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Cognitive-Behavioral Versus Supportive Psychotherapy for Intermittent Explosive Disorder: A Randomized Controlled Trial

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Few clinical trials have evaluated the efficacy of psychotherapy for Intermittent Explosive Disorder (IED). The present study tested the efficacy of a cognitive behavioral intervention (versus supportive psychotherapy) among adults with IED. In this randomized clinical trial, 44 participants with IED (22 men and 22 women) aged 20–55 years completed twelve 50-minute individual sessions of either a multi-component cognitive behavioral intervention for IED ($n = 19$) or a time equated supportive psychotherapy ($n = 25$). At baseline, posttreatment, and 3-month follow-up, all participants received the Overt Aggression Scale–Modified, which was conducted by an interviewer who was blind to the participant's study condition. During these visits, participants also completed self-report measures of relational aggression (Self-Report of Relational Aggression and Social Behavior), anger (State-Trait Anger Expression Inventory-2), cognitive biases (e.g., Social Information Processing Questionnaire Attribution and Emotional Response Questionnaire), and associated symptoms (e.g., Beck Depression Inventory). Primary study outcomes were aggressive behavior and anger. Though participants in both treatments tended to improve over time, the cognitive behavioral intervention was superior to supportive psychotherapy in decreasing aggressive behavior and relational aggression. These findings support the efficacy of a multicomponent cognitive behavioral intervention in treating aggression in IED.

Keywords: intermittent explosive disorder; cognitive-behavioral therapy; randomized controlled trial; aggression

AGGRESSIVE BEHAVIOR is a worldwide public health problem, costing billions of dollars annually in medical care and lost productivity (Corso et al., 2007). Though aggression is multidetermined, most acts of aggression are primarily "affective" in that they occur in direct response to anger/negative affect (Allen & Anderson, 2017). Occasional mild acts of affective aggression are normative (Kulper et al., 2015). However, excessive aggression may warrant a diagnosis of Intermittent Explosive Disorder (IED), the only psychological disorder for which excessive affective aggression is pathognomonic (American Psychiatric Association, 2013). IED is a common and serious disorder existing in about 2%–5% of the population (Coccaro & McCloskey, 2019). IED is also associated with considerable psychosocial impairment (Kulper et al., 2015; Rynar & Coccaro, 2018) and long-term health problems (McCloskey et al., 2010).

Despite its frequency and severity, the treatment research on IED is limited. Clinical trials examining the efficacy of SSRIs (e.g., Coccaro et al., 1997) as well as anticonvulsants/mood stabilizers (e.g., Mattes, 2008; Stanford et al., 2005) have produced mixed results. Fewer studies have evaluated psychosocial interventions for IED. Second-

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ary analysis of an early randomized controlled trial (RCT) evaluating the efficacy of a four-session cognitive behavioral treatment to reduce angry driving showed those with IED improved less than those without IED (Galovski & Blanchard, 2002). Apart from this, only three published studies have examined psychotherapy for IED, all of which have focused on variants of cognitive behavioral therapy (CBT).

A study of the efficacy of an 18-session CBT-based group IED intervention in Brazil showed that among treatment completers there was improvement on State-Trait Anger Expression Inventory scales (Costa et al., 2018). Though promising, this was a preliminary analysis, not an RCT, which limits interpretability of the results. Furthermore, aggression frequency and severity were not directly assessed, and the study only looked at individuals who completed treatment.

An RCT testing the efficacy of trauma-focused CBT (TF-CBT) for those with IED in post-conflict Timor-Leste found that, relative to the wait list group, the TF-CBT group showed decreased anger expression and increased anger control (Hewage et al., 2018). Furthermore, no participants in the TF-CBT group reportedly met criteria for current IED at 1-month follow-up. Again, these are promising results, though some limitations merit attention. All participants were required to have a trauma history (despite this not being a part of the IED criteria set), with about one fourth of all participants meeting full criteria for current PTSD, limiting generalizability to IED patients without severe trauma/PTSD. Also, changes in frequency and severity of aggressive acts were only indirectly evaluated via the IED interview used in the study. Finally, there was no comparison therapy condition; thus (as the authors note), no conclusions can be drawn with regard to the specificity of CBT in reducing anger and IED symptoms.

Another small RCT (McCloskey et al., 2008) examined the efficacy of individual and group therapy versions of a multicomponent CBT intervention for IED that was adapted from an 8-week "CRCST" manual that used cognitive restructuring, relaxation and coping skills training (aka imaginal exposure) to treat situational and general anger (Deffenbacher & Mckay, 2000). Modifications of the manual for use with individuals with IED included extending the treatment to 12 sessions, increasing the time spent on cognitive restructuring, adding a "time-out" intervention to resist aggressive impulses, devoting more time to imaginal exposure (six sessions), and including a greater emphasis on relapse prevention. When compared to a self-monitoring control group, participants randomized to individual and group CBT conditions showed greater decreases in anger as well as reductions in frequency and intensity of aggressive behavior, with those in the individual CBT condition also showing a greater decrease in hostile thoughts and increase in quality of life relative to the self-monitoring group (McCloskey et al., 2008). These gains were maintained at 3-month follow-up. Furthermore, 47% of participants in the individual CBT condition no longer met full IED criteria at the end of treatment compared to 13% in the group CBT condition and 7% in the self-monitoring condition (McCloskey et al., 2008).

Though there is preliminary support for the efficacy of CBT in reducing aggression in IED, these studies are limited by the lack of a psychotherapy comparison condition, precluding the ability to assess the extent to which treatment benefit was specific to the CBT versus nonspecific factors believed to be common to all forms of psychotherapy (e.g., empathy, warmth). These nonspecific factors have been shown to be more effective than waitlist and placebo controls and as effective as CBT in treating some psychopathology (Barth et al., 2013).

To address some of these gaps in the literature, a small RCT compared the efficacy of a 12-week individual multicomponent CBT intervention (CRCST; McCloskey et al., 2008) to supportive psychotherapy (SP) in the treatment of IED. Our primary predictions were that individuals receiving CRCST for IED would show a greater decrease in aggressive behavior and anger relative to participants receiving SP. Secondary predictions were that those in the CRCST condition would show greater decreases in relational aggression, anger expression, and negative social cognitions while increasing anger control relative to those in the SP condition.

Method

PARTICIPANTS

Participants consisted of 44 individuals (22 men and 22 women) aged 20 to 55 ($M = 36.64$, $SD = 10.57$) who met current DSM-5 IED criteria (American Psychiatric Association, 2013). Participants identified their primary racial/ethnic identity as Caucasian ($n = 25$), Black ($n = 10$), Hispanic ($n = 6$), Asian-American ($n = 1$), American Indian ($n = 1$) or "Other" ($n = 1$). Psychiatric disorders were diagnosed using structured clinical interviews (see measures). Recruitment involved media adver-

tisements and local referrals to our program, which was located within the Department of Psychiatry at a large midwestern medical school. Participants were excluded if they had a lifetime diagnosis of psychosis or bipolar disorder. Current substance dependence or major depressive disorders were also exclusionary as they can interfere with treatment, and are themselves associated with aggression (Bácskai et al., 2011; Liu & Cole, 2021). Additional exclusion criteria included current suicidal or homicidal ideation, recent use of psychotropic medication (past 2 months), or aggression treatment (past 6 months).

Of the 125 participants who completed the initial screen, 44 were eligible for randomization (CRCST = 19, SP = 25). Among individuals excluded (see Figure 1), most did not meet study criteria, with the lack of an IED diagnosis, current depression, or substance dependence being the most common reasons for exclusion. For those who refused to participate, most stated that they were not willing to make the time commitment. This was also the primary reason given among the participants who passed the screen but did not return for the full evaluation (among those who we were able to contact). The Institutional Review Board approved the protocol. All participants provided written informed consent prior to enrollment in the study.

THERAPISTS AND TREATMENT INTEGRITY

CRCST was provided by two master's-level therapists with 2 or more years of experience with CBT. SP was provided by two master's-level therapists, each with 2 or more years of experience with client-centered therapy. Dr. McCloskey (who has experience with both CBT and client-centered approaches) provided training on the treatment manuals for all study therapists. Study therapists had regular supervision to ensure protocol adherence. Dr. McCloskey provided primary supervision for CRCST. A licensed clinical social worker whose theoretical orientation was eclectic provided primary supervision for SP.

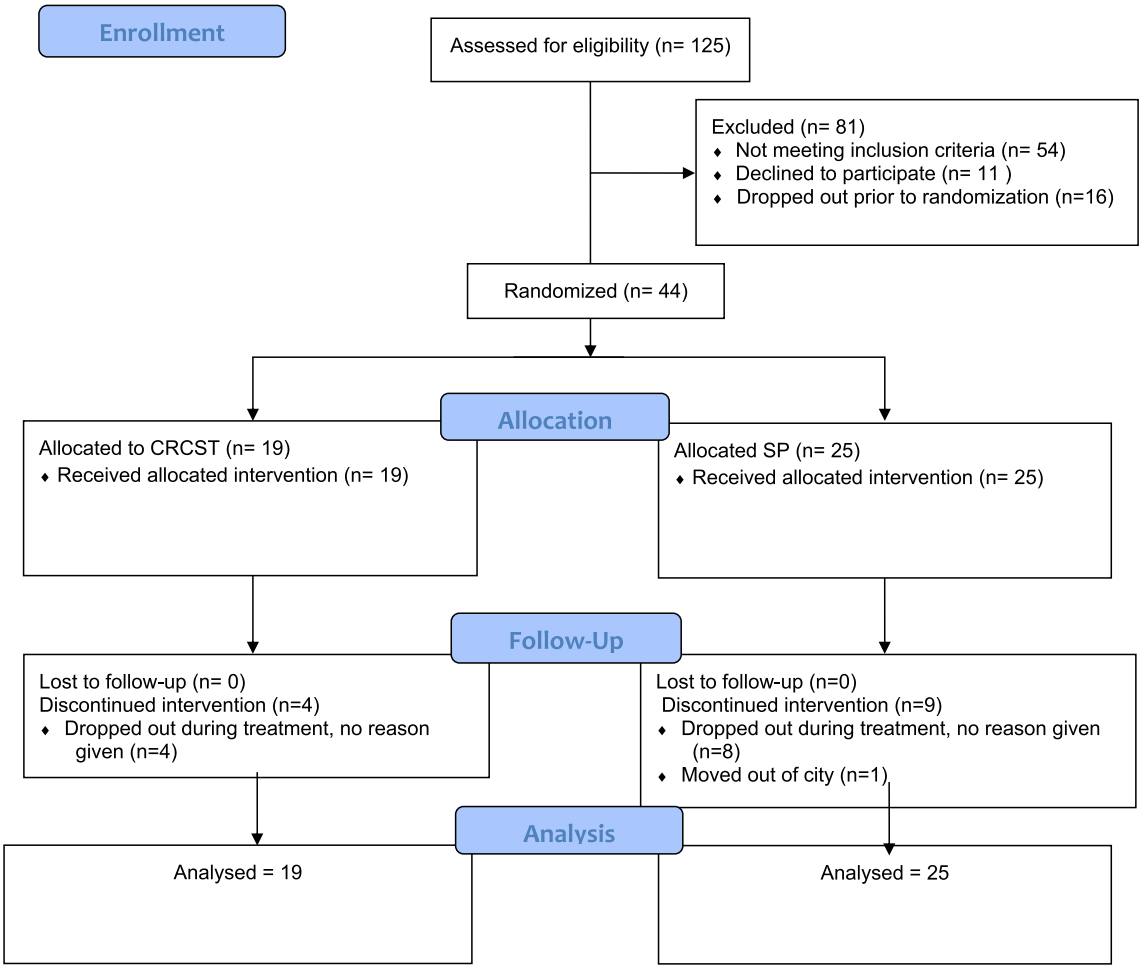

FIGURE 1 CONSORT Participant Flow Chart

Cognitive, Relaxation and Coping Skills Training for IED (CRCST)

CRCST was adapted from the manual by Deffenbacher and McKay (2000) to treat problems with general and specific anger. As described by McCloskey et al (2008), the CRCST for IED manual was extended from 8 to 12 sessions. The first three sessions focused on relaxation training, with the third session also incorporating the use of a "time-out." Sessions 4–5 focused on challenging anger distortions. Sessions 6–12 focused on increasingly provocative imaginal exposures, with the final few sessions also addressing relapse prevention.

Supportive Psychotherapy (SP)

SP for IED was adapted from a supportive psychotherapy manual designed to provide a highly credible nonspecific psychotherapy that represented the type of therapy outpatients might typically receive (Wilson et al., 1997), which it has been shown to do (Eisler et al., 1997). This treatment contained no active CBT ingredients such as relaxation training, cognitive restructuring, or imaginal exposure. The SP treatment uses client-centered techniques and focuses on rapport building, encouraging participants to explore underlying emotional problems, and facilitation of self-disclosure and the expression of those feelings. Revisions made to the supportive manual for use in this trial included increasing the number of sessions to 12 to dose equate it to CRCST-IED and changing the focus of the manual to aggression problems.

Treatment Adherence

CRCST and SP treatment adherence was assessed via a treatment adherence manual modeled after the Collaborative Study Psychotherapy Rating Scale (CSPRS) (Hill et al., 1992). In adapting the scale for this study, we used the 28-item CBT scale, 8-item facilitative condition (FC) scale, and 4-item explicit directedness (ED) scale, rewording items that focused on depression/depressogenic themes to instead focus on anger/aggression (e.g., "focus on pleasure and mastery" was replaced with "focus on anger coping thoughts"). Ten new items were also added, five to assess adherence to specific SP strategies (e.g., "facilitate self-disclosure"), and five to assess techniques proscribed from both SP and CRCST (e.g., "teach communication skills"). Unlike the CSPRS, the adherence manual for this study assessed items dichotomously. Violations of therapist adherence included omitting techniques/strategies essential to CRCST (e.g., recognizing cognitive errors) or SP (e.g., reflection) for the session assessed, as well as engaging in behaviors proscribed from SP (e.g., recognizing cognitive errors) and/or CRCST (e.g., teaching communication skills). Assessment of adherence was conducted by doctoral students with 2 or more years of psychotherapy experience and training on the CRCST and SP treatments. Five randomly selected sessions from each study therapist were viewed to assess treatment adherence. Treatment adherence was high for both CRCST (96%) and SP (100%) conditions.

RANDOMIZATION

Participants were randomly assigned to one of the two possible treatment conditions using a computer-generated randomization table. Treatment condition was assigned for each participant by the project coordinator when the participant was scheduled for their pretreatment (i.e., baseline) evaluation. This information was communicated to the research assistant and therapist. Participants were not informed of their treatment condition until they completed their baseline measures.

BASELINE INTERVIEW MEASURES

Participants completed both standardized clinical interview and self-report measures. Independent evaluators, blinded to treatment condition and trained in the conduct of interview protocols and other assessment measures, conducted all of the evaluations in this study.

Structured Clinical Interview for the DSM-IV (SCID; Spitzer et al., 1995) is a semistructured diagnostic clinical interview administered to diagnose DSM-IV non-IED syndromal disorders. The SCID has adequate interrater reliability with kappa values for modules reported to be between 0.70 and 1.00 (Spitzer et al., 1995).

Structured Interview for DSM-IV Personality (SID-P; Pfohl et al., 1995) was used to diagnose DSM-IV personality disorders. Estimates of interrater reliability for the SID-P are adequate with intraclass correlation coefficients as high as 0.88 to 0.99 (Damen et al., 2004).

Intermittent Explosive Disorder (IED) Interview (McCloskey & Coccaro, 2003) is a semistructured interview used to diagnose IED integrated research criteria (Coccaro, 2011), the precursor to current DSM-5 IED criteria. The IED interview obtains quantitative (e.g., frequency) and qualitative (e.g., description of most severe events) information for verbal and physical aggression, as well as aggression-related distress and impairment, and potential exclusionary information (e.g., aggressive acts occurring solely within the context of another psychological disor-

der or medical condition). Preliminary data suggest the IED interview is a valid and reliable (κ = 0.84) instrument (Kulper et al., 2015; McCloskey & Coccaro, 2003).

Life History of Aggression-Aggression Scale (LHA-A; Coccaro et al., 1998) is a five-item measure of lifetime aggression (temper tantrums, general fighting, specific physical assault, specific property assault, and verbal assault) frequency, with items scored 0 (*none*) to 5 (*more times than I can count*). The LHA-A has high internal consistency and good retest reliability (Coccaro et al, 1998), as well as predictive validity (McCloskey et al., 2006).

Global Assessment of Functioning (GAF; American Psychiatric Association, 2000) is a 0–100 score that reflects the extent to which psychological problems have impaired social and occupational functioning. Lower scores reflect greater impairment (Jones et al., 1995).

ANGER AND AGGRESSION OUTCOME MEASURES

Overt Aggression Scale-Modified (OAS-M; Coccaro et al., 1991) is the primary aggression measure. The OAS-M is a semistructured interview that assesses the frequency of aggressive behavior (i.e., verbal assault, assault against objects, and assault against others) over the past week. Within each aggression cluster, the OAS-M distinguishes five levels of severity that are weighted 1 (e.g., *snapped or yelled*) through 5 (e.g., *threatened to hit a stranger*). The OAS-M sums the frequency of the severity-weighted aggressive acts to derive a single composite aggression score. The OAS-M has demonstrated strong interrater reliability and validity (Coccaro, 2020). The OAS-M was administered by trained raters who were blind to participant condition.

State-Trait Anger Expression Inventory-2 (STAXI; Spielberger, 1999) is a 57-item self-report measure of anger expression and control that is commonly used in anger treatment research (Spielberger, 1999). Items are endorsed on a 1 (*not at all/almost never*) to 4 (*very much so/almost always*) scale. Five of the six primary STAXI-2 scales (all except trait anger) were used in the current study. The 15 items comprising the STAXI State Anger Scale, which measures current feelings of anger, were modified from saying "*right now*" to "*the past week*." This scale was used as our primary measure of anger. The 8-item STAXI Anger Expression-Out (STAXI-AXO) and Anger Expression-In (STAXI-AXI) scales measure how often angry feelings result in aggression (e.g., yelling, breaking things) and anger suppression (e.g., sit and "stew" over problem), respectively. The 8-item STAXI Anger Control-Out (STAXI-ACO) and Anger Control-In (STAXI-ACI) scales assess how often individuals attempt to reduce anger and express it constructively. The STAXI-2 has strong psychometric properties (Spielberger, 1999). In our sample, the internal consistency of the STAXI-2 state anger (α = 0.89) and anger expression/control scales (α = 0.73–.90) were acceptable.

Self-Report of Relational Aggression and Social Behavior (SRASB; Murray-Close et al., 2010) is a 14-item measure of reactive, proactive, and romantic relational aggression. Items assess relational aggressive behaviors which individuals endorse on a 0 (*never*) to 4 (*very often*) scale. The SRASB has good internal consistency, retest reliability and criterion validity, including participants with IED (vs other disorders) scoring higher on the SRASB (Murray-Close et al., 2010). In our sample, the internal consistency of the SRASB was acceptable (α = 0.88).

SOCIAL COGNITION MEASURES

Hostile Automatic Thoughts Questionnaire (HAT; Snyder et al., 1997) is a 30-item measure of automatic hostile cognitions and was used as an index of hostile, aggressive thinking. Specifically, individuals are instructed to describe how often they have thoughts associated with revenge, physical aggression, or the derogation of others "*in the past few days*" using a 5-point Likert scale ranging from "*not at all*" to "*all the time*." Snyder et al. (1997) found the HAT total score was internally consistent and showed evidence of convergent and discriminant validity. In our sample the internal consistency of the HAT was acceptable (α = 0.94).

Social Information Processing Questionnaire Attribution and Emotional Response Questionnaire (SIP-AEQ; Coccaro et al., 2009) consists of eight vignettes in which an unpleasant event occurs to the protagonist due to the actions of another. Participants are asked to rate the likelihood from 0 (*not at all*) to 3 (*very likely*) of explanations for the negative behavior that reflect hostile, instrumental, and benign intent. Participants then rate their level of negative affect if this negative event were to happen to them. The SIP-AEQ has good internal consistency (α = .76–.91) and convergent validity (Coccaro et al., 2009). For the current study, an index of benign (vs. hostile) attribution was calculated by subtracting hostile attribution scores from benign attribution scores. In our sample the internal consistency of benign attributions (α = 0.77), hostile attributions

(α = 0.77), and negative affect (α = 0.90) were acceptable.

OTHER MEASURES

Beck Depression Inventory II (BDI-II; Beck et al., 1996) is a 21-item self-report measure of depressive symptoms. Items are a graded series of self-evaluative statements ranging in severity from 0 to 3. The BDI-II has demonstrated good reliability and validity (Beck et al., 1996). In our sample, the internal consistency of the BDI-II was excellent (α = 0.93).

Beck Anxiety Inventory (BAI; Beck et al., 1988) is a 21-item Likert scale self-report measure of anxiety symptoms. The BAI has shown convergent validity (Osman et al., 1997) and good 5-week retest reliability (r = 0.83; de Beurs et al., 1997). In our sample, the internal consistency of the BAI was strong (α = 0.87).

Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q; Endicott et al., 1993) is a self-report measure of the enjoyment and satisfaction experienced over the past week in areas such as physical health/activities, feelings, work, leisure time activities, and social relations. Higher scores denote greater levels of satisfaction. We used the 15-item General Activities Summary scale, which showed high internal consistency (α = 0.90) as well as strong correlations with clinical global impression of disorder severity (r = −0.66) and global improvement (r = 0.50) among the Q-LES-Q scales (Endicott et al., 1993). In our sample, the internal consistency of the Q-LES-Q was strong (α = 0.94).

Working Alliance Inventory (WAI; Tracey & Kokotovic, 1989) is a 12-item self-report scale that assess convergence on goals, agreement on tasks, and the bond between therapist and client. The WAI has strong reliability (α = 0.71 to 0.96) and moderate predictive validity (Busseri & Tyler, 2003). In our sample, the internal consistency of the WAI was strong (α = 0.87).

PROCEDURE

Participants who completed an initial phone screen were scheduled for an on-site diagnostic screen to provide informed consent and assess study eligibility. Participants passing the diagnositic screen were scheduled for a full diagnostic evaluation to determine study eligibility and assess comorbid psychopathology. IED and other inclusion/exclusion diagnoses were confirmed using a best estimate procedure (Klein et al., 1994), in which a diagnostic report for each participant is presented and reviewed by a team of diagnosticians supervised by a licensed clinical psychologist to enhance the accuracy of diagnoses. The best estimate procedure yields strong interrater reliabilities in previous studies (kappa = .79–.93) across psychiatric diagnoses (Klein et al., 1994; Leckman et al., 1982).

Eligible participants returned for a third visit wherein they completed baseline questionnaires (STAXI-2, SRASB, HAT, SIP-AEQ, BDI-II, BAI and QLES-Q) and the OAS-M interview. They were then informed that they were randomized to either "cognitive-behavioral" (CRCST) or "emotion-focused client-centered" (SP) therapy. All outcome measures were given at posttreatment (13 weeks after baseline). Additionally, participants completed the OAS-M, STAXI-2, SRASB, and HAT at midtreatment (7 weeks after baseline) to explore the time course of potential treatment effects. The WAI was completed before Session 4 and at the end of treatment. Participants returned at 3-month follow-up to complete all outcome measures.

DATA ANALYSIS

Analyses were conducted two-tailed at the 0.05 level of significance. Non-normally distributed data were transformed. Specifically, the OAS-M, SRASB, HAT, BDI-II and BAI all had skew values at least three times its standard error during at least one time point. After natural log transformation, skew was reduced to acceptable levels for all of these variables.

Participants with any outcome assessments were included in the analysis (intent-to-treat analysis). Missing data were determined to be missing at random. Linear effects mixed model (LMM) analyses provide robust estimates when data are missing at random (Little & Rubin, 2014). LMM was conducted using SPSS 28 (IBM Corp., 2021) with maximum likelihood model estimation. These mixed models included main effects for time (baseline = 0, midtreatment [when applicable] = 1, posttreatment = 2, and 3-month follow-up = 3) for all outcomes, treatment group (SP = 0, CRCST = 1), and a time-by-treatment group interaction, which was used to assess the effectiveness of the intervention. In the linear mixed models, the time-by-treatment interaction term represents the trajectory of change across time for the CRCST group as compared to the SP group. Models included a random intercept and slope, as well as the association between the random intercept and slope. We calculated estimates, confidence intervals, and effect sizes (Cohen's d) for time, treatment, and time-by-treatment interaction. As this study was focused on the relative effects of the two treatments over time, this paper focuses

on the treatment-by-time interaction. When there was a significant treatment-by-time interaction, separate model-based interaction estimates over the relevant timeframes were made to compare interventions from baseline to midtreatment (when applicable), end of treatment, and 3-month follow-up. The full mixed models were also rerun with CRCST as the reference group (CRCST = 0, SP =1) to get the time slope for CRCST.

Results

BASELINE CHARACTERISTICS

Independent *t*-tests (Age, GAF, LHA-A) and chi-square analyses (all other variables) compared the CRCST and SP groups on demographic and clinical characteristics at baseline (pretreatment). As Table 1 shows, the groups did not differ on any baseline demographic or clinical characteristics including history of aggressive behavior (all $p > 0.10$). Across treatment groups, IED subjects showed considerable comorbidity with Axis I and Axis II psychopathology and moderate psychosocial impairment. Among the outcome variables, participants in the SP condition had higher baseline anger expression out and lower anger control out. However, they did not differ on any other aggression, social information processing, or other outcome measures.

ATTRITION AND NUMBER OF SESSIONS ATTENDED

Attrition was moderate with 4 of the 19 participants (21%) in the CRCST condition and 9 of the 25 (36%) participants in the SP condition dropping out of the study before the end of treatment. Chi-square analyses revealed no effect of condition for attrition rate, χ^2 (1, $N = 44$) = 1.16, $p = .28$. Among those who did not drop out, there was no difference in number of sessions attended for CRCST ($M = 11.33$, $SD = 0.73$) and SP ($M = 10.68$, $SD = 1.44$), t (31) = 1.55, $p = .13$.

AGGRESSION AND ANGER (SEE TABLES 2 AND 3)

Aggression

Aggressive behavior (i.e., OAS-M aggression score) was our primary outcome measure. CRCST and SP conditions did not differ in aggression at baseline ($B = -.06$ [CI = −0.43 to 0.42], $t = -0.23$, $p = .817$). Estimates showed a significant effect of time for both SP and CRCST as well as a time-by-treatment interaction. Table 3 shows the results of the time-by-treatment interactions, as well as the simple effect of time for each condition. The CRCST group showed steeper decreases in OAS-M aggression than the SP group from baseline to midtreatment ($B = -1.48$ [CI = −2.33 to −0.54], $t = -3.27$, $p = .003$), posttreatment ($B = -0.63$ [CI = −1.08 to −0.19], $t = -2.88$, $p = .007$), and 3-month follow-up ($B = -0.34$ [CI = −0.064 to −0.04], $t = -2.33$, $p = .027$).

Consistent with McCloskey et al (2008), IED remission was operationally defined as no verbal or physical aggression on the posttreatment OAS-M. Using this criteria, eight CRCST participants (42%) and two SP participants (8%) were remitted at the end of treatment. Fishers exact

Table 1
Demographic and Baseline Characteristics of Participants ($N = 44$)

	CRCST ($N = 19$)	SP ($N = 25$)	t/χ^2
Sex: *n* (% male)	10 (52.63)	12 (48.00)	0.09
Race: *n* (% white)	9 (47.37)	16 (64.00)	1.91
Never married: *n* (%)	10 (52.63)	12 (48.00)	1.82
College graduate: *n* (%)	10 (52.63)	11(44.00)	0.32
Any current Axis I Dx: *n* (%)	10 (52.63)	14 (56.00)	0.05
Any lifetime Axis I Dx: *n* (%)	16 (84.21)	22 (88.00)	0.13
Any lifetime Mood Dx: *n* (%)	11(57.89)	16 (64.00)	0.17
Any lifetime Anxiety Dx: *n* (%)	9 (47.37)	11 (44.00)	0.05
Any lifetime Sub Dx: *n* (%)	11 (57.89)	12 (48.00)	0.42
Any Axis II Dx: *n* (%)	15 (78.95)	20 (80.00)	0.01
Any cluster B PD: *n* (%)	4 (21.05)	9 (36.00)	1.16
Age: *M* (*SD*)	36.84 (12.06)	36.48 (9.56)	0.11
Current GAF: *M* (*SD*)	54.68 (5.95)	52.96 (4.64)	1.08
LHA – Aggression Scale: *M* (*SD*)	17.61 (3.97)	18.04 (2.72)	0.42

Note. CRCST = Cognitive Restructuring, Relaxation, and Coping Skills Training for IED; SP = Supportive Psychotherapy; Dx = Disorder; Anx = Anxiety; Sub = Substance Use (abuse or dependence); PD = Personality Disorder; GAF = Global Assessment of Functioning; LHA – Life History of Aggression.

Table 2
Estimated Mean (SE) Aggression and Anger Score as a Function of Time and Treatment ($N = 44$)

	Baseline		Mid-Treatment		Posttreatment		3 Month F/U	
	CRCST	SP	CRCST	SP	CRCST	SP	CRCST	SP
OAS-M	3.00 (0.18)	3.05(0.16)	2.34(0.17)	2.79(0.15)	1.64(0.21)	2.52(0.19)	0.98(0.27)	2.28(0.25)
SRASB	2.65 (0.15)	2.72(0.12)	2.44(0.15)	2.65(0.13)	2.23(0.16)	2.58(0.14)	1.99(0.16)	2.51(0.16)
STAXI-SAS	28.67 (1.36)	32.32 (1.19)	25.53(1.32)	30.53(1.19)	22.51(1.64)	28.89(1.51)	19.59(2.11)	27.41(1.93)
STAXI-AXO	18.67 (0.82)	22.09(0.72)	17.01(0.71)	21.35(0.64)	15.35(0.76)	20.61(0.69)	13.66(0.93)	19.86(0.84)
STAXI-AXI	18.23 (0.90)	18.24(0.79)	17.02(0.74)	17.57(0.66)	15.83(0.67)	16.91(0.60)	14.58(0.73)	16.24(0.66)
STAXI-ACO	19.00 (0.86)	16.37(0.75)	21.49(0.80)	17.17 (0.71)	23.98(0.91)	17.97(0.82)	26.41(1.14)	18.77(1.04)
STAXI-ACI	19.97 (1.04)	17.50(0.91)	22.94(0.93)	17.96(0.82)	25.90(1.02)	18.43(0.92)	28.86(1.26)	18.89(1.16)

Note. CRCST = Cognitive Restructuring, Relaxation, and Coping Skills Training for IED; SP = Supportive Psychotherapy; OAS-M = Overt Aggression Scale – Modified (natural log); SRASB = Self-Report of Relational Aggression and Social Behavior (natural log); STAXI = State-Trait Anger Expression Inventory -2; SAS = State (past week) Anger Scale; AXO = Anger Expression Out; AXI = Anger Expression In; ACO = Anger Control Out; ACI = Anger Control In.

probability tests showed that CRCST had a higher remission rate than SP ($p = .01$).

CRCST and SP conditions did not differ on relational aggression (SRASB) at baseline ($B = -.10$ [CI = −0.49 to 0.29], $t = -0.52$, $p = .607$). Estimates showed a significant effect of time for CRCST as well as a time-by-treatment interaction. The CRCST group showed a steeper decrease in relational aggression than the SP group from baseline to 3-month follow-up ($B = -0.19$ [CI = −0.35 to −0.04], $t = -2.40$, $p = .017$), but not from baseline to mid-treatment ($B = -0.10$ [CI = −0.41 to 0.21], $t = -0.65$, $p = .521$) or posttreatment ($B = -0.16$ [CI = −0.34 to 0.01], $t = -1.82$, $p = .075$).

Anger

Those in the SP condition were nonsignificantly higher at baseline on STAXI state (past week) anger than those in the CRCST condition ($B = -3.56$ [CI = −7.20 to 0.08], $t = -1.98$, $p = .055$). Estimates showed a significant effect of time on STAXI state anger for both SP and CRCST with no time-by-treatment interaction.

Anger Expression

For the STAXI-AXO, the SP condition was higher than the CRCST condition at baseline ($B = -3.43$ [CI = −5.63 to −1.12], $t = -3.14$, $p = .003$). Estimates showed a significant effect of time for both SP and CRCST conditions as well as a time-by-treatment interaction. CRCST participants showed steeper decreases in STAXI-AXO than the SP participants from baseline to midtreatment ($B = -2.87$ [CI = −5.61 to −0.13], $t = -2.12$, $p = .041$), posttreatment ($B = -1.80$ [CI = −3.30 to −0.39], $t = -2.60$, $p = .014$), and 3-month follow-up ($B = -1.00$ [CI = −1.96 to −0.03], $t = -2.02$, $p = .041$).

SP and CRCST participants did not differ on the STAXI-AXI at baseline ($B = -.01$ [CI = −2.43 to 2.42], $t = -0.03$, $p = .997$). Estimates showed a significant time effect on STAXI-AXI for both SP and CRCST conditions with no time-by-treatment interaction.

Anger Control

Participants in the SP condition reported lower STAXI-ACO than CRCST participants at baseline ($B = 2.63$ [CI = 0.33 to 4.93], $t = 2.30$, $p = .026$). Estimates showed a significant effect of time for both SP and CRCST participants as well as a time-by-treatment interaction. CRCST and SP did not differ in slope from baseline to midtreatment ($B = 1.66$ [CI = −0.91 to 4.23], $t = 1.31$, $p = .198$. However, CRCST participants showed steeper increases in STAXI-ACO than the SP participants from baseline to posttreatment ($B = 1.68$ [CI = 0.40 to 2.95], $t = 2.66$, $p = .011$) and 3-month follow-up ($B = 2.00$ [CI = 0.81 to 3.19], $t = 3.45$, $p = .002$).

Participants in the CRCST and SP conditions did not differ on STAXI-ACI at baseline ($B = 2.48$ [CI = −0.32 to 5.27], $t = -1.78$, $p = .081$). Estimates showed a significant effect of time for CRCST as well as a time-by-treatment interaction. CRCST participants showed steeper increases in STAXI-ACI than the SP participants from baseline to midtreatment ($B = 4.58$ [CI = 2.14 to 7.03], $t = 3.81$, $p < .001$), posttreatment ($B = 3.24$ [CI = 1.75 to 4.73], $t = 4.28$, $p < .001$), and 3-month follow-up ($B = 2.51$ [CI = 1.25 to 3.77], $t = 4.10$, $p < .001$).

SOCIAL COGNITION (SEE TABLES 4 AND 5)

CRCST and SP participants did not differ on hostile automatic thoughts at baseline ($B = -.15$ [CI = −785.46 to 785.46], $t = -1.87$, $p = .632$). Estimates showed a significant effect of time on HAT scores for both SP and CRCST with no time-by-treatment interaction. Table 5 shows the

Table 3
Aggression and Anger Measure Estimates as a Function of Time × Treatment ($N = 44$)

	Time x Treatment				Time (CRCST)				Time (SP)			
	B [95% CI]	*t*	*p*	*d*	*B* [95% CI]	*t*	*p*	*d*	*B* [95% CI]	*t*	*p*	*d*
OAS-M	−0.44 [−0.75 to −0.13]	−2.82	.006	−0.61	−0.72 [−0.95 to −0.49]	−6.15	.001	−1.32	−0.27 [−0.48 to −0.07]	−2.64	.010	−0.58
SRASB	−0.19 [−0.34 to −0.04]	−2.14	.041	−0.81	−0.21 [−0.30 to −0.11]	−4.32	.001	−1.64	−0.03 [−0.13 to 0.08]	−1.50	.144	−0.57
STAXI-SAS	−1.33 [−3.52 to 0.86]	−1.21	.230	−0.27	−2.93 [−4.59 to −1.35]	−3.65	.001	−0.80	−1.64 [−3.12 to 0.17]	−2.22	.030	−0.50
STAXI-AXO	−0.92 [−1.84 to −0.01]	−2.02	.049	−0.56	−1.22 [−1.80 to −0.63]	−4.88	.001	−1.33	−0.74 [−1.35 to −0.13]	−2.43	.019	−0.68
STAXI-AXI	−0.55 [−1.34 to 0.23]	−1.43	.161	−0.48	−1.66 [−2.35 to −0.98]	−4.22	.001	−1.42	−0.66 [−1.18 to −0.14]	−2.59	.014	−0.87
STAXI-ACO	1.69 [0.67 to 2.72]	3.32	.002	0.96	2.49 [1.73 to 3.25]	6.61	.001	1.91	0.80 [0.11 to 1.49]	2.33	.024	0.68
STAXI-ACI	2.50 [1.28 to 3.72]	4.17	.001	1.48	2.96 [2.06 to 3.87]	6.66	.001	2.36	0.47 [−0.35 to 1.28]	1.16	.256	0.42

Note. SP = Supportive Psychotherapy; CRCST = Cognitive Restructuring, Relaxation, and Coping Skills Training for IED; OAS-M = Overt Aggression Scale – Modified (natural log);

results of the time-by-treatment interactions, as well as the simple effect of time for each treatment.

CRCST and SP participants did not differ on the SIP-AEQ benign-hostile attribution index at baseline ($B = 1.46$ [CI = −1.69 to 4.53], $t = 0.95$, $p = .349$). Estimates showed a significant increase in benign (vs. hostile) attributions for CRCST participants but not for SP participants. However, there was no time-by-treatment interaction. CRCST and SP groups did not differ on SIP-AEQ negative affect at baseline ($B = -3.87$ [CI = −8.71 to 0.97], $t = -1.61$, $p = .114$). Estimates showed a significant decrease in negative affect on the SIP-AEQ over time for CRCST but not for SP. However, the time-by-treatment interaction was only a nonsignificant trend ($p < .07$).

TREATMENT EFFECT ON NONTARGETED MEASURES (SEE TABLES 4 AND 5)

Depressive Symptoms

CRCST and SP conditions did not differ from each other on the BDI-II at baseline ($B = -.09$ [CI = −0.59 to 0.42], $t = -0.35$, $p = .725$). Estimates showed a significant decrease in BDI-II scores over time for CRCST participants, but not for SP participants. However, there was no time-by-treatment interaction.

Anxiety

CRCST and SP conditions did not differ from each other on the BAI at baseline ($B = -.09$ [CI = −0.22 to 0.04], $t = -1.40$, $p = .169$). Estimates showed a significant decrease in BAI scores over time for CRCST participants but not for SP participants. However, there was no time-by-treatment interaction.

Quality of Life

CRCST and SP conditions did not differ on the QLESQ at baseline ($B = 1.29$ [CI = −4.17 to 6.76], $t = 0.48$, $p = .636$). Estimates showed no effect of time for either CRCST or SP participants, nor a time-by-treatment interaction.

WORKING ALLIANCE (SEE TABLE 6)

Among participants who completed the treatment, client ratings of the WAI scales were higher for CRCST relative to SP for both tasks and goals. This was true both at Week 4 and after Week 12. Participants in the CRCST and SP conditions did not differ in their ratings of the bond between therapist and client at either time point. Exploratory analyses showed the same pattern of group differences at Week 4 when including participants who later dropped out of the study. Furthermore, participants who dropped out did not differ on

Table 4
Estimated Mean (SE) Social Cognition and Nontargeted Measures as a Function of Time and Treatment ($N = 44$)

	Baseline		Mid-Treatment		Posttreatment		3 Month F/U	
	CRCST	SP	CRCST	SP	CRCST	SP	CRCST	SP
HAT	4.01 (0.06)	4.16(0.05)	3.90(0.05)	4.09(0.04)	3.79(0.05)	4.02(0.04)	3.69(0.05)	3.96(0.05)
SIP-BHAI*	4.85 (1.16)	3.39(1.02)	–	–	7.51(1.13)	4.61(1.00)	9.16(1.35)	5.09(1.21)
SIP-NAT	25.24 (1.81)	29.11 (1.58)	–	–	19.75(1.64)	27.21(1.50)	16.99(2.04)	26.28(1.89)
BDI-II	2.31 (0.19)	2.39(0.17)	–	–	1.81(0.18)	2.14(0.97)	1.57(0.24)	2.01(0.22)
BAI	3.38(0.05)	3.48(0.04)	–	–	3.30(0.04)	3.44(0.04)	3.26(0.05)	3.43(0.04)
QLESQ	40.58 (2.05)	39.28 (1.79)	–	–	42.91 (2.03)	40.06 (1.77)	43.98 (2.19)	40.35 (1.91)

Note. CRCST = Cognitive Restructuring, Relaxation, and Coping Skills Training for IED; SP = Supportive Psychotherapy; HAT= Hostile Automatic Thoughts Questionnaire (natural log); SIP Social Information Processing Attribution and Emotional Response Questionnaire; BHAI =Benign vs Hostile Attribution Index; NAT = Negative Affect Total; BDI-II = Beck Depression Inventory – II (natural log); BAI = Beck Anxiety Inventory (natural log); QLESQ = Quality of Life Enjoyment and Satisfaction Questionnaire.
* Higher scores suggest more benign relative to hostile attributions.

any WAI scale at Week 4 from those who completed the active phase of the study (all $p > .20$).

Discussion

The goal of this study was to assess the efficacy of a multicomponent CBT intervention (CRCST) compared to nonspecific supportive psychotherapy (SP) for reducing aggression, anger, and associated constructs among individuals with IED. CRCST was superior to SP in reducing aggressive behavior, though not anger. Our results also largely support the efficacy of CBT in decreasing relational aggression and anger expression while increasing anger control. In contrast, CBT was not superior to SP in reducing hostile biases, anxiety, or depression. This is the first RCT to demonstrate that CBT is superior to a psychotherapy control in decreasing aggression in IED.

Though participants in both treatment conditions decreased in aggression (a primary outcome) from baseline to posttreatment and follow-up, those in the CRCST condition showed a greater reduction in aggression at midtreatment, posttreatment, and follow-up. This improvement was also reflected in the greater proportion of individuals in the CRCST (vs. SP) condition who met remission criteria at the end of treatment. These results support and extend previous research showing that CBT may be efficacious in treating IED (McCloskey et al., 2008). Furthermore, though CRCST does not directly focus on relational aggression, CRCST outperformed SP in decreasing relational aggression, suggesting the aggression-reducing effects of CRCST may generalize to forms of aggression not previously assessed in treatment studies of IED.

CRCST's effects on anger (a primary outcome) and internal expression of anger (e.g., rumination) were somewhat more limited. Participants in both treatment conditions showed decreased anger and internal anger expression over time, but the two treatments conditions did not differ from each other in their rate of change. This may reflect the tendency for CRCST to have stronger effects on aggression than angry feelings (McCloskey et al., 2008), as well as the efficacy of more process-oriented psychotherapies in decreasing anger (Deffenbacher et al., 1990).

Participants in both treatment conditions demonstrated significant decreases in self-reported external behavioral expressions of anger (i.e., aggression), and increases in use of strategies to control these external expressions of anger. However, these changes were greater for those in the CRCST condition. These findings are consistent with previous treatment studies showing CBT decreases anger expression-out and improves anger control-out among individuals with IED (Costa et al., 2018; Hewage et al., 2018; McCloskey et al., 2008).

CRCST also outperformed SP in increasing use of strategies to control internal expressions of anger, with only the CRCST condition showing significant improvements in STAXI anger control-in over time. CRCST's superiority over SP in increasing use of control strategies for these internal expressions of anger may reflect generalization of the use of relaxation and cognitive restructuring that is at the core of CRCST.

Though participants in the CRCST condition showed decreased hostile automatic thoughts, reduced perceived negative affect in response to an unpleasant event and (at posttreatment) increased benign attributions over the course of treatment, this was not superior to SP. This was somewhat surprising as modifying cognitions is a mechanism through which CBT is designed to facilitate change. However, as noted, the participants in the CRCST condition did show significant and large changes over time on these measures. It

Table 5
Social Cognition and Nontargeted Measures as a Function of Time × Treatment ($N = 44$)

	Time x Treatment				Time (CRCST)				Time (SP)			
	B [95% CI]	*t*	*p*	*d*	B [95% CI]	*t*	*p*	*d*	B [95% CI]	*t*	*p*	*d*
HAT	−0.04 [−0.10 to 0.25]	−1.24	.222	−0.36	−0.11 [−0.16 to −0.06]	−4.59	.001	−2.25	−0.07 [−0.12 to −0.03]	−3.28	.002	−1.09
SIP-BHAI	0.70 [−0.38 to 1.79]	1.31	.199	0.42	1.30 [0.48 to 2.11]	3.22	.003	1.01	0.60 [−0.11 to 1.31]	1.72	.094	0.56
SIP-NAT	−1.83 [−3.81 to 0.15]	−1.84	.069	−0.45	−2.73 [−4.21 to −1.25]	−3.68	.001	−0.90	−0.90 [−2.22 to 0.42]	−1.37	.176	−0.33
BDI-II	−0.12 [−0.38 to 0.14]	−0.92	.366	−0.34	−0.25 [−0.44 to −0.05]	−2.61	.014	−0.97	−0.13 [−0.30 to 0.04]	−1.53	.137	−0.57
BAI	−0.03 [−0.07 to 0.02]	−1.18	.247	−0.39	−0.04 [−0.08 to −0.01]	−2.60	.013	−0.85	−0.02 [−0.05 to 0.01]	−1.16	.253	−0.38
QLESQ	0.78 [−1.26 to 2.82]	0.76	.448	0.18	1.14 [−0.40 to 2.67]	1.48	.144	0.36	0.36 [−0.98 to 1.70]	0.54	.594	0.13

Note. CRCST = Cognitive Restructuring, Relaxation, and Coping Skills Training for IED; SP = Supportive Psychotherapy; HAT= Hostile Automatic Thoughts Questionnaire (natural log); SIP= Social Information Processing Attribution and Emotional Response Questionnaire; BHAI =Benign vs Hostile Attribution Index; NAT = Negative Affect Total; BDI-II = Beck Depression Inventory – II (natural log); BAI = Beck Anxiety Inventory (natural log); QLESQ = Quality of Life Enjoyment and Satisfaction Questionnaire.

is possible that reducing hostile thoughts is a part of all successful treatments for IED and results from general psychotherapy factors. This is supported somewhat by the significant reduction in hostile automatic thoughts as well as the moderate, albeit nonsignificant, reduction in hostile bias over treatment for participants in the SP condition. It is also possible that the limited sample size obfuscated the superiority of CBT in reducing hostile cognitions, as the interaction effects were in the low end of the moderate range. These explanations are not mutually exclusive, and both of these factors may have played a role in the lack of a significant effect of treatment over time for hostile cognitions.

Likewise, though those in the CRCST (but not SP) condition showed decreased current depressive symptoms and anxiety levels over the course of treatment and follow-up, the two conditions did not significantly differ. Thus, CRCST may have a positive effect on mood, albeit not necessarily a greater effect than other treatments would. This may be of particular importance for IED, which has a high level of comorbidity with mood and anxiety disorders (Coccaro, 2019). The finding that individuals in the CRCST condition showed decreased anxiety contrasts the previous CRCST study in IED (McCloskey et al., 2008), which found no such anxiolytic effect. In response to that earlier finding, a portion of the 10th CRCST session in the current study was devoted to identifying the association between anger/aggression, anxiety, and depression. This may have contributed to the decrease in anxiety in the current study. However, again it must be noted that CRCST was not superior to SP. Thus, any decreases in negative mood could be due to nonspecific therapy factors, regression to the mean, or even the simple passage of time, though the findings of McCloskey et al. (2008) argue somewhat against this latter interpretation.

Neither condition showed significant improvements in quality of life. This was surprising considering both past research (McCloskey et al., 2008) and the current study findings of reduced aggression, anger, and negative affect over time. IED is associated with greater functional impairment and a poorer quality of life even compared to other psychiatric conditions (Rynar & Coccaro, 2018). Thus, the improvement in symptoms may not have been sufficient to significantly alter longstanding interpersonal and other problems, at least not over the course of treatment. A somewhat related possibility is that if improvements have occurred in quality of life, participants may be slow to recognize them. However, neither of these suppositions

Table 6
Mean (SD) Working Alliance Inventory Scale Scores as a Function of Treatment

	Week 4			Week 12		
	CRCST	SP	*t*	CRCST	SP	*t*
Subject						
Goals	24.86 (3.24)	21.18 (3.88)	2.81**	25.78 (1.62)	22.40 (3.66)	3.25**
Task	24.06 (3.30)	19.93 (4.15)	3.05**	24.71 (2.39)	21.06 (6.02)	2.14*
Bond	24.42 (3.61)	22.12 (4.70)	1.51	25.42 (2.65)	23.80 (3.78)	1.33

Note. CRCST = Cognitive Restructuring, Relaxation, and Coping Skills Training for IED; SP = Supportive Psychotherapy
* $p < .05$.
** $p < .01$

fully explain the discrepancy between the current findings and the earlier (McCloskey et al., 2008) CRCST study.

Dropout rates ranged from 21% (CRCST) to 36% (SP). Though comparable with other treatment studies of IED (Costa et al., 2018), this rate was higher than the very low (0%–13%) dropout rate for CRCST in the McCloskey et al. (2008) study. One possible reason for this discrepancy is that in the McCloskey et al. (2008) study, all therapists were licensed clinical psychologists working in an aggression research clinic. The current study used master's-level therapists with less specialized experience working with IED patients. As such, it is likely the dropout rates in the current study may better reflect dropout in more real-world treatment of IED.

Study limitations included the modest sample size, which may have obfuscated group differences. Relatedly, as the study was somewhat underpowered, we chose not to adjust for family-wise error for our secondary study variables, increasing the possibility of a false positive finding. The limited sample size also resulted in randomization not fully equating treatment groups on all secondary baseline measures. Larger clinical trials will be needed to replicate or clarify the current study's findings. Treatment adherence was formally assessed to ensure treatments were delivered as designed. However, the use of dichotomous scoring may have limited the ability to identify less severe deviations from adherence. Further, adherence ratings were conducted by only one assessor, preventing an assessment of interrater reliability. Finally, the author (MM) conducted training on both treatments, which may have introduced some bias/allegiance effect into the study. Future studies would benefit from greater independence between the PI and the comparison treatment, as well as a more thorough assessment of adherence using standardized measures and multiple adherence ratings of sessions.

Despite these limitations, this study makes an important contribution to the literature as it is the first known RCT of a psychosocial intervention for IED to compare a cognitive-behavioral therapy intervention with a psychotherapy control. The findings support the efficacy of cognitive-behavioral interventions specifically in reducing aggression in IED. Larger clinical trials by other research groups are clearly needed, but the current finding adds to slowly growing support for the efficacy of CBT in treating IED.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

References

Allen, J. J., & Anderson, C. A. (2017). Aggression and violence: Definitions and distinctions. In P. Sturmey (Ed.), *Wiley handbook of violence and Aggression*. John Wiley & Sons.

American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Author.

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Author.

Bácskai, E., Czobor, P., & Gerevich, J. (2011). Gender differences in trait aggression in young adults with drug and alcohol dependence compared to the general population. *Progress in Neuro-Psychopharmacology & Biological Psychiatry, 35*(5), 1333–1340.

Barth, J., Munder, T., Gerger, H., Nuesch, E., Trelle, S., Znoj, H., ... Cuijpers, P. (2013). Comparative efficacy of seven psychotherapeutic interventions for patients with depression: A network meta-analysis. *PLoS Medicine, 10*(5), e1001454.

Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology, 56*(6), 893–897.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for Beck Depression Inventory-II*. Psychological Corporation.

Busseri, M. A., & Tyler, J. D. (2003). Interchangeability of the Working Alliance Inventory and Working Alliance Inventory, Short Form. *Psychological Assessment, 15*(2), 193–197.

Coccaro, E. F. (2011). Intermittent explosive disorder: Development of integrated research criteria for Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. *Comparative Psychiatry, 52*(2), 119–125.

Coccaro, E. F. (2019). Psychiatric comorbidity in Intermittent Explosive Disorder. *Journal of Psychiatric Research, 118*, 38–43.

Coccaro, E. F. (2020). The Overt Aggression Scale Modified (OAS-M) for clinical trials targeting impulsive aggression and intermittent explosive disorder: Validity, reliability, and correlates. *Journal of Psychiatric Research, 124*, 50–57.

Coccaro, E. F., Harvey, P. D., Kupsaw-Lawrence, E., Herbert, J. L., & Bernstein, D. P. (1991). Development of neuropharmacologically based behavioral assessments of impulsive aggressive behavior. *Journal of Neuropsychiatry and Clinical Neurosciences, 3*(2), S44–S51.

Coccaro, E. F., Kavoussi, R. J., Berman, M. E., & Lish, J. D. (1998). Intermittent explosive disorder-revised: Development, reliability, and validity of research criteria. *Comprehensive Psychiatry, 39*(6), 368–376.

Coccaro, E. F., Kavoussi, R. J., & Hauger, R. L. (1997). Serotonin function and antiaggressive response to fluoxetine: A pilot study. *Biological Psychiatry, 42*(7), 546–552.

Coccaro, E. F., & McCloskey, M. S. (2019). Phenomenology of Impulsive Aggression and Intermittent Explosive Disorder. In E. F. Coccaro & M. S. McCloskey (Eds.), *Intermittent Explosive Disorder: Etiology, Assessment, and Treatment*. Academic Press.

Coccaro, E. F., Noblett, K. L., & McCloskey, M. S. (2009). Attributional and emotional responses to socially ambiguous cues: Validation of a new assessment of social/emotional information processing in healthy adults and impulsive aggressive patients. *Journal of Psychiatric Research, 43*(10), 915–925.

Corso, P. S., Mercy, J. A., Simon, T. R., Finkelstein, E. A., & Miller, T. R. (2007). Medical costs and productivity losses due to interpersonal and self-directed violence in the United States. *American Journal of Preventative Medicine, 32*(6), 474–482.

Costa, A. M., Medeiros, G. C., Redden, S., Grant, J. E., Tavares, H., & Seger, L. (2018). Cognitive-behavioral group therapy for intermittent explosive disorder: Description and preliminary analysis. *Revista Brasileira de Psiquiatria, 40*(3), 316–319.

Damen, K. F., De Jong, C. A., & Van der Kroft, P. J. (2004). Interrater reliability of the structured interview for DSM-IV personality in an opioid-dependent patient sample. *European Addiction Research, 10*(3), 99–104.

de Beurs, E., Wilson, K. A., Chambless, D. L., Goldstein, A. J., & Feske, U. (1997). Convergent and divergent validity of the Beck Anxiety Inventory for patients with panic disorder and agoraphobia. *Depression and Anxiety, 6*(4), 140–146.

Deffenbacher, J. L., & Mckay, M. (2000). *Overcoming Situational and General Anger*. New Harbinger Publications.

Deffenbacher, J. L., Mcnabb, K., Stark, R. S., & Sabadell, P. M. (1990). comparison of cognitive-behavioral and process-oriented group counseling for general anger reduction. *Journal of Counseling and Development, 69*, 167–172.

Eisler, I., Dare, C., Russell, G. M., Szmukler, G., le Grange, D., & Dodge, E. (1997). Family and individual therapy in anorexia nervosa: A 5-year follow-up. *Archives of General Psychiatry, 54*(11), 1025–1030.

Endicott, J., Nee, J., Harrison, W., & Blumenthal, R. (1993). Quality of Life Enjoyment and Satisfaction Questionnaire: A new measure. *Psychopharmacology Bulletin, 29*(2), 321–326.

Galovski, T., & Blanchard, E. B. (2002). The effectiveness of a brief psychological intervention on court-referred and self-referred aggressive drivers. *Behaviour Research and Therapy, 40*(12), 1385–1402.

Hewage, K., Steel, Z., Mohsin, M., Tay, A. K., De Oliveira, J. C., Da Piedade, M., ... Silove, D. (2018). A wait-list controlled study of a trauma-focused cognitive behavioral treatment for intermittent explosive disorder in Timor-Leste. *The American Journal of Orthopsychiatry, 88*(3), 282–294.

Hill, C. E., O'Grady, K. E., & Elkin, I. (1992). Applying the Collaborative Study Psychotherapy Rating Scale to rate therapist adherence in CBT, interpersonal therapy, and clinical management. *Journal of Consulting and Clinical Psychology, 60*, 73–79.

IBM Corp. Released (2021). *SPSS Statistics for Windows, Version 28.0*. Armonk, NY: IBM Corp.

Jones, S. H., Thornicroft, G., Coffey, M., & Dunn, G. (1995). A brief mental health outcome scale-reliability and validity of the Global Assessment of Functioning (GAF). *The British Journal of Psychiatry: The Journal of Mental Science, 166*(5), 654–659.

Klein, D. N., Ouimette, P. C., Kelly, H. S., Ferro, T., & Riso, L. P. (1994). Test-retest reliability of team consensus best-estimate diagnoses of axis I and II disorders in a family study. *American Journal of Psychiatry, 151*(7), 1043–1047.

Kulper, D. A., Kleiman, E. M., McCloskey, M. S., Berman, M. E., & Coccaro, E. F. (2015). The experience of aggressive outbursts in Intermittent Explosive Disorder. *Psychiatry Research, 225*(3), 710–715.

Leckman, J. F., Sholomskas, D., Thompson, W. D., Belanger, A., & Weissman, M. M. (1982). Best estimate of lifetime psychiatric diagnosis: A methodological study. *Archives of General Psychiatry, 39*(8), 879–883.

Little, R. J., & Rubin, D. B. (2014). *Statistical analysis with missing data* (2nd ed.). John Wiley & Sons.

Liu, Q., & Cole, D. A. (2021). Aggressive outbursts among adults with major depressive disorder: Results from the Collaborative Psychiatric Epidemiological Surveys. *Journal of Psychiatric Research, 135*, 325–331.

Mattes, J. A. (2008). Levetiracetam in patients with impulsive aggression: A double-blind, placebo-controlled trial. *The Journal of Clinical Psychiatry, 69*(2), 310–315.

McCloskey, M. S., Berman, M. E., Noblett, K. L., & Coccaro, E. F. (2006). Intermittent explosive disorder-integrated research diagnostic criteria: Convergent and discriminant validity. *Journal of Psychiatric Research, 40*(3), 231–242.

McCloskey, M. S., & Coccaro, E. F. (2003). Questionnaire and Interview Measures of Aggression in Adults. In E. F. Coccaro (Ed.), *Aggression: Psychiatric Assessment and Treatment* (pp. 167–193). Marcel Dekker.

McCloskey, M. S., Kleabir, K., Berman, M. E., Chen, E. Y., & Coccaro, E. F. (2010). Unhealthy aggression: Intermittent explosive disorder and adverse physical health outcomes. *Health Psychology, 29*(3), 324–332.

McCloskey, M. S., Noblett, K. L., Deffenbacher, J. L., Gollan, J. K., & Coccaro, E. F. (2008). Cognitive-behavioral therapy for intermittent explosive disorder: A pilot randomized clinical trial. *Journal of Consulting and Clinical Psychology, 76*(5), 876–886.

Murray-Close, D., Ostrov, J. M., Nelson, D. A., Crick, N. R., & Coccaro, E. F. (2010). Proactive, reactive, and romantic relational aggression in adulthood: Measurement, predictive validity, gender differences, and association with Intermittent Explosive Disorder. *Journal of Psychiatric Research, 44*(6), 393–404.

Osman, A., Kopper, B. A., Barrios, F. X., Osman, J. R., & Wade, T. (1997). The Beck Anxiety Inventory: Reexamination of factor structure and psychometric properties. *Journal of Clinical Psychology, 53*(1), 7–14.

Pfohl, B., Blum, N., & Zimmerman, M. (1995). *Structured Clinical Interview for DSM-IV Personality*. American Psychiatric Press.

Rynar, L., & Coccaro, E. F. (2018). Psychosocial impairment in DSM-5 intermittent explosive disorder. *Psychiatry Research, 264*, 91–95.

Snyder, C. R., Crowson, J. J., Houston, B. K., Kurylo, M., & Poirier, J. (1997). Assessing hostile automatic thoughts: Development and validation of the HAT scale. *Cognitive Therapy and Research, 21*(4), 477–492.

Spielberger, C. D. (1999). *STAXI-2 state trait anger expression inventory-2, professional manual*. Psychological Assessment Resources Inc..

Spitzer, R. L., Williams, J. B. W., Gibbon, M., & First, M. B. (1995). *Structured Clinical Interview for DSM-IV*. American Psychiatric Press.

Stanford, M. S., Helfritz, L. E., Conklin, S. M., Villemarette-Pittman, N. R., Greve, K. W., Adams, D., & Houston, R. J. (2005). A comparison of anticonvulsants in the treatment of impulsive aggression. *Experimental and Clinical Psychopharmacology, 13*(1), 72–77.

Tracey, T. J., & Kokotovic, A. M. (1989). Factor structure of the Working Alliance Inventory. *Journal of Counseling Psychology, 1*, 207–210.

Wilson, G., Fairburn, C., & Agras, W. S. (1997). Cognitive-behavioral therapy for bulimia nervosa. In G. P. Garner (Ed.), *Handbook of Treatment for Eating Disorders* (pp. 67–93). Guilford Press.

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