

Mindfulness as taught in Dialectical Behaviour Therapy: A scoping review

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Abstract

This scoping review considers 11 studies that have focussed on the effect of teaching the mindfulness element of Dialectical Behaviour Therapy (DBT) on clinical outcomes. These articles utilized either mindfulness skills as embedded into the full DBT-Skills programme or a stand-alone mindfulness skills module (DBT-M), as treatment for clinical populations. The review of the research found that clinical application of mindfulness as taught in DBT leads to increases in self-reported mindfulness—especially non-judgemental awareness along with psychological measures that suggests an increase in mindfulness, for example, improved attention. The studies demonstrated that an increase in mindfulness had a positive effect on some clinical symptoms such as symptoms of Borderline Personality Disorder. Not all of the studies controlled for the effect of group, amount of practice or other elements of DBT therapy. The findings suggest that more needs to be done to establish the underlying mechanisms of change when being taught mindfulness in DBT.

KEYWORDS

Borderline Personality Disorder, Dialectical Behaviour Therapy, mindfulness

1 | INTRODUCTION

The use of mindfulness meditation as a treatment for mental health problems has been of interest to clinicians and researchers since it was brought to the fore by Kabat-Zinn (1990) in his work on Mindfulness Based Stress Reduction (MBSR). Variations of mindfulness practice are used in different therapeutics approaches including Mindfulness Based Cognitive Therapy (MBCT), Acceptance and Commitment Therapy (ACT) and Dialectical Behaviour Therapy (DBT) (Baer & Krietemeyer, 2006). The use of mindfulness in the intervention is somewhat different depending on the therapeutic modality and the intended benefit of including mindfulness in the therapy. For example, ACT has a focus on thought diffusion, whereas DBT has a focus on acceptance of emotional states (Bass et al., 2014). Stanley (2013) proposed that mindfulness-based interventions for mental

health are secularized forms of meditation that bring symptomatic relief through changing the way in which people think about their lives. The emphasis of the eastern philosophy of ‘non-judgementally paying attention, on purpose’ (Kabat-Zinn, 1990) has shifted in western adaptations towards an emphasis of drawing attention to the present moment through noticing what is distinctive about this present moment (Langer & Moldoveanu, 2000).

DBT was developed specifically to treat Borderline Personality Disorder (BPD) as defined by DSM IV (American Psychiatric Association, 2013). DBT incorporates mindfulness as a key component of change, with an emphasis on awareness and acceptance (Stanton & Dunkley, 2019). Mindfulness in DBT is taught as a set of skills (Linehan, 2015). By using the ‘What’ skills of Observe, Describe and Participate, the individual is invited to be aware of their experiences. By using the ‘How’ skills of non-judgementally, one-mindfully

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and effectively the individual learns to change their responses to their experiences. These skills are used to enhance the ability of the individual to notice their state of mind and to use their 'wise mind' to guide their actions. Chiesa and Malinowski (2011) highlighted that DBT focusses on walking a middle path between acceptance and change whereas the two more widely recognized MBIs (MBCT and MBSR) have a greater emphasis on insight into symptoms through directed mindful meditation. ACT also has a somewhat different focus in mindfulness practice encouraging diffusion from thoughts—acknowledging thoughts as transitory, perceptions of our world and engaging in a non-evaluative experience of the here and now (Hayes & Wilson, 2003). Such differences pose a challenge to any comparison of MBIs and can shed doubt on whether mindfulness as taught in DBT has been established as effective in improving clinical outcomes.

There are several theory and research driven mechanisms of change that are thought to contribute to change in the therapeutic use of mindfulness in Mindfulness Based Interventions (MBIs). Essentially mindfulness has been incorporated into different therapeutic approaches to change a person's relationship to their experiences rather than the content of their experiences (Baer & Krietemeyer, 2006). As there are a variety of approaches taken in MBI, the proposed mechanisms of change are similarly diverse as demonstrated by a wide literature with regard to mechanisms of change including structural brain changes, reduced autonomic arousal, perceptual shifts, increase in spirituality, greater situational awareness, values classification, increase in self-awareness, addiction substitution, urge surfing and letting go (Shonin & Van Gordon, 2016). With a particular focus on mindfulness for individuals with BPD—the target population for DBT—Lynch et al. (2006) hypothesized that mindfulness was useful because it provides a context for exposure to and extinction of previously problematic emotional responses, improves emotional regulation by changing automatic responses to emotions and changes the person's relationship to their thoughts as just thoughts rather than truths and increases the individual's ability to turn their attention to where they choose. Mechanism of change at an individual level is likely to be different depending on the approach, the clinical symptoms being targeted and the personal history of the service user and the approach of the practitioner (Shonin & Van Gordon, 2016). Therefore, developing an all-encompassing theory of how mindfulness works to reduce clinical symptoms is extremely complex as there are numerous variables that could contribute to observed changes.

In reviewing literature that specifically focussed on MBIs, some systematic reviews (Chiesa & Serretti, 2010; Mars & Abbey, 2010) and meta-analyses (Hofmann et al., 2010) of mindfulness interventions deliberately excluded mindfulness as taught in DBT. A key finding from this literature was that it was not possible to fully clarify the effect of mindfulness in DBT, as mindfulness in DBT is taught as part of a wider treatment programme rather than as the main treatment. Therefore, the aim of this review was to scope the literature for studies that had included mindfulness as part of DBT in clinical populations. A scoping review was adopted to chart and summarize results

Key practitioner message

- Mindfulness in DBT has been researched as embedded within skills training and as a stand-alone Module (DBT-M).
- Studies show an increase in facets of mindfulness when patients undertake DBT-Skills or DBT-Mindfulness with facets of Acting with Awareness and Non-judgement increasing mostly frequently.
- Studies show a positive effect of increased mindfulness on some clinical indicators.

of studies of mindfulness used in DBT as the studies available were too diverse to draw conclusions as to the effectiveness of mindfulness in DBT in a systematic review (Pham et al., 2014).

Thus, the question guiding this review was: Has mindfulness in DBT been studied empirically with clinical populations, and if so, what were their findings?

The aims of this scoping review were to establish:

1. the approaches that have been taken to empirically study mindfulness in DBT;
2. whether studies found levels of mindfulness changed after mindfulness training in DBT;
3. whether studies found that clinical outcomes changed after mindfulness in DBT;
4. whether studies were able to establish a relationship between changes in mindfulness and improved clinical outcomes.

2 | METHOD

The search was completed in Spring 2020. The EBSCO platform was used to access the following Databases: CINAHL, MEDLINE, Psychinfo and Psych Articles. The search used the terms 'mindfulness' AND 'DBT' OR 'Dialectical Behaviour Therapy' OR 'Dialectical Behaviour Therapy' in the title. The search was limited to empirical research articles only. Duplicates were removed, and additional studies were identified through examination of lists. The resulting papers were screened to identify studies published in English which focussed on populations receiving DBT as a clinical treatment. The remaining papers were assessed by the principal author for eligibility based on the criteria in Table 1, and two were removed as they were not empirical.

3 | FINDINGS

Studies were identified by a systematic search using PRISMA guidelines as outlined in Figure 1.

The papers were reviewed and summarized, and the findings were organized with regard to the aims of the review. A synthesis was developed across the papers with the following themes: intervention applied, research design, findings relating to facets mindfulness, findings relating to clinical outcomes and findings relating to the association between facets of mindfulness on clinical outcomes.

TABLE 1 Inclusion and exclusion criteria for papers identified for the scoping review

Inclusion	Exclusion
The study has: 1. Generated empirical evidence 2. Focussed on the effects of mindfulness as taught in DBT on a. The measurement of mindfulness in the sample And/or b. The measurement of clinical outcomes, i.e., depression 3. Has used the intervention in vitro with a clinical population i.e., open to a mental health service	The study has: 1. Not used an empirical methodology 2. Was published in a language other than English

4 | RESULTS

4.1 | Approaches taken to the empirical study of mindfulness in DBT

The systematic search produced 11 papers for review. Of note, 6 of the 11 studies were conducted by the same research group based in Spain with different types of results being reported from similar cohorts. Table 2 summarizes the sample, intervention applied, design, strengths, limitations and findings of the 11 studies that were included in the review.

4.2 | Comparison and quality of studies

As outlined in Table 2, the studies focussed on mindfulness as delivered by a range of approaches. The manualized version of DBT uses a combination of therapeutic modalities including group-based skills training, individual therapy, telephone coaching and consultation to the therapist (Linehan, 1993). Not all DBT programmes offer the manualized version of DBT, and many have made adaptations to fit with

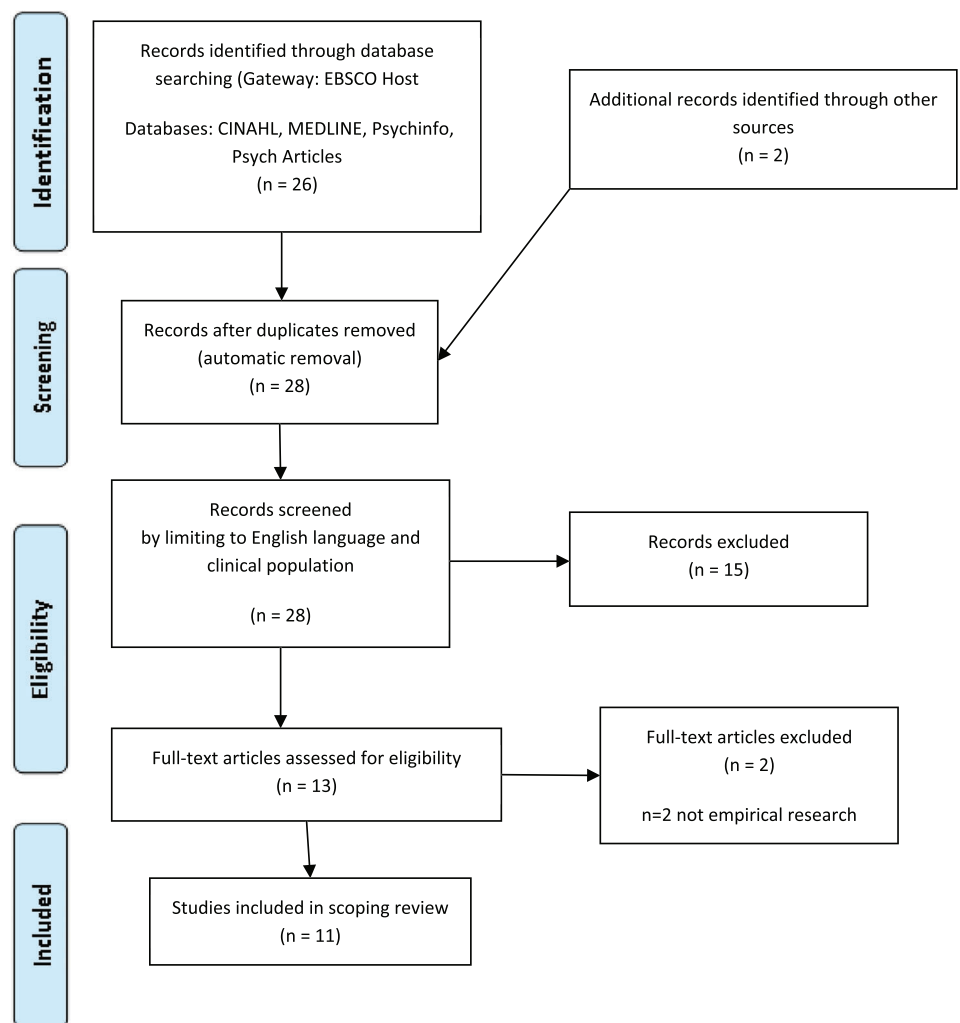


FIGURE 1 Database search for literature using search terms mindfulness (in title) and DBT/dialectical behaviour therapy (in title)

TABLE 2 Summary of studies included in the review

Author/date	Overview	Design and strengths/limitations	Results: Facets of mindfulness with significance	Results: Clinical outcomes with significance
Perroud et al. (2012)	<p>Sample: 54 individuals with BPD from an outpatient clinic</p> <p>Demographics: Switzerland; adults mean age 30.5; 47 female/7 male; no ethnicity data</p> <p>Intervention: 4-week intensive DBT followed by standard DBT including individual work.</p>	<p>1-year follow-up study. Pre-post measures of mindfulness and clinical symptoms.</p> <p>Strengths: Data collected over 1 year</p> <p>Limitations: No control group so unable to account for direction of change between mindfulness facets and clinical symptoms. Unable to account for effect of being in a group intervention. Unable to account for specific teaching of mindfulness as taught: all DBT skills</p>	<p>Increase from KIMS: Accepting without judgement ($p < 0.0001$)</p>	<p>Decrease from BDI: Depression ($p < 0.0001$);</p> <p>Decrease from BHS: Hopelessness ($p < 0.0001$)</p>
Soler et al. (2012)	<p>Sample: 59 individuals with BPD from outpatient clinic</p> <p>Demographics: Spain; adults 18–48; 51 female/8 male; no ethnicity data</p> <p>Intervention: 8-week DBT-M</p>	<p>Non-randomized control trial GPM + DBT-M vs. GPM only. Measures of mindfulness, clinical symptoms and laboratory measure of attention.</p> <p>Strengths: Mindfulness specific module used to isolate mindfulness from other DBT skills</p> <p>Limitations: Control group GPM only so unable to account for the effect of being in a structured group intervention</p>	<p>Results for FFMQ not shared in the paper. However, the FFMQ subscale of non-reactivity to inner experience was found to correlate to the amount of practice undertaken ($p = 0.008$).</p>	<p>Decreases from HDRS: Related to the amount of practice: Depression ($p < 0.001$); decrease from BPRS: Psychiatric symptoms ($p = 0.001$); Decrease from PMS: Confusion ($p < 0.001$);</p> <p>Decrease from PMS: Total mood distortion ($p = 0.03$)</p>
Feliu-Soler et al. (2014)	<p>Sample: 35 individuals with BPD from outpatient clinic</p> <p>Demographics: Spain; adults 18–45; 31 female/4 male; no ethnicity data</p> <p>Intervention: 10-week DBT-M</p>	<p>Non-randomized control trial of DBT-M vs. GPM. Measures of mindfulness, clinical symptoms and laboratory measure salivary cortisol.</p> <p>Strengths: Mindfulness specific module used to isolate mindfulness from other DBT skills</p> <p>Use of objective measurement</p> <p>Limitations: Control group GPM only so unable to account for the effect of being in a structured group intervention</p> <p>Small sample size limits hypothesis testing</p>	<p>From EQ: Non-significant results</p>	<p>Decrease from HDRS: Depression ($p = 0.002$);</p> <p>Decrease from BPRS: Psychiatric symptoms ($p = 0.001$)</p> <p>No differences in biological variables (salivary cortisol).</p>
Elices et al. (2016)	<p>Sample: 64 individuals with BPD from outpatient clinic</p> <p>Demographics: Spain, adults 18–45; 56 female/8 male; all Caucasian</p> <p>Intervention: 10-week group therapy of either DBT-M or DBT IE in outpatient setting.</p>	<p>Single Centre randomized trial DBT-M vs. DBT IE. Measures of mindfulness, clinical symptoms.</p> <p>Strengths: Randomized between DBT modules to compare effect of content of module.</p> <p>Limitations: Small sample size and drop out reduced power of results</p>	<p>Decrease from BIS-11: Impulsivity ($p < 0.001$)</p>	<p>Decrease form BSL-23: Total score ($p = 0.001$)</p>
Soler et al. (2016)	<p>Sample: 64 individuals with BPD from outpatient clinic (44 to completion of intervention)</p>	<p>Single Centre randomized trial DBT-M vs. DBT IE. Measures of mindfulness, clinical symptoms and laboratory measure of impulsivity.</p>	<p>Increase from FFMQ: Non-judgement ($p = 0.03$);</p> <p>Increase from FFMQ: Describing ($p = 0.03$);</p>	<p>Non-significant results from continuous performance test-I; GoStop impulsivity paradigm; two choice impulsivity paradigm; single key</p>

TABLE 2 (Continued)

Author/date	Overview	Design and strengths/limitations	Results: Facets of mindfulness with significance	Results: Clinical outcomes with significance
Krantz et al. (2018)	<p>Demographics: Spain; adults 18–45; 41 female/3 male; no ethnicity data</p> <p>Intervention: 10-week group therapy of either DBT-M or DBT-IE in outpatient setting</p>	<p>Strengths: Randomized between DBT modules to compare effect of content of modules</p> <p>Limitations: Unable to account for other impulsivity related disorder as no diagnostic test of ADHD, etc.</p> <p>Unable to account for the effect of continued prescribed medication</p>	Increase from EQ: Decentring ($p = 0.001$)	impulsivity paradigm; time paradigm test
Carmona I Farres, Elices, Soler, Dominguez-Clavé, Martín-Banco, et al. (2019)	<p>Sample: 84 individuals with BPD from outpatient clinic</p> <p>Demographics: Canada; adults 18–60; 66 female/18 male; no ethnicity data</p> <p>Intervention: 20-week DBT skills training (DBT-S) programme in outpatient setting</p>	<p>Randomized control trial DBT-S vs. TAU. Measures of mindfulness, clinical symptoms.</p> <p>Strengths: Use of non-suicidal self-injury as a measure of clinical impact</p> <p>Limitations: Control group TAU only so unable to account for the effect of being in a structured group intervention</p> <p>Non-standardized treatment—shorter than standard programme</p>	Increase from KIMS: Accepting without judgement ($p = 0.03$)	Decrease from modified L-SASII: Non-suicidal self-injury ($p = 0.04$)
Carmona I Farres, Elices, Soler, Dominguez-Clavé, Martín-Banco, et al. (2019)	<p>Sample: 65 individuals with BPD from outpatient clinic</p> <p>Demographics: Spain; adults 18–50; 58 female/7 male; no ethnicity data</p> <p>Intervention: 10-week group therapy of either DBT-M or DBT-IE in outpatient setting</p>	<p>Single centre randomized - DBT-M vs. DBT-IE. Measures of mindfulness, clinical symptoms and fMRI of default mode network.</p> <p>Strengths: Randomized between DBT modules to compare effect of content of modules</p> <p>Use of objective measurement</p> <p>Limitations: No healthy control for fMRI</p> <p>DBT-M module included 3 sessions from distress tolerance therefore not comparable to other DBT-M studies</p>	<p>Increase from FFMQ: Non-reactivity ($p = 0.015$)</p> <p>Increase from FFMQ: Non-judging ($p = 0.039$)</p> <p>Increase from FFMQ: Total score ($p = 0.023$)</p>	Improvements in clinical outcomes were non-significant against outcomes for DBT-IE. Changes were considered to be due to different mechanisms of change depending on module. Hypothesis of DMN deactivation disproved
Carmona I Farres, Elices, Soler, Dominguez-Clavé, Pomarol-Clotet, et al. (2019)	<p>Sample: 70 individuals with BPD from outpatient clinic</p> <p>Demographics: Spain; adults 18–50; 63 female/7 male; no ethnicity data</p> <p>Intervention: 10-week group therapy of either DBT-M or DBT-IE in outpatient setting</p>	<p>Design: Single centre randomized DBT-M vs DBT-IE. Measures of mindfulness, clinical symptoms and laboratory measure of emotional regulation.</p> <p>Strengths: Randomized between DBT modules to compare effect of content of modules</p> <p>Use of objective measurement</p> <p>Limitations: Assessment of BPD not standardized so BPD symptoms may not have been equal across groups</p>	<p>Increase from FFMQ: Non-judging ($p = 0.001$)</p> <p>Increase from FFMQ: Non-reactivity ($p = 0.003$)</p> <p>Increase from EQ: Decentring ($p = 0.03$)</p>	<p>Decrease from BIS: Impulsivity ($p = 0.03$)</p> <p>Emotional Stroop task: Improvements in emotional regulation were non-significant against outcomes for DBT-IE.</p>

(Continues)

TABLE 2 (Continued)

Author/date	Overview	Design and strengths/limitations	Results: Facets of mindfulness with significance	Results: Clinical outcomes with significance
Mitchell et al. (2018)	<p>Sample: 35 individuals with BPD</p> <p>Demographics: Australia, adults, 33 female/2 male, no ethnicity data</p> <p>Intervention: 20-week DBT skills training programme in outpatient setting</p>	<p>Correlation study pre-post treatment. Measures of mindfulness, clinical symptoms and healthcare usage.</p> <p>Strengths: Sample representative of real-world setting</p> <p>Limitations: No control group so unable to account for direction of change between mindfulness facets and clinical symptoms. Unable to account for effect of being in a group intervention. Unable to account for specific teaching of mindfulness as taught all DBT skills</p>	<p>Increase from FFMQ: Total FFMQ score ($p < 0.0001$);</p> <p>Increase from FFMQ: Observing ($p = 0.027$);</p> <p>Increase from FFMQ: Acting with awareness ($p < 0.001$);</p> <p>Increase from FFMQ: Non-judging ($p < 0.001$);</p> <p>Increase from FFMQ: Non-reactivity ($p < 0.001$)</p>	<p>Decrease across BSL-23; BASIS-32; K10; IDS: Across measures ($p < 0.001$)</p>
Mochrie et al. (2019)	<p>Sample: 212 individuals with acute mental illness using a partial hospital programme</p> <p>Demographics: America, adults 18–66, 140 female/69 male/3 not reported; 185 Caucasian/17 African American/5 Hispanic/4 Asian/1 unreported</p> <p>Intervention: DBT-informed partial hospital programme of varying length for each individual</p>	<p>Pre-post intervention data collection. Measures of mindfulness, clinical symptoms and length of stay</p> <p>Strengths: Larger number of participants</p> <p>Limitations: No control group so unable to account for direction of change between mindfulness facets and clinical symptoms. Unable to account for effect of being in a group intervention. Unable to account for specific teaching of mindfulness as taught all DBT skills</p> <p>Very specific application of DBT in a non-standard DBT programme.</p>	<p>Increase from FFMQ: Observing, describing,</p> <p>Increase from FFMQ: Acting with awareness,</p> <p>Increase from FFMQ: Non-judging and non-reactivity (all $p < 0.0001$)</p>	<p>Decrease from CUDOS: Depression ($p < 0.001$);</p> <p>Decrease from CUAOS: Anxiety ($p < 0.001$);</p> <p>Decrease from BHS: Hopelessness ($p < 0.001$)</p> <p>Decrease from BHS: Suffering ($p < 0.001$);</p>
Zeifman et al. (2020)	<p>Sample: 84 individuals with BPD recruited from outpatient setting</p> <p>Demographics: Canada; adults mean age 29.67; 66 female/18 male; no ethnicity data</p> <p>Intervention: 20-week skills training programme in an outpatient setting</p>	<p>Randomized control trial DBT-skills (DBT-S) vs active wait list (TAU). Measures of mindfulness, clinical symptoms</p> <p>Strengths: Focussed on differences between mindfulness and distress tolerance</p> <p>Limitations: Control group TAU only so unable to account for the effect of being in a structured group intervention</p> <p>Unable to account for specific teaching of mindfulness as taught all DBT skills</p>	<p>Increase from KIMS: Total KIMS score ($p < 0.0001$)</p>	<p>Decrease from BSL-23: Borderline symptoms ($p < 0.001$);</p> <p>Increase from SAS-SR social adjustment ($p < 0.001$)</p>

Abbreviations: BASIS-32, Behaviour and Symptom Identification scale; BDI, Beck Depression Inventory; BHS, Beck Hopelessness Scale; BIS-11, Barrat Impulsiveness Scale; BPD, Borderline Personality Disorder; BPRS, Brief Psychiatric Rating Scale; BSL-23, Borderline Symptoms List; CUAOS, Clinically Useful Anxiety Outcome Scale; CUDOS, Clinically Useful Depression Scale; DBT-IE, Taught interpersonal effectiveness module only; DBT-M, Taught mindfulness module only; DBT-S, Taught all of the DBT via skills modules; DERS, Difficulties in Emotional Regulation Scale; EQ, Experiences Questionnaire; FFMQ, Five Facet Mindfulness Questionnaire; GPM, General Psychiatric Management; HDRS, Hamilton Depression Rating Scale; IDS, Inventory for Depressive Symptomatology; K10, Kessler Psychological Distress Scale; KIMS, Kentucky Inventory of Mindfulness Skills; Modified L-SASII, Suicide attempt self-injury interview; PMS, profile of mood states; SAS-SR, Social Adjustment Scale–Self-Report; SCL-90-R, Global Severity Index of the Symptom Checklist-90—Revised.

particular services or client groups. Three studies studied mindfulness as embedded into a full DBT skills training programme—DBT-S (Krantz et al., 2018; Mitchell et al., 2018; Zeifman et al., 2020). Participants in these programmes will have been taught the other skills modules: interpersonal effectiveness, emotional regulation and distress tolerance. Therefore, the results of these studies relate to the effect of DBT skills training on mindfulness and not the effect of the mindfulness teaching alone. Six studies focussed on exploring a mindfulness module in isolation—DBT-M in an attempt to isolate the effect of mindfulness as taught in DBT which has the effect of isolating the results from the full programme DBT intervention (Carmona i Farres, Elices, Soler, Domínguez-Clavé, Martín-Banco, et al., 2019; Carmona i Farres, Elices, Soler, Domínguez-Clavé, Pomarol-Clotet, et al., 2019; Elices et al., 2016; Feliu-Soler et al., 2014; Soler et al., 2012; Soler et al., 2016). The remaining two studies departed further from the manualized version of DBT in offering short intensive DBT programmes including all of the skills (Perroud et al., 2012) and a hospital programme offered partially in hospital, partially in the community which included some DBT skills training (Mochrie et al., 2019). This departure from the manualized version of DBT to bespoke programmes makes the results less generalizable.

The results of the studies need to be interpreted with a measure of caution. Each study had a combination of strengths and limitations that impact on the authority of the findings (Table 2). This put the studies into three broad categories: studies that used pre-post data methods without a control group—limiting these findings to a description of what happened as a result of that particular intervention at that time without comparison to other interventions (Mitchell et al., 2018; Mochrie et al., 2019; Perroud et al., 2012); studies that controlled against treatment as usual (TAU) or general psychiatric management (GPM)—so that the authors could not account for the effect of being in a group based intervention (Feliu-Soler et al., 2014; Krantz et al., 2018; Soler et al., 2012; Zeifman et al., 2020); and studies that used participation in the DBT Interpersonal Effectiveness module (DBT-IE) as a control in order to control for the effect of a DBT style group intervention (Carmona i Farres, Elices, Soler, Domínguez-Clavé, Martín-Banco, et al., 2019; Carmona i Farres, Elices, Soler, Domínguez-Clavé, Pomarol-Clotet, et al., 2019; Elices et al., 2016; Soler et al., 2016).

There were several challenges in study design and data collection that were highlighted across studies. Studying mindfulness as a clinical intervention is complex because there are many variables that may affect outcomes. Drop-out during the intervention leading to lost data (Carmona i Farres, Elices, Soler, Domínguez-Clavé, Martín-Banco, et al., 2019; Carmona i Farres, Elices, Soler, Domínguez-Clavé, Pomarol-Clotet, et al., 2019; Elices et al., 2016; Mochrie et al., 2019; Soler et al., 2016); the impact of the continuation of other treatments such as medication (Carmona i Farres, Elices, Soler, Domínguez-Clavé, Martín-Banco, et al., 2019; Feliu-Soler et al., 2014; Krantz et al., 2018; Mochrie et al., 2019); how to standardize the intervention (Elices et al., 2016), frequency and length of practice between sessions (Carmona i Farres, Elices, Soler, Domínguez-Clavé, Pomarol-Clotet, et al., 2019; Elices et al., 2016; Krantz et al., 2018; Soler et al., 2016); a reliance on self-report (Carmona i Farres, Elices, Soler, Domínguez-

Clavé, Pomarol-Clotet, et al., 2019; Elices et al., 2016; Mochrie et al., 2019; Perroud et al., 2012); and lack of follow-up assessment to assess longevity of change (Elices et al., 2016; Mitchell et al., 2018) were all cited as challenges to the generation of robust, generalizable findings.

4.3 | Changes in mindfulness post exposure to mindfulness training in DBT

The studies predominately measured mindfulness through standardized self-report questionnaires. Only Zeifman et al. (2020) analysed data relating to mindfulness as a whole with the other studies analysing data relating to different facets of mindfulness.

The Five Facet Mindfulness Questionnaire (FFMQ) (Baer et al., 2006) was used in six of the studies (Carmona i Farres, Elices, Soler, Domínguez-Clavé, Martín-Banco, et al., 2019; Carmona i Farres, Elices, Soler, Domínguez-Clavé, Pomarol-Clotet, et al., 2019; Elices et al., 2016; Mitchell et al., 2018; Mochrie et al., 2019; Soler et al., 2012). The FFMQ asks about frequency of behaviours that suggest the presence of facets of mindfulness: Observing, Describing, acting with awareness, non-judging and non-reactivity. The Kentucky Inventory of Mindfulness Skills (KIMS) (Baer et al., 2004), which asks about four aspects of mindfulness (Observing, Describing, act with awareness, and accept without judgement), was used in three studies (Carmona i Farres, Elices, Soler, Domínguez-Clavé, Pomarol-Clotet, et al., 2019; Krantz et al., 2018; Perroud et al., 2012). Some proxy measures of mindfulness were used studies with the Experiences Questionnaire (EQ) (Fresco et al., 2007) used to measure self-report of decentering (the ability to see the self as separate from an experience) (Carmona i Farres, Elices, Soler, Domínguez-Clavé, Pomarol-Clotet, et al., 2019; Feliu-Soler et al., 2014) and impulsivity using the Barrat Impulsiveness Scale (BIS-11) (Elices et al., 2016; Soler et al., 2016), a decrease in impulsivity being used as a proxy for non-reactivity.

Measuring mindfulness by self-report may be problematic as results may reflect that the person has learnt the language of mindfulness without a change in their aptitude for mindfulness and may only measure an intent to be mindful (Bergomi et al., 2013; Buchheld et al., 2001; Grossman, 2011). This was highlighted as a limiting factor in some of the studies as the reliance on self-report was substantial (Carmona i Farres, Elices, Soler, Domínguez-Clavé, Pomarol-Clotet, et al., 2019; Elices et al., 2016; Mochrie et al., 2019; Perroud et al., 2012).

The findings of five of the studies found that accepting without judgement or non-judgmental awareness increased significantly over the course of the intervention (Carmona i Fares, Elices, Soler, Domínguez-Clavé, Martín-Banco, et al., 2019; Carmona i Farres, Elices, Soler, Domínguez-Clavé, Pomarol-Clotet, et al., 2019; Elices et al., 2016; Krantz et al., 2018; Perroud et al., 2012). Other facets of mindfulness to be found to increase were describing ($p = 0.03$) (Elices et al., 2016) and non-reactivity ($t[21] = -3.41$; $p = 0.003$); ($p = 0.015$) (Carmona i Farres, Elices, Soler, Domínguez-Clavé, Martín-Banco, et al., 2019; Carmona i Farres, Elices, Soler, Domínguez-Clavé, Pomarol-Clotet, et al., 2019).

The results from Mitchell et al. (2018) found a broader development of mindfulness in study participants, detecting a significant increase in all facets of mindfulness except the facet Describe ($p > 0.05$). Carmona i Farres, Elices, Soler, Domínguez-Clavé, Pomarol-Clotet, et al. (2019) reported mindfulness as a total score for the KIMS rather than as separate facets of mindfulness, detecting a significant increase in mindfulness overall after a DBT-S programme, compared to TAU. Carmona i Farres, Elices, Soler, Domínguez-Clavé, Pomarol-Clotet, et al. (2019) also found an increase in mindfulness across facets (each facet $p < 0.001$). Mochrie et al. (2019) did not select on the bases of BPD diagnosis. As BPD has been associated with deficits in mindfulness (Wupperman et al., 2013), these participants may have been more able than samples of individuals with BPD diagnosis to develop mindfulness.

Soler et al., 2016 detected an increase in decentring ($p = 0.001$) and Elices et al. (2016) detecting a decrease in impulsivity ($p < 0.001$) when comparing participants of DBT-M and of DBT-IE. However, Feliu-soler et al. (2014) found no significant change in decentring. The authors suggested that this may have been because the practice of mindfulness was neither close enough in proximity or of sufficient length/frequency to have had a significant affect (Feliu-soler et al., 2014).

4.4 | Changes in clinical outcomes post exposure to mindfulness in DBT

Across the studies, there was interest in a wide range of clinical symptoms and clinical indicators such as hospital admission as described in Table 2. The use of standardized measures of mental disorder was most commonly used, for example, Borderline Symptoms List (Bohus et al., 2009), although some of the studies focussed on psychometric testing of aptitudes considered to be associated with better clinical presentation, for example, the ability to delay gratification being associated with reduced impulsivity and better behavioural control (Soler et al., 2016). The studies did not offer longitudinal findings so it is not possible to say whether any improvement in clinical symptoms or specific psychometric aptitudes were sustained post intervention.

Clinical symptoms were measured using the Borderline Symptom Checklist (Bohus et al., 2009) in six of the studies (Carmona i Farres, Elices, Soler, Domínguez-Clavé, Martín-Banco, et al., 2019; Carmona i Farres, Elices, Soler, Domínguez-Clavé, Pomarol-Clotet, et al., 2019; Elices et al., 2016; Krantz et al., 2018; Mitchell et al., 2018). The Borderline Symptom Checklist is a 23-point scale that measures the strength of feeling with regard to experiences associated with BPD (Bohus et al., 2009). In addition, a variety self-report measures measuring depression, hopelessness, anxiety and other psychiatric symptoms were used across the studies. Three studies used observable measures of clinical outcomes—frequency of non-suicidal self-injury (Krantz et al., 2018), number of admissions to hospital (Mitchell et al., 2018) and length of hospital stay (Mochrie et al., 2019) to determine effects of mindfulness in DBT on clinical outcomes.

Four studies utilized laboratory tests as a way of measuring psychometrics associated with psychopathology—attention (Soler et al., 2012), impulsivity (Soler et al., 2016), stress (Feliu-Soler et al., 2014) and emotional regulation (Carmona i Farres, Elices, Soler, Domínguez-Clavé, Pomarol-Clotet, et al., 2019). The only significant changes were found for attention (Soler et al., 2012) and impulsivity (Soler et al., 2016). The most complex study used neuroimaging to study the effect of DBT-M on the activation of the default mode network (DMN) which is activated when awake but not engaged in a task (Carmona i Farres, Elices, Soler, Domínguez-Clavé, Martín-Banco, et al., 2019). The study hypothesized that mindfulness training would result in a weakened activation of the DMN; a finding that would have suggested that mindfulness was treating BPD at a neurological level. As one of a few studies using an objective measure of clinical change, the non-significant finding was helpful in extending the understanding of mechanisms of change. However, the authors suggested that the small amount of practice and experience of mindfulness offered during the intervention was not enough to show significant changes in the DMN (Carmona i Farres, Elices, Soler, Domínguez-Clavé, Martín-Banco, et al., 2019) making it difficult to conclude whether quality/quantity of mindfulness practice led to the non-significant finding or that changes in activity in the DMN are not required for clinical changes to occur.

All of the studies found an improvement in mental disorder symptoms post intervention, but not all of these were significant compared to controls intervention (see Table 2). That clinical outcomes improved after exposure to DBT skills training is consistent with previous studies of DBT outcomes (Valentine et al., 2015) but alone does not demonstrate the effect of mindfulness as part of the intervention. Therefore, the studies that applied DBT-M only may better help the understanding of the effect of mindfulness within DBT. Elices et al. (2016) found a reduction of BPD symptoms overall in the DBT-M group which was greater than the effect of the control group which used DBT-IE ($t[31] = 3.92$, $p = 0.0004$). However, Carmona i Farres, Elices, Soler, Domínguez-Clavé, Pomarol-Clotet, et al. (2019) found both DBT-M and DBT-IE led to change in emotional regulation and that DBT-M did not perform significantly better than DBT-IE on these scores. That the DBT-M group showed significant change in decentring compared the DBT-IE group suggested that the clinical changes were due to different mechanisms of change between groups—with no clear understanding of how DBT-IE improved emotional regulation (Carmona i Farres, Elices, Soler, Domínguez-Clavé, Pomarol-Clotet, et al., 2019). Feliu-Soler et al. (2014) found that those receiving DBT-M plus GPM had better clinical outcomes than GPM alone in terms of decreases in depression ($p = 0.002$) and decreases in psychiatric symptoms ($p = 0.001$).

4.5 | Relationship between changes in mindfulness and improved clinical outcomes

The final aim of the scoping review was to review the evidence for the proposition that the improvements in clinical outcomes could be attributed to any increase of mindfulness found in the studies.

Five of the studies found that improved clinical outcomes were associated with increases in mindfulness. Perroud et al. (2012) found that accepting without judgement correlated with improvements in BPD symptoms ($\beta = -0.22$; CI -0.42 to -0.03 ; $p = 0.021$) which was in line with the findings of Krantz et al. (2018) who found that *accepting without judgement*—correlated with reduced non-suicidal self-injury ($\beta = -0.10$, $z = -3.50$, $p < 0.001$). Mitchell et al. (2018) found that Non-judging was associated with fewer hospital admissions (95% CI 0.820 – 0.962 ; $p = 0.004$) and that Acting with awareness and Non-judging subscales were associated with significant reductions in BPD symptoms (Acting with Awareness 95% CI, -2.55 to -0.48 ; $p = 0.005$; Non-judging 95% CI, -1.99 to -0.033 ; $p = 0.01$). Additionally, post intervention depression scores could be predicted by change in mindfulness (Mitchell et al. (2018). Furthermore, Mochrie et al. (2019) found that Non-judgement was a predictor of reduced depression ($\beta = -0.76$, $t[201] = -2.90$; 95% CI -1.28 to -0.24 ; $p = 0.004$) and Non-reactivity was a predictor of reduced anxiety ($\beta = -1.12$, $t[201] = -3.11$, 95% CI -1.83 to -0.41 ; $p = 0.002$). Zeifman et al. (2020) demonstrated that improvements in mindfulness overall had a positive effect on clinical outcomes relating to Borderline symptoms and social adjustment. Of these five studies showing increased mindfulness improved clinical outcomes, three were cohort studies and were not controlled (Mitchell et al., 2018; Mochrie et al., 2019; Perroud et al., 2012), and Carmona i Farres, Elices, Soler, Domínguez-Clavé, Pomarol-Clotet, et al.'s (2019) results suggest that mindfulness was not important in the clinical changes as participants in both DBT-M and DBT-Interpersonal Effectiveness achieved comparable improvements in clinical improvements. The commonalities between the group—structured clinical intervention—may have been more important in the clinical changes than the content of what was taught. However, the study authors hypothesized that the mechanism for change in clinical outcomes was different due to the different content of the module. That some studies that applied the mindfulness only module and demonstrated improved clinical outcomes suggests that increased mindfulness may have been instrumental in improving clinical outcomes in those studies.

The amount of exposure to mindfulness was found to be instrumental in the amount of clinical change. Soler et al. (2012) noted that there was a correlation between longer formal mindfulness practice and reduced depressive and confusion symptoms. This suggests that the way in which participants engaged in mindfulness has an effect on the outcome. Similarly, Feliu-Soler et al. (2014) found that more mindfulness practice correlated with a greater sense of calm and sense of control.

5 | DISCUSSION

The review of these 11 studies offers some evidence that engagement in mindfulness as taught in DBT does increase the level of mindfulness, albeit with more evidence for some facets of mindfulness than others. The facets of accepting without judgement/non-judging and non-reactivity (reduced impulsivity) were most commonly

identified as increasing after a DBT intervention. These results need to be understood in the context of the differences in the intervention offered, with some participants learning all DBT skills while others learnt only the mindfulness module, and it may be that learning the other DBT skills has a positive effect on developing mindfulness overall. Bass et al. (2014) identified, through a comparison of mindfulness-based interventions, that in DBT, priority was given the acceptance element of mindfulness. This observation seems to be borne out in the outcomes of the clinical studies, with accepting without judgement being identified as having been most commonly increased after treatment. Furthermore, Jennings and Apsche (2014) suggested that the mindfulness elements of DBT were focussed specifically on reducing emotional reactivity, being non-judgemental about experience and increasing acceptance of the present. Therefore, the increase in accepting without judgement/non-judging and non-reactivity in particular may well be due to the way in which mindfulness is taught in DBT.

Although there is evidence for an increase in many of the facets of mindfulness through engaging with mindfulness in DBT, this alone does not demonstrate the clinical effectiveness of mindfulness in DBT. Therefore, the second objective of this review was to establish if there was evidence in the studies of improvements in clinical outcomes.

The cultivation of mindfulness has been shown, in some of the studies included in this scoping review, to have a direct impact on clinical outcomes, adding to the evidence that mindfulness is inversely associated with symptoms of BPD. Specific facets of mindfulness seem to be more potent than others (non-judgement and act with awareness), and it is not clear whether these need to be taught within wider mindfulness teaching or whether they would be just as potent if taught separately. Robbins (2002) suggested that mindfulness may be useful to those with BPD symptoms because it may reduce levels of rumination, increase the capacity to enjoy small pleasures and enhance awareness of impulses and the ability to stay grounded in the presence of emotional distress. That studies detected a lower frequency of improvement in the facets of observe, describe and act with awareness may indicate that participants would not benefit from the full range of the potential benefits of mindfulness as outlined by Robbins (2002). However, experiencing an increase in accepting without judgement/non-judging and non-reactivity, which were detected more often in the studies, may be the facets of mindfulness that underpin the mechanisms of change as described by Lynch et al. (2006).

Wupperman et al. (2008) provided evidence that mindfulness as a trait correlated negatively with features of BPD within a non-clinical population, a finding which was added to by O'Toole et al. (2012) who found a positive correlation between self-reported mindfulness and emotional well-being and a negative correlation to health care usage (sample: 165 women with diagnosed with BPD). Other studies have linked BPD symptoms to characteristics that would seem at odds with being mindful, characteristics such as thought suppression (Sauer & Baer, 2009), impulsivity and emotional dysregulation (Chapman et al., 2008). The findings of this scoping review are in keeping with

these findings—that increase in mindfulness is associated with decreasing BPD symptoms.

The findings of this scoping review suggest that offering DBT-S or DBT-M can increase some or all of the facets of mindfulness in clinical populations and that these increases can lead to improved clinical outcomes. This is in line with these previous findings that correlated low trait mindfulness with symptoms of BPD. In particular, acting without judgement and non-reactivity appear to be particularly potent in the reduction of psychiatric symptoms.

6 | CONCLUSION

The outcomes of the reviewed studies found that mindfulness seems to have a part to play in the overall effectiveness of DBT, although the specific mechanisms of change and overall effect size have not been established due to small sample sizes and lack of controls in some of the studies. It is of interest that accepting without judgement and non-reactivity seem to play a role in the mechanism of change. As the mindfulness in DBT is focussed on awareness and acceptance of emotional states (Stanton & Dunkley, 2019) as opposed to thought diffusion (ACT) or insight (MBCT), it seems that the DBT mindfulness interventions are eliciting change in line with the theoretical mechanisms of change. More research would be necessary to establish the potency and application of each facet of mindfulness to allow DBT practitioners to tailor the application of mindfulness accordingly, based on the relative effectiveness of the constituent parts. However, it is important to bear in mind that mindfulness in DBT is a constituent of the whole, and that researching it as a separate part may be somewhat misleading about how it adds to the efficacy of DBT overall.

6.1 | Limitations

This scoping review is not a meta-analysis, and therefore, the effect size of increased mindfulness across papers or effect size of mindfulness on clinical outcomes has not been established. The review has not formally assessed the quality of the evidence and therefore does not assess the findings of each study as more or less valuable. Although every effort was made to identify all relevant literature, there may be studies that have not been considered in the review.

CONFLICT OF INTEREST

None.

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