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Exploring the Effects of the Mindfulness and Countering Emotional Behaviors Modules From the Unified Protocol on Dysregulated Anger in the Context of Emotional Disorders

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Dysregulated anger in the context of emotional (e.g., mood, anxiety, related) disorders is associated with treatment attrition and a lower likelihood of responding to extant treatments. Therefore, there is a need to identify the most effective skills for targeting this anger and prioritize their delivery in treatment with the hope of producing more potent interventions. The current study explored the specific effects of two treatment skills (mindfulness and countering emotional behaviors) in isolation and combination as interventions for dysregulated anger using single-case experimental design. Patients were randomized to a 2- or 4-week baseline with no intervention applied and then to the first treatment skill received. All patients subsequently completed the alternate treatment skill and 1 month of follow-up. Results suggested the first module had clinically meaningful effects for five patients and the second module produced incremental improvement for five patients. Visual inspection and effect sizes indicated mindfulness produced greater reductions in anger when delivered in isolation compared to countering emotional behaviors (d = 0.96, 0.33, for mindfulness and countering emotional behaviors, respectively). With regard to the second module, more patients (n = 4) experienced a reduction in anger in response to mindfulness than to countering emotional behaviors (n = 1); effect sizes indicated significant improvements in response to both modules (d = 0.83, 0.72, for mindfulness and countering emotional behaviors, respectively). Taken together, results suggest mindfulness may be a more efficacious intervention for anger than countering emotional behaviors. Implications of these results for addressing dysregulated anger in treatment are discussed.

Keywords: anger; emotional disorders; transdiagnostic treatment; dismantling

Growing literature suggests dysregulated anger (defined here as the persistently distressing and interfering experience and/or expression of anger) is common in individuals with emotional disorders (e.g., anxiety, depressive, trauma-related, obsessive-compulsive, and borderline personality disorder; see Cassiello-Robbins & Barlow, 2016, for a review). Notably, dysregulated anger in this context is associated with greater symptom severity and higher diagnostic comorbidity (Cassiello-Robbins et al., 2018). It is also associated with treatment attrition and a lower likelihood of responding to treatment for

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emotional disorders (Cassiello-Robbins et al., 2015, 2018; Erwin, Heimberg, Schneier, & Liebowitz, 2003). For example, Erwin et al. noted a relationship between anger and attrition with moderate effect sizes (d = 0.63, 0.78, for angry reaction and angry temperament, respectively), and Cassiello-Robbins et al. (2015) reported a 21% increase in likelihood of attrition for each 1-point increase on a measure of aggression. While the relationship between anger and attrition appears notable, anger may also serve as a proxy for other variables known to impact attrition, such as symptom severity. With regard to treatment outcome, Cassiello-Robbins et al. (2018) indicated patients reporting higher levels of anger were 17% less likely to respond to treatment for anxiety. These findings underscore the need to target dysregulated anger during treatment for emotional disorders—yet, it has remained largely underrecognized and unaddressed (Cassiello-Robbins & Barlow, 2016).

Outside the context of emotional disorders, a number of treatments exist for dysregulated anger and research that generally support the use of cognitive-behavioral therapy (CBT) to address this problem (Lee & DiGiuseppe, 2018). However, there are two issues of note when considering existing CBT treatments for anger. First, results of a meta-analysis indicate generalizability to emotions beyond anger is limited and these anger-focused treatments often have limited impact on anxiety and depression (DiGiuseppe & Tafrate, 2003). Thus, a different treatment approach may be warranted for patients who experience difficulties with anger and an emotional disorder. Second, the specific elements of extant treatments that are most effective for dysregulated anger remain unknown. Studies typically examine the effects of multicomponent CBT pre-/posttreatment inhibiting the ability to draw conclusions about the effects of a single treatment component on anger. Given research suggesting patients with dysregulated anger are at increased risk for attrition, there is a need to identify the most potent treatment components and prioritize their delivery in treatment. Taken together, literature suggests patients with dysregulated anger in the context of an emotional disorder are not maximally benefiting from extant interventions and may require a different intervention strategy.

The Unified Protocol for Transdiagnostic Treatment of Emotional Disorders (UP; Barlow et al., 2018) may represent a promising approach. This CBT was designed to parsimoniously target the full range of emotional disorders by intervening on shared vulnerabilities. Specifically, the UP is aimed at reducing the aversive, avoidant responses to intense emotional experiences that paradoxically increase their frequency and maintain symptoms in the long term (Sauer-Zavala & Barlow, 2014). Accumulating evidence suggests the UP is an efficacious intervention for a range of emotional disorders (see Sakiris & Berle, 2019, for a review). Preliminary evidence suggests the UP helps remediate symptoms of borderline personality disorder (Sauer-Zavala, Bentley, & Wilner, 2016), which has been described as an emotional disorder (Sauer-Zavala & Barlow, 2014), and includes dysregulated anger as a diagnostic criterion.

Dysregulated anger clearly fits within the UP framework for treating emotional disorders as individuals often demonstrate aversive reactions to the experience of anger (Fava, Anderson, & Rosenbaum, 1990), along with efforts to escape or avoid this emotion (Gardner & Moore, 2008). For example, patients may describe "exploding" (i.e., throwing things, shouting) as a way to "release the tension" associated with feeling angry. Additionally, the UP's focus on emotions (rather than disorder symptoms) allows clinicians to not only address the affective states that are typically present (e.g., anxiety in generalized anxiety disorder) but also other dysregulated emotions that may occur (e.g., anger, guilt) using the same treatment technique(s). In the context of a large UP efficacy trial for anxiety disorders (Barlow et al., 2017), small reductions in anger were observed (Cassiello-Robbins et al., 2018), though these changes were not significant. These results may be due to the fact that the sample did not endorse high levels of baseline anger, likely because elevated levels of this emotion were not an inclusion criterion. Additionally, it is possible this emotion was not explicitly identified as a treatment target—despite the applicability of the UP skills across emotions, therapists may have concentrated on anxiety.

Given the theoretical promise of using a transdiagnostic, emotion-focused treatment for dysregulated anger, along with the limitations of previous studies and treatments (i.e., anger not assessed, individuals with high anger not recruited), additional empirical investigation is needed. Specifically, there is a need to identify the most efficacious treatment components with the hope of reducing dysregulated anger in emotional disorders as efficiently as possible, given its association with treatment attrition (Cassiello-Robbins et al., 2015). Two therapeutic skills may be particularly relevant to anger: mindfulness and behavior change.

Several aspects of mindfulness make it a promising intervention for anger. Mindfulness may increase emotional awareness, allowing individuals to observe their anger nonjudgmentally without engaging in unhelpful emotion regulation strategies (Baer,

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2003). Additionally, research suggests mindfulness can interrupt anger rumination, a process that often upregulates anger (Raes & Williams, 2010). Beyond mindful awareness, explicitly changing behaviors may also be useful. A long-standing principle of emotion science suggests that the most effective way to change an emotion is often to change its action tendency (Barlow, 1988). Evidence indicates replacing maladaptive anger-driven behavior with adaptive behavior (i.e., taking a walk instead of yelling) can result in reduced emotional intensity (Denson, DeWall, & Finkel, 2012; DiGiuseppe, 2011). In a trial of dialectical behavior therapy, which contains a mindfulness component, as well as skills dedicated to helping patients change the action tendencies associated with dysregulated emotional responses, patients reported reductions in anger (Neacsiu, Rompogren, Eberle, & McMahon, 2018). This trial provided support for the potential of treating anger in the context of an emotional disorder but did not analyze the unique contribution of either treatment component.

Present Study

Although interventions for reducing anger have been tested (see Lee & DiGiuseppe, 2018, for a review), they have not been explicitly developed to also address co-occurring emotional disorders. The UP was developed to teach emotion regulation skills and has been primarily tested with patients who have primary diagnoses of anxiety or depression. The aim of the present study is to examine the effects of two treatment components in the UP (mindfulness and behavior change) on anger in the context of emotional disorders. Component analyses allow for an understanding of the unique effects of each treatment element, ensuring that the most potent skills are included in any intervention.

To achieve these aims, patients were randomized to treatment beginning with four sessions of mindfulness or behavior change and then received the alternate skill. We predicted (a) each module alone would have clinically meaningful effects on anger, (b) incremental gains would be observed following the introduction of the second module, and (c) gains would be maintained during a 1-month follow-up period. Finally, given the transdiagnostic nature of the intervention, we predicted patients would also see improvements in anxiety and depression.

Method

PATIENTS

An Institutional Review Board approved all study procedures and patients provided informed consent prior to participating. Patients were recruited from a university-affiliated treatment facility, as well as online (e.g., Craigslist), and were included in the study if they were at least 18 years old, met fifth-edition *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychiatric Association, 2013) criteria for a primary diagnosis of at least one anxiety, obsessive-compulsive, trauma-related, or unipolar depressive disorder, and were above the 75th percentile for at least one of the Anger Expression (in or out) or Anger Control (in or out) subscales on State–Trait Anger Expression Inventory (STAXI; Spielberger, 1999; see "Measures"). The 75th percentile was chosen because it indicates a level of anger that interferes significantly with functioning (Spielberger & Reheiser, 2004). Patients taking psychotropic medications were included if they met criteria for stability at a particular dose (e.g., 8 weeks of a selective serotonin reuptake inhibitor) and were willing to maintain a stable dose throughout treatment. Individuals were excluded if they presented with symptoms requiring immediate prioritization in treatment (e.g., suicidal intent) or were currently undergoing psychological treatment for anger, anxiety, or depression. Patients were also excluded if they received eight or more sessions of CBT in the past 5 years due to concern about carryover effects from prior treatment.

In total, 16 patients consented to participate in the study. Patient flow is depicted in Supplemental Figure S1. One patient did not meet the STAXI inclusion criteria, three dropped out during the baseline period (see "Study Design"), and two were withdrawn by the principal investigator (CCR). One patient requested to be withdrawn because he did not feel treatment was helping him and the other was withdrawn due to inability to regularly attend sessions. All of the patients who did not complete the study were male and Caucasian. Four of these patients indicated an income of over $100,000 per year and one reported his income as $25,000–50,000. Additionally, those who did not complete tended to be older ($M = 50.6$, $SD = 14.77$) than the completers ($M = 35.5$, $SD = 14.91$), although this difference was not statistically significant, $t(13) = 1.85$, $p = .09$. There did not appear to be meaningful differences in attrition based on primary diagnosis, number of comorbid diagnoses, illness severity, or mode of anger expression (see "Measures"). Demographic characteristics for the 10 patients who completed the study are displayed in Table 1.

STUDY DESIGN

This study utilized single-case experimental design (SCED), a methodology that provides a powerful

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and cost-effective framework in which to conduct research aimed at isolating treatment effects (Barlow, Nock, & Hersen, 2009). In SCEDs, each patient acts as his or her own control, serving as a unique experiment and providing strong internal validity. Replication of treatment effects across patients provides preliminary external validity. Thus, SCEDs facilitate identification of optimal treatments and causal inferences regarding the effects of specific treatment components on emotions and behaviors (Barlow et al., 2009).

This study employed a counterbalanced, randomized, combined-series (multiple baseline and phase change) design, which allows for both within- and between-subject comparisons. Interested patients completed a brief phone screen; those who were eligible attended an in-person appointment where they provided informed consent and completed an assessment to confirm eligibility. Patients from the community completed a diagnostic interview (see "Measures") in order to confirm the presence of an emotional disorder. Those referred directly from the treatment facility did not complete a diagnostic assessment, as one is administered as part of standard intake procedures; these individuals provided consent for the clinic to share diagnostic information with the study. All patients completed self-report questionnaires online via Qualtrics, a survey platform designed for research data collection (www.qualtrics.com).

Eligible patients began study procedures and completed four phases (baseline, first treatment module, second treatment module, follow-up). Patients were randomized to a 2- or 4-week baseline phase during which they completed online questionnaires. The baseline phase served as a control phase to establish anger levels and symptom severity, with no intervention applied. Varying the length of the baseline phase facilitated an assessment as to whether changes in symptoms occurred only when a treatment module was introduced. After baseline, patients were randomized to receive either the mindful emotion awareness or the behavior change (countering emotional behaviors) module of the UP for four sessions. Patients then received the alternate module (i.e., if they received mindfulness, they received countering emotional behaviors and vice versa). All patients completed 1 month of follow-up to examine the duration of treatment effects and received up to $100 based on their compliance with the online assessments.

INTERVENTIONS

The mindful emotion awareness (i.e., mindfulness) and countering emotional behaviors modules of the UP (Barlow et al., 2018) were used as the basis for intervention content. While modifications from the original UP were kept to a minimum, two are notable. First, each module was delivered over four sessions instead of the typical one or two. This change was made because prior research indicates patients achieve adequate acquisition of individual UP skills in four sessions (Sauer-Zavala et al., 2017). Second, references to other UP chapters or content were removed from the workbook.

The UP modules are described in detail elsewhere (Payne, Ellard, Farchione, Fairholme, & Barlow,

Table 1
Patient Characteristics

Patient	Age	Sex	Race	Ethnicity	Principal Dx	Additional Dx	Psych med	AX	Referral source	Income
101	26	F	C	NH	OSA (sep) [a]	GAD, PDD, SOC	N	AXI	Tx center	25–50k
105	24	M	A	NH	GAD	PTSD, MDD, SOC, PD, AUD, SUD (MJ)	N	AXI	Internet	50–75k
106	24	F	C	NH	SOC	GAD, MDD, OCD, BDD	N	AXI/ACO	Tx center	<25k
107	28	F	AA	NH	SOC	GAD, PTSD, PDD, SP	N	AXI	Tx center	<25k
108	67	F	C	NH	PTSD	GAD, SP, SP	N	AXO	Internet	75–100k
109	27	F	A	NH	OSA (GAD) [a]	MDD	N	AXO	Tx center	25–50k
112	33	M	AA	NH	GAD		Y	AXO	Internet	25–50k
113	32	F	AA	NH	GAD	PDD	N	AXI/ACO	Internet	50–75k
114	36	F	AA	NH	SOC	AG, BPD	N	AXO	Internet	50–75k
115	58	M	C	NH	GAD	Hoarding, MDD	Y	AXI/ACO	Internet	>100k

Note. Only clinical diagnoses presented. Dx = diagnosis; F = female; M = male; A = Asian; AA = African American/Black; C = Caucasian; NH = non-Hispanic; GAD = generalized anxiety disorder; AG = agoraphobia; PD = panic disorder; SOC = social anxiety disorder; PTSD = posttraumatic stress disorder; SP = specific phobia; MDD = major depressive disorder; OSA = other specified anxiety disorder; SSD = somatic symptom disorder; BPD = borderline personality disorder; PDD = persistent depressive disorder; AUD = alcohol use disorder; SUD = substance use disorder; MJ = marijuana; BDD = body dysmorphic disorder; sep = separation; N = no; Y = yes; AX = anger expression; AXI = anger expression–in subscale of STAXI; AXO = Anger Expression-Out subscale of STAXI; ACO = Anger Control-Out subscale of STAXI; STAXI = State–Trait Anger Expression Inventory; Tx center = patient referred from university-affiliated treatment facility; Internet = patient responded to online ad for study; Income = annual household income.

[a] The diagnosis in parentheses denotes the diagnosis that the patient's presentation most closely resembled.

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2014); a brief summary of the two modules used in this study is included here. The mindful emotion awareness module provides psychoeducation about engaging in nonjudgmental, present-focused awareness and utilizes mindfulness exercises (e.g., meditation, mindful mood induction, anchoring in the present) to help patients apply these principles to the experience of strong emotions in their lives. The countering emotional behaviors module seeks to help patients reduce reliance on avoidance-based emotion regulation strategies by helping them identify when they engage in such efforts, and encouraging patients to engage in alternate actions (e.g., whispering instead of yelling) that keep them in contact with an emotion. Such behavior change can reduce the perception of the emotion as aversive, thus facilitating distinction of distress in response to strong emotions.

Sessions occurred once per week and were 50–60 minutes long. The study therapist (CCR) was previously certified in the delivery of the UP by the Unified Protocol Institute (http://www.unifiedprotocol.com/). Treatment sessions were audio recorded and 20% were randomly selected and rated for adherence to the UP protocol, competence (e.g., time management), and the delivery of non-UP content. Sessions were rated by two senior graduate students certified in the delivery of this protocol via the same certification process as the study therapist. Average session adherence was high (M = 97.81%, SD = 5.04) as was competence (M = 4.67, SD = 0.49; on a scale of 0 [*poor*] to 5 [*excellent*]). No session included non-UP content.

MEASURES

Diagnostic Measure

This measure assessed the presence of DSM-5 emotional disorders.

Adult Anxiety Disorders Interview Schedule for DSM-5 (ADIS-5). The ADIS-5 (Brown & Barlow, 2014) is a semistructured, diagnostic clinical interview that focuses on current and lifetime symptoms of DSM-5 anxiety, mood, obsessive-compulsive, somatoform, trauma- and stressor-related, and substance use disorders. Only current diagnoses were assessed for this study. The study assessor was trained using the methods described in Brown, DiNardo, Lehman, and Campbell (2001), which has produced reliability ratings ranging from .31 (dysthymia) to .81 (panic disorder with agoraphobia).

Weekly Measures

These measures were completed weekly throughout the study. During the treatment phase, measures were completed prior to the start of each session. During baseline and follow-up, patients were e-mailed the survey weekly and completed it at home.

State–Trait Anger Expression Inventory–2. The STAXI (Spielberger, 1999) consists of 57 statements and asks individuals to rate how much each applies to them on a scale from 1 (*not at all*) to 4 (*very much so*). The STAXI has 12 subscales and items for each subscale are summed with higher scores indicating greater severity. Four subscales were used in this study: Anger Expression-Out (AXO; i.e., expression of anger in an outwardly negative or poorly controlled manner), Anger Expression-In (AXI; i.e., anger suppression), Anger Control-Out (ACO; i.e., expending energy to monitor and control expressions of anger), and Anger Control-In (ACI; i.e., how often someone attempts to relax or calm down when angry). These subscales were chosen because they correlate with targets of treatment (i.e., ineffective anger regulation strategies, dysregulated anger, hostility). For example, AXO correlates with physical and verbal aggression, as well as anger and hostility (rs = .42–.62, ps < .001), and AXI correlates with anger and hostility (r = .19, .38, respectively, ps < .01; Lievaart, Franken, & Hovens, 2016). Subscales included in this study have shown internal consistency with Cronbach's alpha ranging from .72 (AXI) to .84 (AXO; Lievaart et al., 2016). This measure has been widely used in treatment studies with the anger expression scales showing change over the course of CBT (Cohen's d = 0.98–1.13), suggesting these subscales are sensitive to change (Shea, Lambert, & Reddy, 2013).

Overall Anxiety Severity and Impairment Scale (OASIS). The OASIS (Norman, Hami Cissell, Means-Christensen, & Stein, 2006) is a five-item continuous assessment that provides a measure of anxiety-related symptom severity and impairment. Items are scored on a 0–4 scale with higher scores indicating greater levels of severity and impairment. Studies have shown this measure to have Cronbach's alpha of .80 and test–retest reliability of .82. Moore et al. (2015) indicated that this measure is sensitive to change because changes in the OASIS correlated with changes in other measures of anxiety, including measures of obsessive-compulsive disorder (r = .72, p < .001) and worry (r = .59, p < .01), during CBT.

Overall Depression Severity and Impairment Scale (ODSIS). The ODSIS (Bentley, Gallagher, Carl, & Barlow, 2014) is a direct adaptation of the OASIS. The ODSIS is a five-item continuous measure of depression-related symptom severity and impairment. Items are scored on a 0–4 scale; higher scores indicate greater severity and impairment. The

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ODSIS has demonstrated Cronbach's alpha of .94 among outpatients (Bentley et al., 2014). Osma et al. (2019) reported change in the ODSIS during a course of CBT significantly correlated with change in a reference measure, the Beck Depression Inventory–II (r = .56, p < .001), and suggested this measure is sensitive to change.

DATA-ANALYTICAL STRATEGY

When scoring measures, item-level imputation, in which the mean of a participant's response was substituted for the missing value, was used when 30% or fewer of items on a given scale were unanswered (Fox-Wasylyshyn & El-Masri, 2005). Data analyses were conducted in accordance with established guidelines for analyzing SCED data using both visual inspection and statistical methods (Barlow et al., 2009). Visual inspection is considered a conservative approach to data analysis (Kazdin, 2011). To conduct these analyses, data are plotted graphically and visually assessed for change across study phases. Data were plotted with lines connecting data points within each phase, as well as horizontal, dashed lines indicating the mean for each measure within each phase. Changes in level (i.e., mean) across phases indicate the magnitude of intervention effects. Changes in slope indicate the rate of change.

In addition to visual inspection, effect sizes were calculated to estimate the magnitude of change on all measures across patients within each treatment condition using a d statistic developed for SCED studies (Shadish, Hedges, & Pustejovsky, 2014). These analyses examined the specific effects of each skill when delivered first in treatment, as well as any incremental benefits of adding a second skill, and any continued improvements during the follow-up period. Thus, the following comparisons were made: (a) the first treatment module compared to baseline in order to determine the effects of the skill alone, (b) the second skill compared to both baseline and the previous module to determine its incremental benefits, and (c) follow-up data compared to all prior assessments to evaluate changes occurring during this phase. This statistic provides a correction for autocorrelation of data, which is often present in SCED trials and has a correction for small sample sizes (Shadish et al., 2014). Effect sizes were calculated using the DHPS SPSS macro (Shadish, 2015). After obtaining a value of d, 95% confidence intervals (CI) were calculated using the following formula: d +/– 1.96* sqrt(Var). An effect size was considered statistically significant at p < .05 if the CI did not include zero. This d statistic uses the same metric as those commonly used in between-subject studies—therefore, they were interpreted with 0.2, 0.5, and 0.8 representing small, medium, and large effects, respectively (Cohen, 1988).

Results

PRIMARY OUTCOME: ANGER

Visual Inspection

Whereas the anger control STAXI subscales were used as inclusion criteria, only the expression subscales are included in the data analyses due to the small number of elevated anger control subscales present in the sample (n = 3), which inhibited the ability to draw meaningful conclusions about the effects of treatment on anger control. All patients had an elevated anger expression subscale and thus each patient's clinically elevated STAXI expression subscale (AXI or AXO) was used in analyses.

Visual inspection of the baseline data showed no systematic improvements in anger during this phase. For patients assigned to receive mindful emotion awareness first (see Figure 1), visual inspection suggests this module was associated with reductions in anger for three out of five patients (101, 107, 109). The introduction of the second module (countering emotional behaviors) appeared to produce incremental improvements for only one patient (115). For the other four patients, the majority of data during the second module overlapped with the first, suggesting their initial gains were maintained, but there were not incremental benefits of adding the countering emotional behaviors after the mindful emotion awareness module. During the follow-up phase, two patients (107[1], 115) continued to maintain their treatment gains, whereas two patients (101, 109) showed a worsening of anger symptoms; both patients attributed this deterioration to an increase in school-related stressors.

Of the five patients who began treatment with countering emotional behaviors, two (108, 112) showed changes in level and slope during the first four sessions (see Figure 2). After the introduction of the second skill (mindful emotion awareness), four out of the five patients (105, 108, 112, 113) demonstrated incremental reductions in anger. Four (105, 106, 108, 112) of the patients who received the countering emotional behaviors module first continued to show improvements during the follow-up phase of the study.

Effect Sizes

Effect sizes and 95% CIs are presented in Table 2. The STAXI AXI and AXO subscales were combined

[1] Two out of four follow-up assessments are available for patient 107 because this patient completed assessments only at the time points corresponding to the last two weeks of follow-up.

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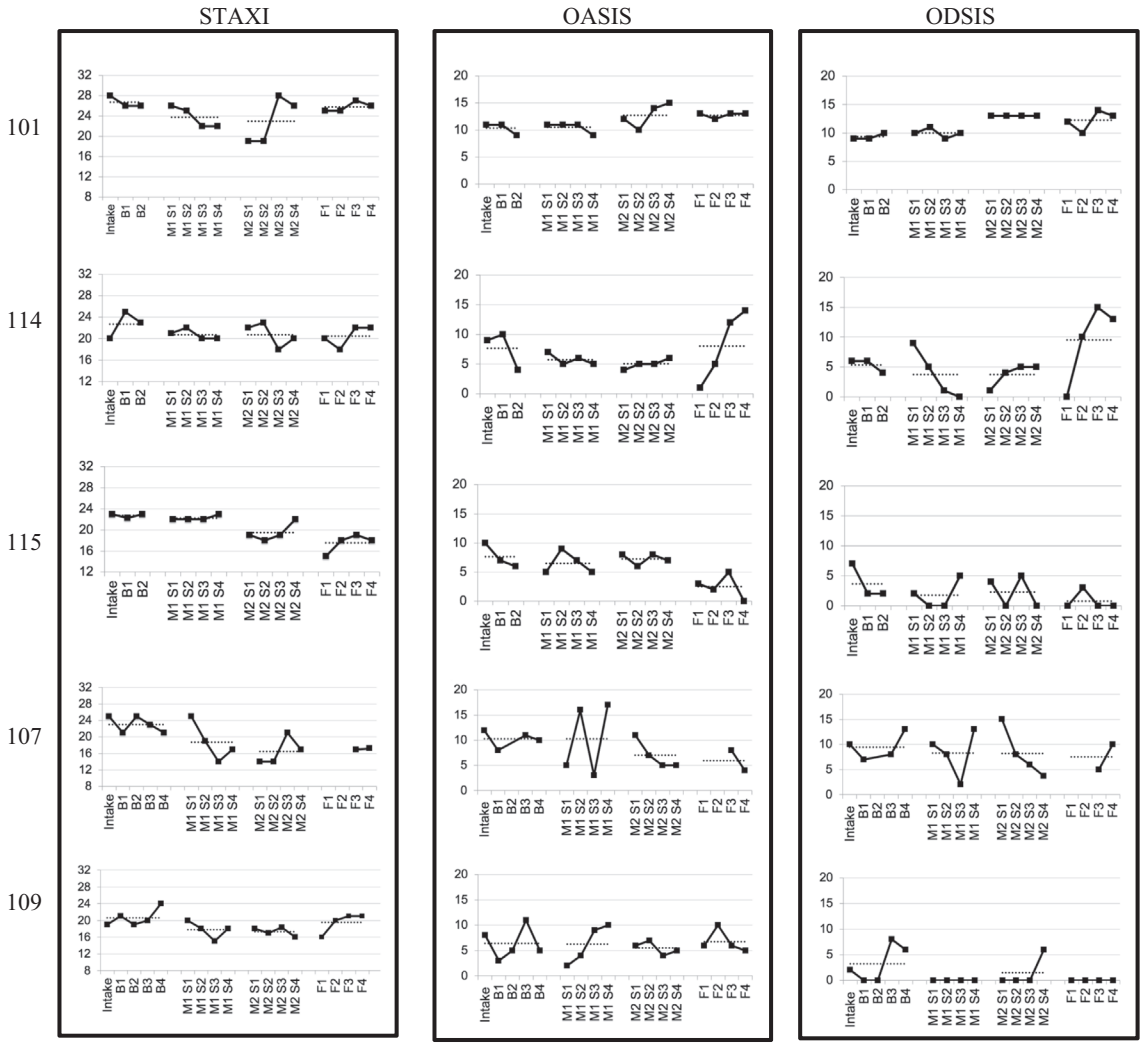

FIGURE 1 STAXI, OASIS, and ODSIS data for patients assigned to receive the mindful emotion awareness module first. *Note.* Graphs are ordered by baseline length. B = baseline; M1 = first module; M2 = second module; S = session; F = follow-up; M = mindful emotion awareness; EB = countering emotional behaviors; OASIS = Overall Anxiety Severity and Impairment Scale; ODSIS = Overall Depression Severity and Impairment Scale; STAXI = State–Trait Anger Expression Inventory. Patients 101, 107, and 115 had elevated anger expression in, 109 and 114 had elevated anger. expression out.

in these analyses because they are scored on the same scale. Delivery of the mindful emotion awareness module first was associated with a large, significant reduction in anger, whereas receiving the countering emotional behaviors module first did not produce significant change. The addition of the countering emotional behaviors module to treatment was associated with a large reduction in anger and the addition of mindful emotion awareness was associated with a moderate reduction. Patients who began treatment with the mindful emotion awareness skill did not continue to show gains in follow-up, whereas patients in the other condition showed a significant reduction in anger that was large in magnitude.

SECONDARY OUTCOMES: ANXIETY AND DEPRESSION

Visual Inspection[2]

On the OASIS, two of the five patients (114, 115) who began treatment with mindful emotion awareness showed a reduction in level of anxiety during this skill (see Figure 1). However, for both patients, their data continued to overlap with the baseline phase suggesting minimal improvement. The addition of the countering emotional behaviors module yielded improvements for one patient (107), although this data also continued to overlap with

[2] Due to a technical error, patient 107's OASIS and ODSIS scores were not recorded for the second week of baseline and patient 105's ODSIS score was not recorded for the last treatment assessment.

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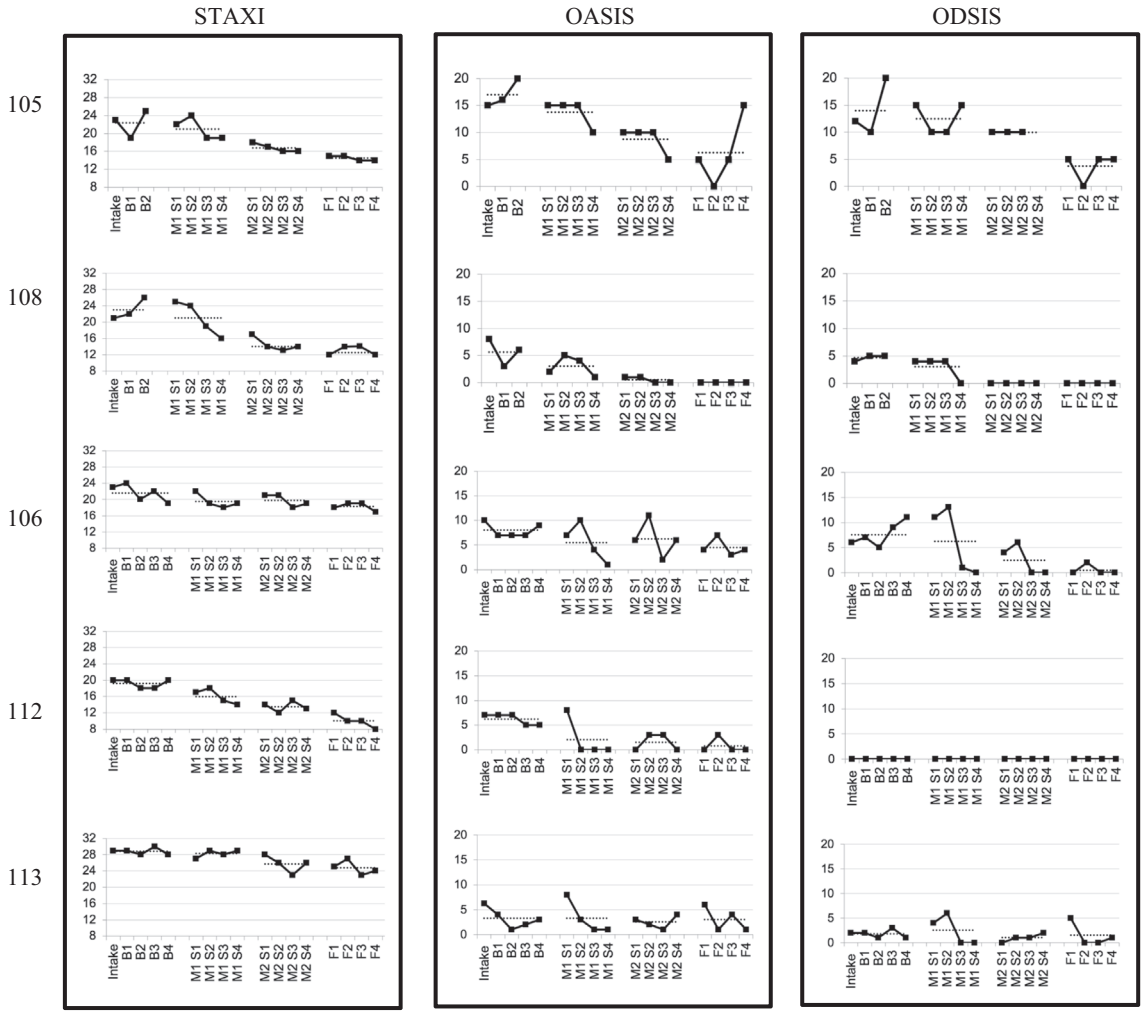

FIGURE 2 STAXI, OASIS, and ODSIS data for patients assigned to receive the countering emotional behaviors module first. *Note.* Graphs are ordered by baseline length. B = baseline; M1 = first module; M2 = second module; S = session; F = follow-up; M = mindful emotion awareness; EB = countering emotional behaviors; OASIS = Overall Anxiety Severity and Impairment Scale; ODSIS = Overall Depression Severity and Impairment Scale; STAXI = State–Trait Anger Expression Inventory. Patients 105, 106, and 113 had elevated anger expression in, 112 and 114 had elevated anger expression out.

Table 2
Mean Summary Scores and Effect Sizes for All Outcomes

	Baseline	Module 1			Module 2			Follow-up		
	M (*SD*)	*M* (*SD*)	*d*	95% CI	*M* (*SD*)	*d*	95% CI	*M* (*SD*)	*d*	95% CI
Mindful emotion awareness, emotional behaviors (*n* = 5)										
STAXI	22.81 (2.61)	20.65 (3.17)	0.96*	[0.24, 1.68]	19.41 (3.52)	0.81*	[0.06, 1.56]	20.07 (3.50)	0.29	[-0.39, 0.97]
OASIS	8.33 (2.74)	7.85 (4.02)	0.18	[-0.38, 0.74]	7.50 (3.25)	0.18	[-0.24, 0.60]	7.33 (4.63)	0.18	[-0.25, 0.61]
ODSIS	6.06 (3.70)	5.74 (4.72)	0.30	[-0.23, 0.83]	5.70 (5.15)	-0.04	[-0.49, 0.41]	5.83 (6.06)	-0.07	[-0.47, 0.33]
Emotional behaviors, mindful emotion awareness (*n* = 5)										
STAXI	23.04 (3.98)	21.15 (4.66)	0.33	[-0.14, 0.80]	18.05 (4.74)	0.72*	[0.11, 1.33]	16.10 (5.33)	0.81*	[0.10, 1.52]
OASIS	7.39 (4.67)	5.50 (5.24)	0.47	[-0.05, 0.99]	3.90 (3.75)	0.55*	[0.05, 1.05]	2.90 (3.70)	0.61*	[0.05, 1.17]
ODSIS	4.90 (5.18)	4.85 (5.48)	0.13	[-0.38, 0.64]	2.32 (3.77)	0.42	[-0.04, 0.88]	1.15 (2.03)	0.66*	[0.09, 1.23]

Note. All effect sizes were calculated such that positive *d* values indicate the expected direction of change (i.e., decreases in symptoms, increase in mindfulness, and decrease in use of emotional behaviors). OASIS = Overall Anxiety Severity and Impairment Scale; ODSIS = Overall Depression Severity and Impairment Scale; STAXI = State–Trait Anger Expression Inventory, clinically elevated anger expression subscales were used in these analyses.
* Significant improvement at $p < .05$.

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baseline and the previous phase. Further, patient 101 showed an increase in level indicating a worsening of anxiety during the second module. During the follow-up phase, patient 115 improved, whereas patients 114 and 109 deteriorated. Of the five patients who began treatment with countering emotional behaviors, four (105, 106, 108, 112; see Figure 2) showed improvements during this module. The addition of the second module resulted in additional significant reductions for patients 105 and 108. During follow-up, four patients in this condition (105, 106, 108, 112) saw additional improvements.

In terms of depression, three patients (109, 114, 115) who began treatment with mindful emotion awareness (see Figure 1) showed improvements on the ODSIS during this skill, and none of these individuals showed additional improvement during countering emotional behaviors (101 indicated worsening). During follow-up, 114 also worsened and 115 demonstrated continued improvement. In the other treatment group (i.e., those who began with countering emotional behaviors; see Figure 2), 112 had a floor effect present on this measure (i.e., very low levels of depression) so improvements in depression could not be observed. Patients 105, 106, and 108 improved during the countering emotional behaviors module and the addition of the second module was associated with additional improvements for four patients (105, 106, 108, and 113). During follow-up, patients 108 and 112 both reported no depression, 113 showed a slight increase in depression, and the other two patients (105, 106) showed additional improvements.

Effect Sizes

Table 2 provides the effect sizes and 95% CIs for secondary outcomes. None of the secondary outcome measures significantly changed during the first treatment module for either condition. Patients who received the mindfulness skill second showed significant improvements in anxiety during this skill, whereas patients who received the behavior change module second did not. Neither condition showed significant changes in depression during the second module. In contrast, during follow-up, patients who began treatment with the countering emotional behaviors module showed moderate to large improvements on all secondary outcomes, whereas patients in the alternate condition did not show any significant changes during this phase.

Discussion

The overarching goal of this study was to examine the specific effects of two transdiagnostic CBT skills from the UP—mindful emotion awareness and countering emotional behaviors—on dysregulated anger in the context of emotional disorders. Ten patients who met criteria for an emotional disorder and scored above the 75th percentile on the anger expression and/or control subscales of the STAXI completed study procedures and were randomized to begin treatment with either mindfulness or behavior change skills. To our knowledge, this is one of the first studies to recruit individuals with dysregulated anger *and* an emotional disorder diagnosis. The component analysis conducted is needed as identifying and prioritizing the most beneficial skills is relevant to providing treatment for this patient population that is at high risk of attrition (Cassiello-Robbins et al., 2015; Erwin et al., 2003).

By randomizing the length of the baseline phase, as well as which treatment skill was received first, some conclusions can be drawn about the effects of each skill in isolation on dysregulated anger. In support of the first hypothesis, visual inspection indicated that receiving either module first had clinically meaningful effects on anger for 5 out of 10 patients. Visual inspection and effect sizes indicated mindfulness produced more benefit than countering emotional behaviors when delivered in isolation.

With regard to the second hypothesis, incremental gains were observed for five patients during the second module. Visual inspection suggested more patients who received mindfulness second (four out of five) experienced incremental improvements than those who received countering emotional behaviors second (one out of five). Effect sizes indicated that the addition of the second module was associated with moderate reductions in anger for patients who received mindfulness second and large reductions for those who received countering emotional behaviors second. These results suggest that there is a benefit to receiving a second treatment skill. The presence of dysregulated anger is often associated with a more severe diagnostic presentation (see Cassiello-Robbins & Barlow, 2016, for a review) and more severe patients typically require more treatment sessions to improve—therefore, it is perhaps not surprising that four additional sessions resulted in continued benefit (Schneider, Arch, & Wolitzky-Taylor, 2015).

Interestingly, more patients showed a reduction in anger during mindfulness when it was delivered either first or second, which might suggest mindfulness results in greater reductions in anger than behavior change. This observation is supported by theoretical literature describing the use of mindfulness as an intervention for anger (e.g., Baer, 2003). However, because mindfulness was delivered at different points in treatment depending on a patient's randomization, the order in which treatments skills were delivered may also be relevant.

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For example, effect sizes indicated receiving mindfulness first was associated with a large reduction in anger during the module but no continued improvement during follow-up, whereas receiving it second was associated with a moderate reduction in anger during the module and large reductions in anger during follow-up. Mindfulness may simply be a more efficacious skill for treating anger or it is possible treatment effects are more robust when mindfulness is delivered second. One direction for future research is to further explore these possibilities. For example, a study might compare eight sessions of mindfulness to four sessions of countering emotional behaviors followed by four sessions of mindfulness in order to understand the importance (or lack thereof) of skill order.

Beyond the treatment sessions, and as predicted in the third hypothesis, many patients continued to see improvement during follow-up. Patients often see maintenance or improvement of their gains upon the cessation of treatment, likely because they have more time to utilize the skills learned (Bullis, Fortune, Farchione, & Barlow, 2014). This result was observed in the current study as many patients continued to improve during the follow-up phase.

As expected given the transdiagnostic nature of the intervention, improvements in anxiety and depression were also observed. Again, given the study design (i.e., randomization to baseline length and first treatment module), the clearest conclusions can be drawn about the effects of the first treatment skill on anxiety and depression. Visual inspection indicated that the countering emotional behaviors module, presented in isolation, resulted in greater improvements in anxiety than mindfulness, whereas the two modules produced fairly equivalent results with regard to improvements in depression.

These preliminary findings suggest mindfulness may be more efficacious for addressing anger, whereas countering emotional behaviors may be more efficacious for improving anxiety symptoms, and the two skills seem equally efficacious for reducing depressive symptoms. Thus, these results do not provide clear guidance as to which skills should be prioritized for individuals with emotional disorders who also endorse dysregulated anger. It is possible that different emotions respond differentially to treatment skills. Mindfulness may be effective for anger because it interrupts rumination, which often upregulates this emotion (Baer, 2003). On the other hand, most evidence-based treatments for anxiety involve teaching patients to approach, rather than avoid, feared stimuli that is in line with the countering emotional behaviors skills. Finally, treatments for depression, such as behavioral activation, involve countering emotional behaviors, whereas treatments such as mindfulness-based cognitive therapy teach mindfulness skills. As work on treatment personalization continues to evolve, treatment skills may be sequenced in order to address the most interfering emotion first. However, more research is needed to confirm the hypotheses presented here and determine the best way to personalize treatment.

Another option for providers might be to collaborate with the patient by identifying which emotion is most distressing and interfering, and then beginning with the indicated skill. Indeed, literature on shared decision making suggests patients would like to be involved in decisions regarding their mental health care (Eliacin, Salyers, Kukla, & Matthias, 2014). It is possible that including the patient in deciding which skill to prioritize in treatment would result in more efficacious treatment, though more research on the effects of shared decision making in the context of psychological treatment is needed (Joosten et al., 2008). On the other hand, there may be a benefit to targeting anger first in treatment in order try to increase treatment engagement (Cassiello-Robbins et al., 2015), given that dysregulated anger is associated with greater attrition. Future research could examine whether targeting anger first, by teaching mindfulness skills to address anger, or utilizing shared decision making to determine skill order results in improved treatment outcomes and retention.

The results of this study should be interpreted in the context of its limitations. While SCED provides a rigorous methodology for collecting and analyzing data, the sample size remains small. An advantage of SCEDs are their internal validity. Replication of effects across subjects provides some external validity. Further replication is needed to confirm the results of this study and ensure the effects seen are generalizable. Additionally, this study recruited patients with an emotional disorder and anger above the 75th percentile on relevant STAXI subscales. Generalizability of these results to patients with lower levels of anger remains to be seen.

There are several limitations related to assessment in this study. First, the STAXI is a measure of symptoms, whereas the ODSIS and OASIS focus on functional impairment. Therefore, these measures are assessing different aspects of improvement (symptoms vs. functioning). When evaluating the results related to anger, anxiety, and depression, it is important to keep in mind the outcome each measure assessed. Functional improvement can be more difficult to demonstrate than symptom improvement—therefore, some of the differences observed in how anger, depression, and anxiety

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responded to treatment could be related to how they were assessed. Second, all weekly assessments were completed online. While data suggest the measures used in this study have similar psychometric properties when delivered online (Bentley et al., 2014; González-Robles et al., 2018; Lievaart et al., 2016), we cannot rule out the possibility that online delivery impacted the quality of the data. Third, reliability data are not available for the adherence instrument used to assess therapist adherence to the UP and it is possible there were individual differences between the adherence raters. Additionally, the adherence raters were graduate students known to the principal investigator, which may have biased their assessment. Finally, though the ADIS-5 was administered using the methods described in Brown et al. (2001), reliability data on this measure were not collected for this study.

There was also differential attrition in the study sample with older, male, White patients being more likely to drop out. The patients who dropped out also tended to have a higher annual income than those who completed the study. Most patients dropped out during baseline and it is possible these patients had the resources to seek alternate treatment if they no longer wanted to continue in the baseline phase. However, research suggests men consistently seek psychological treatment at lower rates than women (e.g., Möller-Leimkühler, 2002). It is possible this is a patient subpopulation that is at higher risk for attrition, and further research aimed at identifying reasons for dropout, as well as developing strategies for retention, is of interest.

Finally, other CBT components were not examined in this study. Skills such as cognitive restructuring, interoceptive exposure, and emotion exposure could also be useful for treating dysregulated anger in patients with emotional disorders. The skills used in this study were chosen because of the strong theoretical evidence supporting their efficacy. However, it is prudent to continue examining the specific effects of other skills on dysregulated anger as such data have not yet been collected. More comprehensive dismantling work would be beneficial in order to personalize and streamline treatment for this patient population.

Overall, this study demonstrates the utility of applying transdiagnostic treatment elements to treat dysregulated anger in the context of emotional disorders. Results suggest that mindfulness skills may produce greater reductions in anger than behavior change and provide preliminary evidence for delivering this skill early in treatment. Additionally, data from this study inform directions for future research, such as additional dismantling work, that can continue to improve the efficacy of treatment for this patient population.

Supplementary data to this article can be found online at https://doi.org/10.1016/j.beth.2019.12.007.

Conflict of Interest Statement

Dr. Sauer-Zavala receives royalties from Oxford University Press in her role as an author of the treatment provided in this study (i.e., Unified Protocol).

Dr. Barlow receives royalties from Oxford University Press (which includes royalties for all five treatment manuals included in this study), Guilford Publications Inc., Cengage Learning, and Pearson Publishing. Grant monies for various projects including this one come from the National Institute of Mental Health, the National Institute of Alcohol and Alcohol Abuse, and Colciencias (Government of Columbia Initiative for Science, Technology, and Health Innovation). Consulting and honoraria during the past several years have come from the Agency for Healthcare Research and Quality, the Foundation for Informed Medical Decision Making, the Department of Defense, the Renfrew Center, the Chinese University of Hong Kong, Universidad Católica de Santa Maria (Arequipa, Peru), New Zealand Psychological Association, Hebrew University of Jerusalem, Mayo Clinic, and various American Universities and Institutes.

No other author claims any conflicts of interest.

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