

Emotional Dysregulation as a target in the treatment of co-existing substance use and borderline personality disorders: A pilot study

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Abstract

Background: Borderline Personality Disorder (BPD) and Substance Use Disorders (SUD) are frequently co-morbid and their co-occurrence exacerbates the symptomatology and associated harms for both disorders. However, few intervention studies have examined the delivery of an integrated intervention for BPD and SUD within alcohol and other drug (AOD) treatment settings. This single arm pilot study examined the clinical utility and outcomes of a 12-session emotion regulation intervention for clients with co-occurring SUD and BPD symptoms delivered in an outpatient AOD treatment setting.

Method: Forty-five adult treatment-seekers (64.4% women, mean age 35.8 years [$SD=10.4$]) attending an outpatient AOD service, who exhibited three or more symptoms of BPD, engaged in a 12-session emotion regulation intervention. Clinical measures assessing alcohol and drug use, BPD symptoms, emotion dysregulation and acceptance, non-avoidance of thoughts and emotions, and psychological flexibility were collected at baseline, session six and session 12. Treatment engagement, satisfaction and rapport were also measured.

Results: Fifty-one percent of participants completed the 12-session intervention. The results demonstrated that the number of drug using occasions in the past 28 days significantly reduced from baseline compared to session 12. Furthermore, a significant reduction was identified in BPD symptom severity, emotion dysregulation, and non-acceptance, experiential avoidance and psychological inflexibility from baseline to session 12.

Conclusions: For those individuals who completed the 12-session emotion regulation intervention, there were significant reductions across a number of clinical outcomes. However, retention in treatment for this vulnerable client group remains a significant challenge in the AOD setting.

Key Points

1. A 12-session emotion regulation intervention shows promise in treating people with BPD symptoms within an AOD treatment setting.
2. Completion of 12 sessions was associated with reduced symptoms of BPD, fewer episodes of drug use, reduced emotion dysregulation, and improved acceptance, non-avoidance and psychological flexibility.
3. Further investigation into enhancing treatment retention for this population is needed.

1. Introduction

The co-occurrence of borderline personality disorder (BPD) and substance use disorders (SUD) is a common and clinically relevant phenomenon that exacerbates the symptomatology and associated harms for both disorders and, in turn, contributes to chronicity (Trull et al., 2016). BPD is characterised by a pervasive pattern of instability in affect, interpersonal relationships, and self-image with clinical features including emotional dysregulation, impulsivity, inappropriate anger and aggression, and recurrent suicidal behaviours or threats (American Psychiatric Association, 2013). These features arguably contribute to the stigma associated with the diagnosis (Aviram, Brodsky, & Stanley, 2006). SUD are similarly stigmatised and are characterised by continued use of a substance in spite of cognitive, behavioural, interpersonal and social dysfunction. One of the most prominent clinical factors common to both disorders is difficulty coping with, or intolerance to, negative emotions. BPD has been theorised as a disorder of emotion regulation (Linehan, 1993), and problematic substance use has widely been conceptualised as an effort to regulate negative emotions (see Berking & Wupperman for review, 2012). In their most severe forms, both BPD and SUD are chronic disorders with common clinical determinants, which share profoundly negative impacts on major areas of functioning, including cognition, affective or emotional expression, quality of interpersonal relationships and impulse control (American Psychiatric Association, 2013).

1.1. Clinical Determinants, Harms and Prognosis of Co-occurring BPD and SUD

While population prevalence rates for BPD are estimated to be between 1-6% (Trull, Sher, Minks-Brown, Durbin, & Burr, 2000; Trull et al., 2016), rates of BPD among treatment-seeking substance users are estimated to be as high as 65% (Darke, Ross, Williamson, & Teesson, 2005; Rosic et al., 2017; Trull et al., 2000). The exacerbation of

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symptomatology through the interaction between the disorders is of particular relevance to treatment planning as this contributes to chronicity. Treatment seekers with co-occurring SUD and BPD have been found to experience greater levels of psychosocial dysfunction, more severe substance use, and riskier behaviours such as unsafe injecting, self-harm and suicidal behaviour (Cacciola, Alterman, McKay, & Rutherford, 2001; Darke et al., 2005; Nace, Saxon, & Shore, 1986). Further, treatment studies indicate that clients with co-occurring SUD and BPD experience significantly higher rates of relapse, greater treatment non-compliance, and poorer overall treatment outcomes than those with either diagnosis alone (Gregory et al., 2008; Tull & Gratz, 2012). It is therefore evident that individuals who have co-occurring SUD and BPD are profoundly vulnerable and warrant tailored interventions.

1.2. Treatment of Co-occurring BPD and SUD

Despite the high rates of co-occurring BPD and SUD, associated harms, and poor prognostic indicators, there have been few studies examining integrated psychosocial interventions for co-occurring BPD and SUD. A recent systematic review identified only 10 randomised controlled trials of psychosocial treatments for co-occurring BPD and SUD (Lee, Cameron, & Jenner, 2015). The reviewed treatments included dialectical behaviour therapy (DBT; Linehan, 1993), DBT adapted for substance users (Linehan et al., 2002; Linehan et al., 1999), dual focused schema therapy (DSFT; Ball, 1998), and dynamic deconstructive psychotherapy (DDP; Gregory & Remen, 2008). Although there were methodological limitations and mixed results, all of the reviewed studies demonstrated some treatment gains over time, including a reduction in SUD and/or BPD symptoms, and improvements in psychosocial outcomes. Nonetheless, these studies also highlighted the inherent difficulties in retaining individuals with co-occurring BPD and SUD in treatment. The DBT-based studies (11.5%: Harned et al., 2008; 36%: Linehan, 1999, 2002; 37%: van den Bosch, Verheul,

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Schippers, & van den Brink, 2002) and two DDP studies (33%: Gregory et al., 2008; 37%: Gregory, DeLucia-Deranja, & Mogle, 2010) had lower treatment attrition rates than the DFST studies (60%: Ball, Cobb-Richardson, Connolly, Bujosa, & O’Neill, 2005; 58%: Ball, Maccarelli, LaPaglia, & Ostrowski, 2011). However, attrition rates were commonly above 30% and ranged from 11.5% (DBT: Harned et al., 2008) to 73% (DDP: Gregory, Remen, Soderberg, & Ploutz-Snyder, 2009).

Of particular relevance to the present study was the observation that only three of the 10 studies reviewed were undertaken in AOD treatment settings. One was conducted in a residential rehabilitation setting (Ball et al., 2011), a second study was conducted in a methadone maintenance program (Ball, 2007), and the third was undertaken in an addiction treatment centre (van den Bosch et al., 2002). The remaining studies recruited participants from a variety of settings, including mental health clinics, needle exchange programs, emergency departments, inpatient psychiatric units, and residential drug and alcohol rehabilitation settings, but did not specify where treatment was delivered (Gregory et al., 2008; Gregory et al., 2009; Gregory et al., 2010; Harned et al., 2008; Linehan et al., 2002; Linehan et al., 1999). The paucity of treatment studies undertaken in outpatient AOD settings highlights a notable gap in our evidence base relating to targeted interventions to address the high rates of BPD comorbidity in treatment seeking substance users.

1.3. Emotion Dysregulation as a Clinical Determinant of both BPD and SUD

The clinical utility of unified treatments for co-existing mental health disorders has generated interest in recent years as a parsimonious way of conceptualising and responding to complexity (e.g., Meidlinger & Hope, 2017; Sloan et al, 2017). Informed by unifying theoretical models and empirical studies that propose shared underlying mechanisms in the development and maintenance of disorders that commonly co-occur, these ‘transdiagnostic’ approaches target core dysfunctional processes irrespective of diagnostic nomination

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(McEvoy, Nathan, & Norton, 2009). This approach assumes BPD and SUD are related disorders that share commonalities in their determinants and in their expression (Trull et al., 2000; Trull et al., 2016). Transdiagnostic treatment principles, applied with traditional SUD interventions, may feasibly be integrated into treatment as usual and offer a valid means of addressing coexisting BPD and SUD by targeting the underlying mechanisms of these disorders in clinical contexts.

Emotion dysregulation is one such transdiagnostic construct (Berking & Wupperman, 2012) that is a prominent feature of many conceptual models of both BPD and SUD (Carpenter & Trull, 2013; Crowell, Beauchaine, & Linehan, 2009; Linehan, 1993) and has been proposed as a possible mechanism of co-occurrence, along with affective instability, impulsivity/disinhibition, and childhood trauma (see Trull et al., 2016 for review). For example, Linehan's biosocial model has strong clinical utility and proposes that BPD is primarily a disorder of emotion dysregulation (see Crowell, et al., 2009 for elaboration). A growing body of empirical literature associates deficits across multiple domains of emotion regulation with BPD, including: a) an inability to accurately name, differentiate and discriminate between emotions; b) an inability to continue engaging in goal directed behaviour when distressed; c) the use of maladaptive emotion regulation strategies; and d) an increased tendency to use harmful strategies (e.g., self-harm) (Bornovalova et al., 2008; Buckholdt et al., 2014; Glenn & Klonsky, 2009; Gratz, Tull, & Levy, 2014).

The role of emotion regulation in SUD has also been widely recognised, with this construct conceptualised historically within prominent theoretical models, and empirically in both cross sectional and longitudinal research. For example, according to the self-medication hypothesis (Khantzian, 1997) and stress-coping (Wills & Shiffman, 1985) models of substance abuse, drugs are thought to serve as a coping function whereby they ameliorate negative affective states and facilitate general mood regulation. Similarly, the affective

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processing model (Baker, Piper, McCarthy, Majeskie, & Fiore, 2004) and experiential avoidance theories (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996) suggest that escape or avoidance of negative affect is the principal motive for substance use. Empirically, individuals with SUD report higher overall emotion dysregulation than both healthy controls (Fox, Axelrod, Paliwal, Sleeper, & Sinha, 2007) and social drinkers (Fox et al., 2007; Fox, Hong, & Sinha, 2008). Furthermore, substance users with co-occurring BPD have been shown to have higher levels of emotion dysregulation than those without the co-occurrence (Gratz, Tull, Baruch, Bornovalova, & Lejuez, 2008) and engage in a greater use of avoidant emotion regulation strategies than those without co-occurring BPD (Kruegelbach, McCormick, Schulz, & Grueneich, 1993). Finally, a large systematic review of the emotion regulation treatment literature found that improvements in emotion regulation occurred alongside reductions in symptoms of BPD and/or SUD following psychosocial interventions that were comparable to the intervention used in the present study (Sloan et al., 2017). Taken together, this body of literature highlights the potential utility of addressing emotion dysregulation as an adjunct to existing AOD treatments in individuals with co-occurring BPD and SUD.

1.4. Implementation Challenges for AOD Services in Australia

The unique characteristics of AOD service models in Australia pose significant challenges for the dissemination of appropriate treatment paradigms for this cohort of individuals with co-occurring BPD and SUD (Pennay et al., 2011). All psychosocial interventions reviewed in Lee et al.'s (2015) systematic review involved intensive treatment episodes with a minimum duration of six months. In the case of DBT and DDP, treatment duration ranged from 12 to 18 months, often requiring attendance at multiple group and individual sessions per week. These specialist intervention paradigms would arguably encounter significant implementation barriers within AOD service settings in Australia

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because they are largely inconsistent with the current service delivery model, which is characterised by comparatively briefer episodes of care delivered by clinicians who often do not have a specialist psychotherapeutic and/or professional background (Roche & Nicholas, 2016; Roche, O'Neill, & Wolinski, 2004). Further, given the mixed professional backgrounds of the AOD workforce and the primary counselling paradigms (e.g. relapse prevention and motivational interviewing), the intensive specialist therapies reviewed would require substantial resources in relation to staff training and service implementation (Bornovalova & Daughters, 2007; Roche et al., 2004; Staiger, Long & Baker, 2010). Briefer interventions that are theoretically aligned with prominent AOD counselling paradigms may overcome some of these barriers.

Acceptance and Commitment Therapy (ACT: Hayes, Strosahl, & Wilson, 1999) is one candidate that may overcome implementation barriers in AOD settings, because it is theoretically aligned with prominent AOD counselling approaches, (e.g. Mindfulness Based Relapse Prevention (MBRP): Bowen, Chawla, & Marlatt, 2010). Further, promising findings have been demonstrated for the efficacy of Acceptance and Commitment Therapy (ACT: Hayes, Strosahl, & Wilson, 1999) in the treatment of SUD (e.g. Gifford et al., 2004; Hayes et al., 2004; Smout, Longo, Harrison, Wickes, & White, 2010) and BPD (*'Wise Choices'*: Morton, Snowdon, Gopold, & Guymer, 2012). The use of ACT to address co-occurring SUD and BPD is yet to be examined.

Finally, the intensity of the specialist interventions reviewed by Lee et al. (2015) may pose significant challenges for implementation. Individuals with SUD presenting to outpatient AOD settings have high rates of socio-economic disadvantage and marginalisation, and histories of trauma and neglect; all of which impact their adherence to and retention in treatment (Lubman et al., 2016; Manning et al., 2017). Indeed, this cohort have been characterised as having chaotic and intermittent presentations to services and difficulty

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adhering to sequential, structured group programs like DBT, (Pennay et al., 2011). These significant barriers to implementation have brought into question the feasibility of embedding our current evidence-based treatments for co-occurring BPD and SUD in the Australian AOD service context. Given that the evidence-based treatments for BPD (e.g., DBT: Linehan, 1993) are difficult to implement in outpatient AOD, briefer, adjunctive interventions that are theoretically compatible with AOD counselling have been recommended to augment standard treatment (Zanarini, 2009). As such, adjunctive treatment approaches for co-occurring BPD and SUD that can be widely implemented and integrated into current AOD service models are worthy of examination.

1.5. Present Study

In light of a) the high rates of BPD and SUD co-occurrence in treatment seeking substance users and the acute vulnerability associated with this cohort; b) the theoretical and empirical support for emotion dysregulation as a common clinical determinant in both disorders; and, c) the disputed feasibility of implementing our current evidence-based treatments for co-occurring BPD and SUD in AOD service settings, the current study sought to pilot an adjunctive ACT-based emotion regulation intervention in individuals with co-occurring BPD symptoms and SUD in an outpatient AOD setting. The primary aim of this study was to examine if individuals who received a 12-session emotion regulation intervention, as an adjunct to standard AOD counselling, demonstrated reductions in BPD symptoms, emotion dysregulation, substance use, and non-acceptance, experiential avoidance and psychological inflexibility. It was hypothesised that individuals who engaged in the 12-week emotion regulation intervention would demonstrate: 1) a reduction in BPD symptoms; 2) reduced drug and alcohol use; 3) reduced emotion dysregulation; and, 4) reduced non-acceptance, experiential avoidance and psychological inflexibility.

2. Methods

2.1. Participants

Participants consisted of 45 adult treatment seekers, 29 women (64.4%) and 16 men (35.6%), attending counselling at an outpatient AOD treatment service in Melbourne, Victoria. Ages ranged from 21 to 61 years, with an average of 35.8 years ($SD=10.4$ years). The majority of participants were born in Australia (88.9%), with a small contingent born in New Zealand (6.7%), England (2.2%), and Sri Lanka (2.2%). None of the participants identified as Aboriginal or Torres Strait Islander descent. Approximately half the sample (46.7%) had previously engaged in AOD treatment. The majority of the sample (67%) had used alcohol in the four weeks before the intervention commenced, 40% reported amphetamine use, and 38% cannabis use (refer to Table 1 for more information). Over half of the sample (62%) reported polysubstance use.

Insert Table 1 here

2.2 Study design

This study utilised a single arm design to evaluate the effect of a 12-session individually administered emotion regulation intervention on symptoms of BPD, drug and alcohol use, emotion dysregulation, and acceptance, non-avoidance and psychological flexibility.

2.3 Procedure

Eligibility for inclusion in the study was assessed at intake for the outpatient AOD service through a comprehensive clinical interview conducted by an AOD clinician which included completion of the Specialist Assessment Form for Victorian AOD Services

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(Department of Human Services, 2000). Individuals were invited to participate in the study if they met the following inclusion criteria: (a) current drug and/or alcohol use disorder requiring treatment, (b) the presence of three or more BPD symptoms in accordance with criteria from the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000) and, (c) either a current or historic diagnosis of BPD. Individuals were excluded from the study if they were unable to provide informed consent, experienced current psychosis, had a crisis presentation or acute and imminent suicidality. Existing clients of the service who met the inclusion criteria were also invited to participate in the study.

Eligible clients were invited to participate and provided written informed consent to receive 12 sessions of the intervention as an adjunct to standard AOD counselling (i.e., motivational interviewing, relapse prevention, and withdrawal counselling). Participants were required to complete a battery of measures across three time points: baseline (time one), session six (time two), and at the completion of session 12 (time three). Approval from the relevant hospital ethics committee was obtained.

2.4 Emotion regulation intervention

The emotion regulation intervention was adapted from *Wise Choices* (Morton & Shaw, 2012; Morton, Snowdon, Gopold & Guymer, 2012), a group-based ACT intervention for BPD, with a focus on emotion regulation. *Wise Choices* was developed by Spectrum Personality Disorder Service, a specialist BPD service in Victoria, Australia. In addition to key ACT concepts, *Wise Choices* focuses on increasing emotion acceptance, reducing avoidance of both difficult emotions and thoughts, and building other emotion regulation skills (Morton & Shaw, 2012). *Wise Choices* has been shown to improve emotion regulation skills and reduce hopelessness and symptoms of BPD when delivered to individuals with

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BPD in a group format (Morton, Snowdon, Gopold, & Guymer, 2012), but has not previously been evaluated in outpatient AOD treatment settings in individuals with co-existing BPD and SUD.

The clinicians in the present study delivered the key concepts, clinical exercises and worksheets from *Wise Choices* (see Table 2) in individual AOD counselling over 12 sessions. For example, the *Wise Choices* ‘avoidance loop’, which addresses how to tolerate uncomfortable emotions while acting in line with personal values, was incorporated into client formulations. When integrated in to AOD counselling, substance use was commonly identified as an avoidant strategy for managing overwhelming emotions. The intervention was considered to be delivered with fidelity if clinicians were: (1) adopting an acceptance-based stance, (2) developing client formulations based on the ‘avoidance loop’; (3) promoting the acceptance of emotions in order to reduce the suffering associated with emotional avoidance; (4) identifying values to guide behaviour; (5) refraining from challenging the content of cognitions; and (6) implementing mindfulness practice. Additional ACT resources for participants were drawn from *The Happiness Trap* (Harris, 2013) and *ACT Made Simple* (Harris, 2009). Experienced AOD clinicians from varying professional backgrounds and post-graduate trainee clinical psychologists delivered the intervention. All clinicians had exposure to a range of training activities including attendance at a one-day workshop on adopting an ACT approach for BPD. Adherence to ACT and the use of the intervention was supported through fortnightly consultation sessions with one of the chief investigators and co-author of *Wise Choices* (JM), and in clinical supervision by the lead investigator (KH). Adherence to key theoretical underpinnings and the use of ACT-informed strategies and resources was monitored through case studies presented during consultation sessions, which also provided an avenue for coaching and case-based learning.

Insert Table 2 here

2.5. Measures

2.5.1. The Specialist Assessment Form for Victorian AOD Services (Department of Human Services, 2000) is a structured and comprehensive clinical interview conducted at intake for all clients presenting for AOD treatment. The Specialist Assessment Form covers current and historical substance use, current mental health issues and mental state, current service involvement, and psychiatric, psychosocial, legal and medical history.

2.5.2. Drug and alcohol use. The Australian Treatment Outcomes Profile (ATOP; Ryan et al., 2014), a psychometrically valid instrument for measuring treatment outcomes relating to substance use, health and wellbeing, was used to assess drug and alcohol use outcomes. The ATOP is a brief scale measuring the number of days during the past four weeks that the respondent has used each of the named substances: alcohol, heroin, other opiates, cocaine, amphetamine type stimulants, cannabis, benzodiazepines, and one other named substance. A higher number of drug or alcohol using days is indicative of potentially harmful substance use. Two other sections of the scale (assessing injecting practices and crime) were not administered. The ATOP has demonstrated acceptable concurrent validity and interrater reliability (Ryan et al., 2014). Intraclass correlation coefficients for scale measures and Cohen's kappa for dichotomous measures reached or exceeded 0.75 and 0.61, respectively (Marsden et al., 2008).

2.5.3. BPD symptoms. The Borderline Evaluation of Severity over Time (BEST; Pfohl & Blum, 1997) is a brief self-report measure of degree of impairment on BPD criteria over the past month. BPD-specific symptom severity is assessed across three domains: negative thoughts and feelings, negative behaviours, and positive behaviours. Each item is rated on a 5-point Likert scale to form an aggregate score ranging from 12 to 72, with higher scores indicating increased severity of BPD symptoms. Scores of ≥ 30 indicate that the severity of symptoms suggest clinically relevant levels of BPD pathology (Dixon-Gordon et

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al., 2015). The BEST has good internal consistency (Cronbach $\alpha = 0.90$), is sensitive to change, has good test-retest reliability, and has adequate convergent and excellent discriminant validity (Blum, Pfohl, St. John, Monahan, & Black, 2002). Internal consistency in the current study was also high ($\alpha = .85$)

2.5.4. Emotion dysregulation. The Difficulties in Emotional Regulation Scale (DERS; Gratz & Roemer, 2004) is a 36-item measure that assesses individuals' typical levels of emotional dysregulation across six separate domains: non-acceptance of negative emotions, inability to engage in goal directed behaviours when experiencing negative emotions, difficulties controlling impulsive behaviours when experiencing negative emotions, limited access to emotion regulation strategies perceived as effective, lack of emotional awareness, and lack of emotional clarity. Items are scored on a 5-point scale ranging from 1 (*almost never*) to 5 (*almost always*), with higher scores reflecting greater difficulty regulating emotions. The DERS has been found to have high internal consistency ($\alpha=.93$), good test-retest reliability and adequate construct and predictive validity (Gratz & Roemer, 2004). The internal consistency for the current study was .95.

2.5.5. Acceptance, non-avoidance, and psychological flexibility. The Acceptance and Action Questionnaire version 2 (AAQ-II; Bond et al., 2011) is a 7-item measure that assesses dimensions of emotion regulation such as experiential avoidance of difficult thoughts and emotions, acceptance, and readiness to take action based on values. Items are scored on a 7-point scale ranging from 1 (*never true*) to 7 (*always true*). Lower scores indicate non-avoidance of difficult thoughts and emotions, acceptance, and greater levels of 'psychological flexibility', which is the ability to persist or change behaviour in accordance with chosen values (Fletcher & Hayes, 2005). The AAQ-II has adequate reliability and

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validity with a mean alpha coefficient of .84 and 3- and 12-month test-retest reliability of .81 and .79, respectively. In the current study, the Cronbach alpha coefficient was .94.

2.5.6. Treatment engagement. The Treatment Engagement CEST short form (TCU ENG) adapted from the Texas Christian University (TCU) Client Evaluation of Self and Treatment (CEST; Joe, Broome, Rowan-Szal & Simpson, 2002), is a 36-item measure consisting of four scales: Treatment Participation, Treatment Satisfaction, Counselling Rapport, and Peer Support. The Peer Support scale was not administered as the treatment was individually delivered. Scores range from 10 to 50, with higher scores indicating greater levels of participation, satisfaction and counselling rapport. The TCU-Engagement scales have been found to have acceptable construct validity and acceptable reliabilities, with reported alpha coefficients of .92 for Treatment Participation, .88 for Treatment Satisfaction, and .96 for Counselling Rapport (Joe et al., 2002). In the current study, internal consistency for Treatment Participation was .79, .68 for Treatment Satisfaction, and .87 for Counselling Rapport.

3. Statistical Analysis

To assess if there was a significant change in the key outcomes over the intervention period, two main analyses were conducted. First, a hurdle model was employed to examine if the frequency of drug and alcohol use in the past 28 days had changed at each of the assessment periods: baseline (time one [T1]), session six (time two [T2]), and session 12 (time three [T3]). The rationale for applying this analysis was that the alcohol and drug use variables exhibited excessive zeros and had significant positive skew and heteroskedasticity, which can be addressed using a hurdle model approach. The hurdle model was estimated in two parts: (1) a logistic regression was used to model whether or not an individual consumed alcohol or drugs in the prior 28 days ('alcohol episode' or 'drug use episode'); and, (2) a

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mixed effects model was used to predict the number of standard drinks consumed on days where the person was drinking ('alcohol occasions quantity' and 'drug use occasions quantity'). Second, to examine if marginal mean changes on the AAQ-II, BEST and DERS occurred across the study period (e.g., from T1 to T2 to T3), a mixed effect regression was used to assess this. Please note, that for both analyses an individual cluster robust variance estimator was applied to account for the hierarchical nature of the data in which observations are nested within the individual. Moreover, missing data in the analyses was addressed using maximum likelihood estimation.

Secondary analyses performed included an independent sample *t*-test to determine if there were differences between the intervention completers and non-completers in age, drug and alcohol use, and scores on the BEST, AAQ-II, and the DERS at baseline. Chi-square tests were conducted to test the difference in the proportion of males and females completing the intervention compared to those who did not complete the intervention. All analyses were performed using STATA (StataCorp 2013).

4. Results

4.1 Attrition

A total of 23 participants out of 45 (51%) completed the 12-session intervention and responded to the assessment at baseline (T1), after session six (T2) and at the completion of session 12 (T3). Eight of 45 participants (18%) completed assessments at T1 and T2. Fourteen of the 45 (31%) participants only completed the T1 assessment. Given the significant attrition, all analyses described below include all participants (N=45), rather than just those who completed the 12-session intervention.

4.2 Baseline Characteristics for Intervention Completers and Non-Completers

Preliminary analyses were conducted to evaluate whether the likelihood of completing the entire 12 sessions of the intervention, compared to not completing 12 sessions (i.e., those who completed one or two assessment points), was related to individual difference variables assessed at T1 (see Table 3). In terms of gender, there was no significant difference between the proportion of males and females who completed the intervention compared to those who did not ($\chi^2(1) = 1.84, p = .18$). Drug and alcohol use in the 28 days prior to T1 and participant age did not significantly differ across the intervention completion and non-completion groups (see Table 3). Participants who completed the intervention had significantly higher scores on the BEST, AAQ-II and the DERS compared to those who did not complete the intervention.

Insert Table 3 here

4.3 Primary Intervention Outcomes

Participants demonstrated a significant reduction in the number of occasions they had used drugs in the prior 28 days from T1 ($M=25.97, SD= 3.38$) to T3 ($M=15.5, SD=3.56, \Delta - 11.82 (3.80), p < 0.01$). No other significant reduction was observed for drug or alcohol use in either the categorical outcome, or the continuous outcome, across the time points. Participants demonstrated a significant reduction from T1 to T2, and from T1 to T3 on the BEST, DERS and AAQ-II (refer to Table 4 for more information). In addition, participants demonstrated significant reduction in their BEST, DERS and AAQ-II scores from T2 to T3.

Insert Table 4 here

4.4 Intervention Engagement Outcomes

Participants' degree of engagement in the intervention was assessed at sessions six and 12. The mean scores for the Treatment Participation, Satisfaction and Counselling Rapport scales (TCU-Engagement; Joe et al., 2002) are reported in Table 5. The results indicate high participation, satisfaction and rapport as they all exceed the acceptable cut off score of 30 (TCU Institute of Behavioral Research, 2005).

Insert Table 5 here

5. Discussion

The present study sought to examine the clinical utility and relevant clinical outcomes of an emotion regulation intervention for SUD and symptoms of BPD when delivered adjunctively to AOD counselling in an outpatient setting. Symptoms of BPD, emotion dysregulation, substance use, and acceptance, non-avoidance of difficult thoughts and emotions, and psychological flexibility were compared over three time points during the course of the 12-session intervention. Treatment engagement, satisfaction, rapport and retention were also examined. Participants were recruited from an outpatient AOD service and were largely representative of the AOD treatment-seeking population, typified by poly-drug using histories. The adjunctive emotion regulation intervention appears feasible for implementation in AOD service settings given the promising clinical outcomes and high levels of treatment engagement, satisfaction and rapport. However, attrition was an issue.

5.1. Clinical Implications

Consistent with our predictions, there were four key findings with clinical implications. First, a significant reduction in overall emotion dysregulation was observed across all time points. This change in emotion dysregulation is consistent with findings from a systematic review (Sloan et al., 2017) which found that emotion regulation is amendable to change when targeted by psychological interventions similar to the intervention employed in the present study. Second, improvements were observed in non-avoidance of difficult thoughts and feelings, acceptance, and psychological flexibility throughout the intervention period. The acceptance of discomfort associated with drug and alcohol cravings is purposely cultivated in a mainstay of AOD counselling methods (i.e. Mindfulness Based Relapse Prevention (MBRP): Bowen et al., 2010), and therefore may have contributed the successful alignment of the ACT principles from the present emotion regulation intervention. Third, BPD symptom severity declined over the intervention period. These findings are consistent with intervention studies for BPD examining acceptance-based interventions with an emotion regulation focus, which have successfully reduced self-harm, emotion dysregulation, experiential avoidance, and BPD symptomatology among women with BPD (Gratz & Gunderson, 2006; Gratz & Tull, 2011). Finally, there was a significant reduction from baseline to session 12 in the number of drug-using occasions. Substance misuse is proposed to be one of the most common maladaptive emotion regulation strategies used by individuals with BPD (Trull et al., 2000), and individuals with co-occurring SUD and BPD have been shown to use substances and experience cravings in response to negative emotion, social rejection and tension, significantly more often than individuals with SUD alone (Kruegelbach, McCormick, Schulz, & Grueneich, 1993). So this finding has particular clinical relevance. While reductions occurred in both BPD symptom severity and drug use

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after receiving the intervention, further research is needed to ascertain if interventions that reduce BPD symptomology, also act to reduce the frequency of drug use.

The reduction in drug use and BPD symptoms found in the current study are consistent with a systematic review of specialist interventions for co-occurring BPD and SUD (Lee et al., 2015), despite profound differences in treatment duration, delivery and intensity. While the specialist interventions reviewed by Lee et al., (2015) involved weekly group and individual sessions delivered for up to 18 months, the present study's intervention included 12 individually delivered sessions that were adjunctive to standard AOD counselling. These findings highlight the potential utility of relatively shorter, individually delivered treatments, based on emotion regulation principles for AOD settings.

Contrary to our hypotheses, a significant reduction in alcohol use was not found following the intervention. Given that the type of substance targeted in AOD counselling was not recorded, these findings may be reflective of the limited number of participants who engaged in treatment for alcohol use, rather than illicit substances. Regardless, further examination of this finding through larger studies is warranted. Overall, the initial findings from the present pilot study indicate that an emotion regulation intervention, delivered alongside AOD counselling, has clinical utility and the potential to address co-occurring BPD and SUD. The parallel improvements observed across emotion regulation, BPD severity, and drug use frequency in the present study are consistent with treatment studies of DBT in this cohort (Axelrod, Perepletchikova, Holtzman, & Sinha, 2011), despite the difference in treatment intensity and duration.

5.2. Appropriateness of Adjunctive Interventions

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The training requirements, costs, intensity, and duration of treatments that have been proven to be effective for treating BPD (i.e., DBT: Linehan, 1993) are prohibitive, limiting the likelihood of widespread implementation within AOD treatment settings. In accordance with recommendations for the implementation of adjunctive interventions to address BPD symptomatology (Zanarini, 2009), the current study investigated an intervention that was delivered within a community-based AOD service in addition to existing counselling. Indeed the findings support the appropriateness of implementing adjunctive emotion regulation interventions within AOD service settings. The intervention was flexibly delivered in response to the individual needs of participants, with individual sessions overcoming difficulties associated with attending set group times. Positive clinical outcomes were achieved upon completion of the intervention despite the relatively short duration of the intervention (12 sessions). However, further research is required to determine if these outcomes are sustained.

5.3. Retention, Satisfaction, Engagement and Counselling Rapport

In addition to the clinical outcomes, consistently high scores on measures of treatment engagement, satisfaction and rapport were recorded over the course of the 12-session intervention. The reported means in the present study were comparable to the treatment population norms based on accumulated assessments ($N=8,933$) across mixed modalities of drug treatment (i.e., outpatient clinics and residential programs) by the TCU Institute of Behavioral Research in the United States (2005). These findings suggest the emotion regulation intervention in the present study had comparable acceptability to a wide range of AOD treatments and therapeutic approaches, delivered to a diverse range of clients (TCU Institute of Behavioral Research, 2005).

Despite the high ratings of treatment satisfaction, rapport and engagement, rates of attrition in this study were notable. The attrition rate (49%) in the present study, though

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comparable to other psychosocial interventions for co-occurring BPD and SUD (Lee et al., 2015), highlights a particular challenge for AOD settings. While over two-thirds of the sample completed six sessions and more than 50% completed all 12 sessions, it is evident that the present study faced challenges regarding treatment adherence that are common to AOD treatment more generally (Manning et al., 2017, Lubman et al., 2016). It is worth noting, that retention difficulties of the present study were comparable to treatment studies for co-occurring BPD and SUD included in Lee et al.'s (2015) systematic review, where attrition ranged from 11.5% (Harned et al., 2008) to 73% (Gregory et al., 2009). Interestingly, the comparison between intervention completers and non-completers revealed few differences in age, and drug or alcohol use severity. However, completers had greater BPD symptom severity, emotion dysregulation, and experiential avoidance and psychological inflexibility than non-completers at baseline. It is therefore unlikely that the severity of pathology in BPD, a disorder characterised by extreme interpersonal dysfunction (APA, 2013), negatively impacted treatment engagement, rapport, satisfaction and retention. Instead, it could be argued that because of the severity of their BPD symptomatology, and related dysfunction, intervention completers were more motivated to remain engaged with the service and their treatment.

5.4. Limitations

The current study has a number of notable limitations. The sample size was small, though comparable to other studies conducted in treatment settings, and participants' diagnoses of BPD or SUD were not confirmed by structured clinical interviewing or scales of substance use severity. Just under 50% of participants did not complete the 12 sessions of the intervention, despite high ratings on treatment engagement, satisfaction and rapport. Additional comparisons between intervention completers and non-completers could have been enhanced, and potential predictors of retention identified, with collection of additional

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demographic information, such as education, employment status, and mental health diagnoses. This information was not collected given the preference to minimise the participation burden for treatment seekers. Moreover, intervention non-completers had disengaged from treatment at the service and were lost to follow up. More assertive follow up of non-completers could have provided useful information to inform future efforts to improve retention. Further research is needed to explore strategies for improving retention of clients with coexisting SUD and BPD in treatment within AOD service settings. The final assessment was conducted at session 12, therefore further research is needed to determine whether the clinical outcomes persisted post-intervention. In addition, the measures administered were largely self-report and administered by the participants' AOD counsellors, raising the potential for a response bias. Finally, this was an uncontrolled pilot trial, with no randomisation or control condition, meaning that it cannot be determined whether the improvements observed were specific to the intervention. Indeed, preliminary results from a randomised controlled treatment of DBT applied to substance use conducted by Linehan, Lynch, Harned, Korslund, and Rosenthal (2009) did not find improved emotion regulation to be specific to the DBT treatment condition.

5.5 Conclusion

Despite the high rates of co-occurrence, associated harms and poor prognostic indicators, there have been few studies examining integrated psychosocial interventions for co-occurring BPD and SUD that may inform tailored interventions for this vulnerable client group. For those interventions with an evidence base, significant barriers to implementation bring into question their feasibility in the Australian AOD service context. The present study examined the utility and preliminary clinical outcomes of an adjunctive emotion regulation intervention for co-occurring BPD and SUD. The pilot nature of the present study and significant limitations prevent definitive conclusions about the effectiveness of the

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intervention from being drawn. However, emotion regulation interventions may prove useful as an adjunctive therapy to standard outpatient AOD counselling for individuals with co-occurring BPD and SUD. This type of adjunctive intervention may be an important aspect to be incorporated in the treatment of AOD issues more broadly. Further research utilising a more rigorous design that is adequately powered, as well as longer-term follow-up, is required to determine the effectiveness of such an approach. Finally, in spite of the promising results, strategies to improve treatment retention remains an area requiring further research.

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Table 1

Characteristics of Participants' Substance Use in the Four Weeks Prior to Baseline Assessment

Type of substance used	(% of sample)
Alcohol	66.7
Amphetamine type stimulants	40.0
Cannabis	37.8
Benzodiazepines	22.2
Heroin or other opiates	22.2
Cocaine	2.2
Other	9.0
<u>Poly-substance use</u>	<u>(% of sample)</u>
Two substances	24.4
Three substances	24.4
Four or more substances	13.3
<u>Frequency of use</u>	<u>Days of use in the previous four weeks</u>
Substance use	17
Alcohol use	9

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Table 2

Content Overview of the Wise Choices Group-Based Intervention Adapted for the Present Study

Intervention elements	Example of session content
1. Introduction to ACT and mindfulness	Foundations of Acceptance and Commitment Therapy; introduction to mindfulness practice; use of metaphor.
2. Avoidance and values	Identifying difficult thoughts and feelings; the ‘avoidance loop’; preliminary work on identifying values.
3. Willingness and acceptance	Experimenting with different ways of relating to painful emotional experiences; willingness metaphors.
4. Awareness of thoughts	Psychoeducation on the mind; defusion exercises – promoting cognitive flexibility.
5. Mindfulness and pleasure	Exploring pleasurable sensations via the five senses while noticing difficult thoughts and feelings that may arise.
6. Emotion awareness and acceptance	Practicing acceptance strategies with emotions, body sensations, and urges. Strategies for acting in line with personal values.
7. Health issues	Exploring values and experiential avoidance related to health.
8. Acting on relationship values- reaching out	Conversation skills. Practicing awareness and acceptance of difficult thoughts and feelings.
9. Acting on relationship values in conflictual situations	Practice of assertiveness and negotiation skills.
10. Choice points	Noticing decision making in triggering situations i.e. ‘choice points’; planning a step in a valued direction.
11. Obstacles	Review; exploration of thoughts and feelings that arose; practice of mindfulness and acceptance strategies.

Note: Adapted from Morton et al., 2012. For more information, please see the treatment manual (Morton & Shaw, 2012) which is available from Spectrum Personality Disorder Service for Victoria via the website www.spectrumbpd.com.au.

Table 3

Descriptive Statistics and Independent t-test for Intervention Completers and Non-Completers

Variable	Intervention Completers (n=23)	Intervention Non-completers (n=22)	<i>t</i> -statistic (<i>df</i>)	<i>p</i>
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)		
Age	35.61 (12.70)	35.91 (7.45)	.10 (35.83)	.92
ATOP drug	16.4 (20.7)	19.4 (8.7)	.51 (43)	.62
ATOP alcohol	10.5 (10.2)	8.4 (9.7)	-.84 (43)	.41
BEST	37.9 (10.4)	29.6 (8.2)	-2.84 (43)	<.01**
AAQ-II	36.7 (6.8)	25.7 (11.0)	-4.00 (34.72)	< .001**
DERS	115.7 (23.8)	97.6 (27.7)	-2.37 (43)	.023*

Note. ATOP=Australian Treatment Outcome Profile; BEST=Borderline Evaluation of Severity over Time; AAQ-II=Acceptance and Action Questionnaire; DERS=Difficulties in Emotion Regulation Scale. * = $p < .05$; ** $p < .001$.

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Table 4

Results of the Main Analyses Examining Substance Use, BEST, AAQ-II and the DERS at T1, T2 and T3

Variable	Baseline (T1) n=45	Session 6 (T2) n=31	Session 12 (T3) n=23	T1 vs T2	T1 vs T3	T2 vs T3
ATOP drug						
Categorical	69% (.07)	61% (.09)	61% (.10)	OR =0.72 (.25), $p=0.35$	OR =0.70 (.29), $p=0.39$	OR=0.98 (.42), $p=0.97$
Continuous	$M=25.97$ (3.38)	$M=21.47$ (4.28)	$M=15.5$ (3.56)	$\Delta -5.44$ (3.23), $p=0.09$	$\Delta -11.82$ (3.80), $p < 0.01$	$\Delta= -6.38$ (3.60), $p=0.08$
ATOP alcohol						
Categorical	67% (.07)	71% (.08)	65% (.10)	OR=1.22 (.49), $p=.62$	OR=0.94 (.42), $p=.89$	OR=0.77 (.26), $p=.44$
Continuous	$M=13.67$ (1.66)	$M=14.73$ (1.91)	$M = 13.67$ (1.66)	$\Delta 0.52$ (2.15), $p=0.81$	$\Delta 1.84$ (2.54), $p=.47$	$\Delta 1.32$ (2.26), $p=.56$
BEST	$M = 33.64$ (1.52)	$M = 29.84$ (1.53)	$M =27$ (2.13)	$\Delta -5.02$ (1.54), $p<.01$	$\Delta -8.62$ (2.10), $p<.001$	$\Delta -3.60$ (1.65), $p=0.03$
AAQ-II	$M = 31.29$ (1.59)	$M = 28.94$ (1.42)	$M = 26.04$ (1.78)	$\Delta -4.42$ (1.14), $p< .001$	$\Delta -9.30$ (1.49), $p < .001$	$\Delta -4.89$ (1.41), $p <.01$
DERS	$M =106.84$ (4.08)	$M =102.68$ (4.85)	$M = 90.17$ (5.29)	$\Delta -8.39$ (3.94), $p =.03$	$\Delta -22.69$ (4.61), $p<.001$	$\Delta -14.30$ (4.39), $p<0.01$

ATOP=Australian Treatment Outcome Profile; BEST=Borderline Evaluation of Severity over Time; AAQ-II=Acceptance and Action Questionnaire; DERS=Difficulties in Emotion Regulation Scale. % refers to those who score 1. Δ = delta which refers to the change in score. T1 = time one, T2= time two, T3= time three. Categorical refers to outcome as 0, 1. Continuous refers to the outcome of greater than 0.

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Table 5

Descriptive Data for Treatment Participation, Satisfaction and Counselling Rapport at T2 and T3 as measured by the TCU-Engagement Short Form.

Time	Treatment Participation <i>M</i> (SD)	Treatment Satisfaction <i>M</i> (SD)	Counselling Rapport <i>M</i> (SD)
Two (n=31)	40.14 (6.30)	40.01 (5.50)	43.86 (4.64)
Three (n=23)	42.72 (4.67)	42.51 (4.83)	44.60 (4.00)