairwise deletion.

### Results

Between April 2015 and April 2021, 182 young people started DBT pre-treatment, 27 opted out in pre-treatment and 39 opted out during treatment before completion (average treatment length = 4.59 months, *SD* = 2.14). Thus, 116 completed treatment (average treatment length = 10.75 months, *SD* = 1.97). Majority reasons for opting out of the programme included: conflict between therapy-time commitment and other commitments such as work/

education (pre-treatment = 37%, treatment = 15%), self- and system-perceived improvements (pre-treatment = 22%, treatment = 12%), travel/distance to clinic (pre-treatment = 19%, treatment = 10%), in-patient status (pre-treatment = 15% remained inpatient, treatment = 8% greater than 4-week admissions), difficulties with skills group (treatment = 21%), or unable to make contact after missing four sessions and thus out of the programme (treatment = 15%). Of the young people who were discharged from the service having completed treatment, <1% continued treatment with another Tier 4 service, 75% returned to Tier 3 CAMHS or equivalent adult mental health services, and 25% were discharged to primary care.

See Table 1 for sociodemographic variables and symptoms at baseline for those who completed DBT and those who opted out in pre-treatment and treatment. See Supplementary material for a further breakdown of sociodemographic variables and symptoms at remaining time points for groups based on treatment completion. A significantly higher proportion of looked after young people (LAC) opted out in pre-treatment compared with those who opted out during or completed treatment (see Table 1). According to *post-hoc* comparisons (ANOVA), those who opted out in treatment had significantly higher assessment scores on the DERS impulse ( $p < .01$ ,  $p = < .01$ ) and non-acceptance subscales ( $p = < .01$ ,  $p = .04$ ), DERS total score ( $p = < .01$ ,  $p = < .05$ ), BEST 'negative' behaviours subscale ( $p = < .01$ ,  $p = < .01$ ), and BEST total score ( $p = .04$ ,  $p = .01$ ) compared with those who opted out in pre-treatment and treatment completers, respectively; those who opted out in treatment had significantly higher assessment scores on the MSI-BPD ( $p = < .01$ ) and DERS clarity ( $p = < .01$ ) compared with those who opted out in pre-treatment; and those who completed treatment had significantly higher assessment scores on the BEST 'positive' behaviour subscale compared with those who opted out in pre-treatment ( $p = .03$ ) and treatment ( $p = .03$ ; see Table 1 for descriptive statistics and ANOVA omnibus statistics).

There were significant improvements in self-harm, occupied in-patient bed days, A&E attendances, and education and work status, by the end of treatment (see Table 2). Pairwise comparisons found that percentage of self-harm-free weeks in pre-treatment were significantly lower than in quarter (Q) 1 ( $Z = -2.87$ ,  $p = .04$ ,  $r = -.24$ ), Q2 ( $Z = -4.88$ ,  $p = < .01$ ,  $r = -.42$ ), Q3 ( $Z = -6.47$ ,  $p = < .01$ ,  $r = -.55$ ) and Q4 ( $Z = -7.46$ ,  $p = < .01$ ,  $r = -.64$ ) with small to large effect sizes. Percentage of self-harm-free weeks in Q1 was significantly higher compared with Q2 ( $Z = -3.49$ ,  $p = < .01$ ,  $r = -.30$ ), Q3 ( $Z = -5.45$ ,  $p = < .01$ ,  $r = -.46$ ) and Q4 ( $Z = -6.66$ ,  $p = < .01$ ,  $r = -.57$ ) with medium to large effect sizes. Percentage of self-harm-free weeks in Q2 was significantly lower compared with Q3 ( $Z = -3.61$ ,  $p = .01$ ,  $r = -.31$ ) and Q4 ( $Z = -5.19$ ,  $p = < .01$ ,  $r = -.44$ ) with medium effect sizes. Percentage of self-harm-free weeks in Q3 was not significantly different from Q4 ( $Z = -2.33$ ,  $p = .20$ ,  $r = -.20$ ). Treatment length had a small positive significant correlation with changes in the count of self-harm in the first compared with the last 8 weeks of DBT, but with no other outcomes (see Table 3).

There was a statistically significant reduction in all routine outcome measures between the start and end of treatment (see Table 4). Treatment length had a small positive significant correlation with change scores on the DERS Goals subscale and with the changes in the frequency of self-harm, but with no other outcomes (see Table 3).

## Discussion

This study reports on the service model, implementation, participant characteristics, and clinical outcomes from a national CAMHS DBT programme for adolescents within a UK NHS setting. The findings are considered applicable to clinical health-care contexts and implementation. As seen in this service implementation, some adaptations to DBT might be required to fit with the resources and requirements for different health care models, countries, and cultures (e.g. Ramaiya *et al.*, 2017), as well as to meet the heterogeneous needs of clinical populations with complex needs. This raises important clinical questions about fidelity to evidence-based treatment models

**Table 1.** Baseline differences between completers and those who opted out

	Completers	Opt out in pre-treatment	Opt out in treatment	$\chi^2$
	Frequency (%)	Frequency (%)	Frequency (%)	
Sex (ref female)	110 (94.80%)	27 (100%)	38 (97.40%)	1.81
Gender identity (ref cis-gender)	71 (88.80%)	24 (88.90%)	37 (94.90%)	1.22
Sexual orientation <sup>a</sup> (ref heterosexual)	29 (46.80%)	4 (28.60%)	6 (42.90%)	1.54
Ethnicity (ref white ethnicities)	90 (77.60%)	19 (76.00%)	30 (85.70%)	1.23
LAC (ref LAC)	7 (6.00%)	8 (29.60%)	3 (7.70%)	<b>13.95**</b>
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>F</i>
Age	16.49 (0.91)	16.83 (0.77)	16.38 (1.20)	1.88
SCID-BPD	6.37 (1.75)	5.92 (1.96)	6.79 (1.75)	1.70
MSI-BPD	8.23 (1.75)	7.44 (2.08)	8.84 (1.52)	<b>4.74*</b>
BEST				
Thoughts & Feelings	28.64 (5.87)	27.55 (5.69)	31.12 (5.84)	<b>3.07*</b>
Behavioural Symptoms	11.65 (3.46)	10.45 (4.30)	14.18 (3.40)	<b>8.77**</b>
Positive Behaviours	8.02 (2.58)	6.55 (2.72)	6.76 (2.08)	<b>5.35**</b>
Total	47.40 (9.58)	46.45 (9.16)	53.09 (10.90)	<b>4.80**</b>
DERS				
Non-acceptance	21.07 (6.02)	17.40 (7.09)	24.25 (5.06)	<b>6.70**</b>
Goals	21.39 (3.53)	19.87 (3.64)	21.79 (3.28)	1.57
Impulse	21.85 (5.51)	19.13 (5.69)	25.39 (4.67)	<b>7.59**</b>
Awareness	21.22 (4.18)	21.00 (5.46)	20.86 (4.70)	0.08
Strategies	31.25 (6.18)	29.67 (6.43)	32.54 (4.45)	1.18
Clarity	17.08 (3.87)	15.87 (3.40)	18.89 (3.66)	<b>3.72*</b>
Total	133.68 (20.49)	122.93 (24.30)	143.71 (14.89)	<b>5.58**</b>
MFQ	44.96 (11.84)	46.10 (9.09)	47.53 (10.94)	0.72
SCARED	47.34 (15.22)	46.86 (12.62)	53.51 (15.53)	2.58
	<i>Mdn (range)</i>	<i>Mdn (range)</i>	<i>Mdn (range)</i>	<i>U</i>
% Self-harm-free weeks, pre-treatment	67% (0–100%)	—	71% (17–100%)	1887.00
Count of self-harm (first 8 weeks)	4.00 (0.00–108.00)	—	3.00 (0.00–10.00)	1483.50
Occupied in-patient bed days <sup>b</sup>	1.00 (0.00–365.00)	—	0.00 (0.00–365.00)	1834.50
A&E attendances <sup>b</sup>	1.00 (0.00–10.00)	—	1.00 (0.00–7.00)	1795.50

\*Significance level &lt;.05, two-tailed.

\*\*Significance level &lt;.01, two-tailed.

<sup>a</sup>Questions regarding sexual orientation were added in 2017;<sup>b</sup>in the matched period before treatment.LAC, looked after child; SCID-BPD, Structured Clinical Interview for Borderline Personality Disorder: clinical cut-off = 5; MSI-BPD, MacLean Screening Instrument; DERS, Difficulties in Emotion Regulation Scale; BEST, Borderline Evaluation of Severity over Time; MFQ, Moods and Feelings Questionnaire; SCARED, Screen for Child Anxiety-Related Emotional Disorder.  $\chi^2$  = Pearson's chi-square; *F* = one-way ANOVA omnibus statistic.

**Table 2.** Self-harm, A&E, bed days, and education/work status descriptive and inferential statistics

	<i>n</i>	<i>M</i>	<i>Mdn</i>	<i>SD</i>	Range	Statistical test	<i>r</i>
<b>% Self-harm-free weeks</b>	138						
Pre-treatment		65%	67%	33%	0–100%		
Quarter 1		72%	80%	29%	0–100%		
Quarter 2		79%	89%	24%	0–100%		
Quarter 3		85%	93%	21%	0–100%		
Quarter 4		88%	93%	18%	0–100%	$\chi^2 = 105.85^{**}$	
<b>Count of self-harm incidents</b>	140						
First 8 weeks		7.31	4.00	12.78	0–108		
Final 8 weeks		1.59	0.00	3.29	0–29	$Z = -7.58^{**}$	<b>-.64</b>
<b>Count of occupied bed days</b>	152						
Before treatment		43.75	1.00	73.76	0–365		
During treatment		2.63	0.00	7.37	0–44	$Z = -7.30^{**}$	<b>-.59</b>
<b>Count of A&amp;E attendances</b>	150						
Before treatment		1.61	1.00	1.78	0–10		
During treatment		0.65	0.00	1.30	0–8	$Z = -5.87^{**}$	<b>-.48</b>
<b>Work and education status</b>							
Assessment: in work/education	124 (80%)						
End treatment: in work/education	137 (89%)					$\chi^2 = 13.64^{**}$	

\*\*Significance level <.01, two-tailed. *r* = Rosenthal’s effect size,  $\chi^2$  for % self-harm-free weeks = Friedman’s two-way analysis of variance omnibus test; *Z* = Wilcoxon signed rank test;  $\chi^2$  for work and education status = McNemar’s change test.

**Table 3.** Outcome (change scores) Pearson’s correlations

	Tx length	Age
MSI-BPD	-.06	.07
BEST		
Thoughts & Feelings	.06	.01
Behavioural Symptoms	-.02	.13
Positive Behaviours	-.13	.01
Total	.07	.04
DERS		
Non-acceptance	.06	-.10
Goals	<b>.27**</b>	-.02
Impulse	.17	-.02
Awareness	.01	-.13
Strategies	.14	.01
Clarity	.08	.14
Total	.18	-.04
MFQ	.07	.05
SCARED	-.05	.11
% Self-harm-free weeks <sup>a</sup>	-.16	.11
Count of self-harm <sup>a</sup>	<b>.23**</b>	-.04
Occupied in-patient bed days <sup>a</sup>	.09	-.06
A&E attendances <sup>a</sup>	.03	<b>-.17*</b>

\*Significance level <.05, two-tailed.

\*\*Significance level <.01, two-tailed.

<sup>a</sup>Spearman’s rho correlations due to not meeting the assumptions of the Pearson’s correlation.

Change scores: T1 – T2. MSI-BPD, MacLean Screening Instrument; DERS, Difficulties in Emotion Regulation Scale; BEST, Borderline Evaluation of Severity Over Time; MFQ, Moods and Feelings Questionnaire; SCARED, Screen for Child Anxiety-Related Emotional Disorder; % Self-harm-free weeks: pre-treatment – quarter 4. Count of self-harm: first 8 weeks – last 8 weeks. Occupied bed days and A&E attendances: matched period before treatment – during treatment.

and making informed decisions about how to implement protocols in clinical practice (Kendall and Frank, 2018). There is a need for publication of data comparing outcomes in adapted and non-adapted evidence-based therapies in practice, and where this does exist there is some evidence to suggest established protocols have a degree of robustness for adaptation, and that adaptation does not tend to impact outcomes (Stirman *et al.*, 2017). There are helpful

**Table 4.** Routine outcome measure descriptive and inferential statistics

	<i>n</i>	Assessment		End of treatment		Paired samples <i>t</i> -tests	
		<i>M</i> ( <i>SD</i> )	Range	<i>M</i> ( <i>SD</i> )	Range	<i>t</i>	<i>d</i>
MSI-BPD	116	8.32 (1.72)	1–10	5.63 (3.01)	0–10	<b>10.01**</b>	<b>0.93</b>
BEST							
Thoughts & Feelings	105	29.08 (5.66)	11–40	22.43 (7.32)	8–39	<b>9.17**</b>	<b>0.90</b>
Behavioural Symptoms	105	11.85 (3.47)	4–20	7.92 (3.49)	4–19	<b>10.90**</b>	<b>1.06</b>
Positive Behaviours	105	7.91 (2.66)	3–15	9.84 (2.84)	3–15	<b>-5.44**</b>	<b>-0.53</b>
Total	105	48.01 (9.35)	21–68	35.51 (11.52)	15–68	<b>10.68**</b>	<b>1.04</b>
DERS							
Non-acceptance	105	21.38 (5.93)	7–30	16.95 (6.17)	6–30	<b>7.23**</b>	<b>0.71</b>
Goals	105	21.51 (3.43)	8–25	18.04 (4.44)	9–25	<b>7.63**</b>	<b>0.75</b>
Impulse	105	21.98 (5.37)	8–30	15.74 (5.97)	6–30	<b>9.23**</b>	<b>0.90</b>
Awareness	105	21.17 (4.23)	11–30	18.17 (4.84)	6–28	<b>5.75**</b>	<b>0.56</b>
Strategies	105	31.54 (6.08)	11–40	23.44 (7.73)	10–40	<b>9.83**</b>	<b>0.96</b>
Clarity	105	17.10 (4.05)	8–24	13.78 (4.25)	6–25	<b>7.65**</b>	<b>0.75</b>
Total	106	134.48 (20.15)	61–177	106.14 (27.17)	45–178	<b>10.32**</b>	<b>1.00</b>
MFQ	109	46.07 (11.67)	3–64	32.42 (16.18)	2–62	<b>9.24**</b>	<b>0.89</b>
SCARED	107	48.78 (14.90)	7–82	39.64 (17.06)	3–71	<b>7.64**</b>	<b>0.74</b>

\*\*Significance level <.01, two-tailed.

MSI-BPD, MacLean Screening Instrument: clinical cut-off =  $\geq 7$ ; DERS, Difficulties in Emotion Regulation Scale: clinical cut-off total score =  $\geq 128$ ; BEST, Borderline Evaluation of Severity Over Time: clinical cut-off total score =  $\geq 42$ ; MFQ, Moods and Feelings Questionnaire: clinical cut-off =  $\geq 29$ ; SCARED, Screen for Child Anxiety-Related Emotional Disorder: clinical cut-off =  $\geq 25$ . *d* = Cohen's *d*.

contributions from certain authors providing possible frameworks to guide decision making around modifications to treatment (Goldstein *et al.*, 2012; Phan and Renshaw, 2021).

One hundred and fifty-five young people started the full DBT treatment programme between April 2015 and April 2021. Of those who started pre-treatment, 85% signed up to the full DBT programme and 75% of those who started DBT, completed. This is within the range of retention observed in other DBT studies (42–88%; Johnstone *et al.*, 2021), and higher than other naturalistic studies of UK NHS-based DBT (42%; Gaglia *et al.*, 2013) and general child and adolescent interventions (50%; de Hann *et al.*, 2013). Previous qualitative investigations in this DBT programme have indicated that engagement has been supported by feeling understood overall and feeling contained during crisis incidents, as well as the development of skills for managing difficult situations (Ratnaweera *et al.*, 2021). The observation that engagement is supported by feeling understood and supported during crises, lends weight to the appropriateness of the conceptual models of emotional dysregulation, the biosocial model, and the need for validation (Linehan, 1993). These principles are shared with individuals during therapy as the main way to understand how their difficulties may have developed and what may maintain them over time.

Those who opted out after starting treatment endorsed higher impulsivity, non-acceptance of emotions, overall emotion dysregulation and maladaptive behaviour associated with BPD symptoms at baseline. These are similar predictors of treatment non-completion in other studies of adult and adolescent populations with BPD symptoms (for review, see Barnicot *et al.*, 2011). This suggests that those who opt out during DBT may have higher symptom severity when entering treatment. Self-reported reasons for opting out of DBT were found in this study to be similar to previous studies, including the high demand on time, practical barriers to accessing the treatment, and finding treatment components, such as skills group, difficult (Dixon and Linardon, 2020). Indeed, early evidence suggests that longer DBT-A programmes may be more susceptible to treatment non-completion for some individuals (Gillespie *et al.*, 2019), but meta-analytic research suggests that longer DBT interventions may also lead to improved outcomes compared with shorter interventions (Kothgassner *et al.*, 2021). This may be an important consideration for balancing meeting the treatment needs of diverse client groups and ensuring acceptability and

accessibility. Suggested treatment adaptations for those individuals with personal or systemic barriers to accessing longer-term interventions may include a more flexible and less time-intensive intervention and adopting aspects of 'outreach' models that reduce barriers to accessing intensive treatments such as standard DBT, especially when symptom severity and risk is high. Additional work in the pre-treatment and engagement periods may be needed to address structural issues including lack of housing, education, occupation or supportive relationships for a young person, as well as supporting the reduction of therapy-interfering behaviours, the development of commitment to change, and to strengthen skills needed to help young people access DBT.

This evaluation reports a methodology for the collection and analysis of self-harm and health-economic-proxy outcomes that may be feasible and applicable for other clinical services to evidence impact, including, for example, comparing costly in-patient admissions prior to and during treatment. The weekly collection of core outcomes via DBT diary cards, which are to be completed by all participants in DBT as standard, can be used as measures of self-harm rates where the application of more rigorous self-report measures may be precluded by setting limitations or patient response rates. However, it was useful to corroborate these with other data sources and in discussion with the wider team during consultation or case management meetings to optimise accuracy of the data. The frequency of suicidal and non-suicidal self-harm incidents collected in this evaluation significantly decreased from the start to the end of treatment, with a large effect size. Moreover, use of emergency services and in-patient bed stays decreased significantly from the matched period before to during treatment with a medium to large effect. Previous RCTs and uncontrolled studies have found similar reductions in self-harm and emergency service use from the start to the end of DBT (Bahji *et al.*, 2021; MacPherson *et al.*, 2012), with important cost implications for services (Tsiachristas *et al.*, 2017). However, there was not enough reliable data to include a comparison of self-harm rates for the matched period before treatment, compared with during treatment, which would further support with understanding the effectiveness of DBT for this outcome.

Young people up to the age of 18 years are required by UK law to be offered a place in education or employment, and there are statutory responsibilities on local authorities and schools to support this provision (Department for Education, 2016). It was therefore seen as important for commissioning to measure work and education status in this service as a proxy for everyday functioning. This evaluation found that the proportion of those engaged in work or education increased by the end of treatment. An increase in engagement with work or education is an important functional outcome which is largely omitted in RCT-led research studies. DBT aims to support young people to build a life worth living, which often includes goals around career aspiration, building healthy relationships, and developing financial stability. Research suggests that increased meaningful activities has a positive impact on mental health outcomes (Caldwell, 2005). The examination of patient-centred outcomes represents an important avenue for services and future research (e.g. Ashworth *et al.*, 2009).

Self-report routine outcome measures (emotion dysregulation, emerging BPD, depression and anxiety symptoms) were implemented in service delivery in order to measure changes in typical symptoms reported in populations who are likely to need DBT and for comparison with the evidence-base. It is noted that measures were selected on the basis of a scoping review, at the time of implementation, of freely available resources. There were fewer validated self-report measures for emotional dysregulation and BPD symptoms within adolescent samples at the time. Therefore, while the included measures represent applicable clinical tools to evaluate outcomes, future clinical research might helpfully focus on standardising measures to be used for clinical applications of standardised and adapted DBT-A (Beidas *et al.*, 2015). On average, participants had statistically significant reductions in emotion dysregulation, emerging BPD symptoms, depression and anxiety by the end of treatment, with small to large effect sizes. BPD symptoms and emotion dysregulation on average decreased to below clinical cut-off by the end of treatment. This is an important finding as emotion dysregulation scores in this service at assessment were higher than norms for psychiatric populations (Gratz and Roemer, 2004; Neumann *et al.*, 2010),

and emotion dysregulation is suggested to be core to emerging BPD symptomatology, and therefore is a key treatment target within DBT (Linehan, 1993; Miller *et al.*, 2006). Furthermore, the use of the DERS Strategies subscale and BEST Positive Behaviours subscale gives an insight into the increase in adaptive emotion regulation strategies and behaviours by the end of DBT, which is important as the development and generalisation of adaptive skills is also a core aim of DBT and thought to mediate outcomes (Linehan *et al.*, 2015).

Despite significant reductions in self-reported anxiety and depression scores, these remained above clinical cut-off at the end of DBT. In this specific Tier 4 service context, scores of depression and anxiety at assessment were considerably higher compared with norms even from other out-patient clinical populations (Birmaher *et al.*, 1999; Daviss *et al.*, 2006), reflecting the severity of mental health difficulties in this sample. Outstanding difficulties with depression and anxiety at the end of treatment may reflect the increased stress associated with ending a longer-term therapy and therapeutic relationship, alongside transitioning to new services (Vyas *et al.*, 2015). The service would be considered as 'Stage 1' DBT, which largely aims to stop all life-threatening behaviours and significantly reduce therapy-interfering and severe quality-of-life-interfering behaviours in order to support young people to access lower tiered, 'Stage 2' services/interventions (Linehan, 1993). Therefore, it may not be expected that more typical 'Stage 2' targets show significant change in 'Stage 1' DBT. A total of 75% of young people were 'stepped-down' at the end of treatment for further support within local CAMHS which might constitute 'Stage 2' of DBT, focusing more on quality-of-life-interfering difficulties.

Finally, whilst available diagnostic frameworks for BPD in adults were used in the service (e.g. SCID-BPD) alongside BPD outcome measures (e.g. MSI-BPD, BEST), in line with clinical guidelines, young people were not automatically diagnosed with BPD if they met criteria (National Collaboration Centre for Mental Health, 2009; Swales, 2022). Instead, a discussion was had with young people and their families about the diagnosis, its strengths and limitations, differential diagnoses such as complex post-traumatic stress disorder, and the potential stigma associated with BPD (Klein *et al.*, 2022; Lamb *et al.*, 2018; Swales, 2022). The use of diagnostic terminology was guided by what was identified as clinically helpful in collaboration with the young person. It was highlighted that a diagnosis of BPD was not necessary to access this DBT programme and improvements in symptoms may mean that the diagnostic framework ceased to be a useful reference by the end of treatment. Self-reported reductions in BPD symptomatology in the current evaluation nonetheless implies that early intervention using DBT may help to reduce the significant impact of BPD-related difficulties and potentially prevent future mental ill-health and demand on adult mental health services (Chanen *et al.*, 2017; Miller *et al.*, 2008).

### **Strengths and limitations**

This study is one of the few known studies to present data on the implementation and outcome collection of a CAMHS DBT programme for young people within a naturalistic UK NHS setting. However, due to the use of routine-collected clinical data in this study, there were no controls for potentially confounding variables and no control group to determine whether changes in outcomes were attributable to the DBT intervention. Therefore, conclusions cannot be made regarding effectiveness. The modest statistical analysis may also impact inferences, thus future studies may consider more complex analyses (e.g. linear mixed effects models). There were additional limitations in the methods of data collection. For example, it is possible that the pre-DBT A&E attendance and occupied bed day estimates are an under-representation due to lack of reliable data before DBT. Moreover, the dependence on self-report measures for clinical outcomes meant that the evaluation was open to subjective bias in reporting. This may be particularly influenced by the varied methods of assistance provided to participants when completing routine outcome measures, but this was informed by clinical need. There may also have been data reliability issues in information gathered from NHS records. While self-harm incidents were

corroborated with other data sources to improve data reliability, no formal process or tool was in place to ensure inter-rated reliability. Furthermore, suicidal and non-suicidal self-harm were grouped together due to difficulties making clear distinctions between the nature of, and often multiple motivations behind, these behaviours, similar to previous studies (e.g. Hawton *et al.*, 2002; Ougrin *et al.*, 2015). Other studies have included proxies of suicidality such as suicidal ideation (e.g. Mehlum *et al.*, 2014), and this service later implemented the Reasons for Living Inventory (adolescent version; Osman *et al.*, 1998), in order to monitor this outcome, which may be a useful addition to DBT services and future studies.

While the majority of questionnaires were validated in adolescent populations, the BEST was not validated in people below the age of 16 years and thus outcomes from this measure should be treated with caution. However, the BEST was included due to its sensitivity to change in BPD symptoms severity over time and its inclusivity of adaptive behaviours, as well as being a freely available resource identified in previous reviews (Beidas *et al.*, 2015). The DBT team were all formally trained in DBT, attended regular consultation team meetings, and received external expert supervision to support treatment adherence and quality. However, the team did not have structured evaluation methods to assess treatment adherence in this evaluation because these were not freely available at the service outset. New freely available tools for measuring adherence have been developed and the use of treatment adherence checklists in future services and evaluations would provide quality and fidelity assurances (Harned *et al.*, 2021). Finally, those who opted out during treatment often did not complete end-treatment measures, thus only a limited number were presented in the ITT analysis for secondary outcomes. Future services and evaluations might seek to improve processes for collecting data when young people opt out before completion, including via exit interviews; incorporating corroborative measures of clinical outcomes from clinicians, parents/carers, or education representatives; include broader functional outcomes; and follow-up of young people after treatment ends to provide useful insight into the sustainability of outcomes, albeit this is not usually possible within core service delivery.

## Conclusion

This study provides an insight into the implementation and clinical outcomes of a CAMHS DBT service delivered within a UK NHS setting. The collection of, and reductions in, emergency and in-patient service use, self-harm, emotion dysregulation, emerging BPD symptomatology, depression and anxiety by the end of DBT may be a useful model for future services needing to monitor outcomes. Reporting on the delivery of DBT for adolescents within naturalistic public health service contexts, alongside controlled trials, is an important part of evaluating the feasibility of therapies for complex mental health needs in these settings.

### Key practice points

- (1) Collection of clinical outcomes using the DBT diary card, corroborated with records and in-session reports, alongside self-report measures of symptomatology and broad functional outcomes may be useful methods for outcome collection and monitoring in CAMHS DBT services.
- (2) CAMHS DBT services may need to adapt treatment modes to meet the needs of local populations and consider how clients can access proxies of therapy modes to ensure the intervention continues to achieve the desired functions.
- (3) Attempts to reduce key barriers cited as reasons for not signing up to DBT, or opting out before completion, may be useful to improve accessibility for those who are assessed as suitable for DBT, including access to the clinic and conflict between other life commitments.
- (4) A reduction in self-harm, in-patient bed days, A&E attendances, BPD symptoms, emotion dysregulation, and depression and anxiety symptoms, alongside an increase in skill use, 'positive' behaviours, and those engaged in work/education was observed by the end of this CAMHS DBT programme.

## Further reading

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**Miller, A. L., Rathus, J. H., & Linehan, M. M.** (2006). *Dialectical Behavior Therapy with Suicidal Adolescents*. New York: Guilford Press.

**Rathus, J., & Miller, A.** (2015). *DBT Skills Manual for Adolescents*. New York: Guilford Press.

**Swales, M.** (ed) (2019). *Oxford Handbook of Dialectical Behaviour Therapy*. Oxford: Oxford University Press.

**Supplementary material.** The supplementary material for this article can be found at <https://doi.org/10.1017/S1754470X23000211>

**Data availability statement.** The data are not publicly available as they constitute data collected as part of routine clinical delivery and thus are sensitive.

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