Difficulties in Emotion Regulation in Treatment-Seeking Alcoholics with and without Co-Occurring Mood and Anxiety Disorders

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Abstract

Emotion regulation difficulties (ERD) are known to underlie mental health conditions including anxiety and depressive disorders and alcohol use disorder (AUD). Although AUD, mood, and anxiety disorders commonly co-occur, no study has examined the association between these disorders and ERD among AUD outpatients. In the current study, emotion regulation (ER) scores of AUD individuals with no co-occurring mental health condition were compared to the ER scores of individuals who met diagnostic criteria for co-occurring mood and/or anxiety disorders. Treatment-seeking AUD individuals ($N = 77$) completed measures of emotion regulation, alcohol use and psychological functioning prior to beginning a 12-week outpatient cognitive-behaviorally oriented alcohol treatment program. Individuals were classified as having no co-occurring mood or anxiety disorder (AUD-0, $n = 24$), one co-occurring disorder (AUD-1, $n = 34$), or two or more co-occurring disorders (AUD-2, $n = 19$). Between-group differences in emotion regulation, quantity/frequency of alcohol consumption, positive and negative affect, affective drinking situations, negative mood regulation expectancies, distress tolerance, alexithymia, trait mindfulness, and psychological symptom severity were examined. Compared with the AUD-0 group, the AUD-2 group reported significantly greater ERD, psychiatric distress and alcohol consumption, more frequent drinking in response to negative affect situations, greater interference from negative emotions, and less use of mindfulness skills. The AUD-1 group differed from AUD-0 group only on the DERS lack of emotional awareness (Aware) subscale. Emotion regulation scores in the AUD-0 group were comparable to those previously reported for general community samples, whereas levels of ERD in the AUD-1 and AUD-2 were similar to those found in other clinical

samples. Implications for the inclusion of ER interventions among AUD patients who might most benefit from such an intervention are discussed.

Keywords

Alcohol; Alcohol Use Disorder; Emotion Regulation; Emotion Regulation Difficulties; Anxiety; Depression; Dual Diagnosis

1. Introduction

Both theory and research indicate that the desire to regulate one's emotional experience is an important motive underlying alcohol use among individuals with alcohol problems (Baker et al., 2004; Cooper et al., 1995; Cooper et al, 1992; Cummings, Gordon, & Marlatt, 1980; Lowman, Allen, & Stout, 1996; Stasiewicz & Maisto, 1993). Difficulties in emotion regulation are defined by the absence of adaptive strategies (e.g., problem solving) coupled with the use of maladaptive strategies (e.g., emotional suppression) for regulating emotional responses (Aldao, Nolen-Hoeksema, & Schweizer, 2010). The assessment of emotion regulation among individuals diagnosed with an alcohol use disorder (AUD) yields important information because poor emotion regulation increases the risk for relapse to substance use in situations involving negative affect (Bandura, Caprara, Barbaranelli, Gerbino, Pastorelli, 2003). Yet, despite the growing interest in emotion regulation as a possible mechanism underlying problematic alcohol use and relapse (Barlow, Allen & Choate, 2004), little is known about the association of individual difference factors and emotion regulation difficulties among individuals with an AUD.

One important individual difference factor often associated with greater AUD severity and an increased risk for relapse is the presence of a co-occurring mood or anxiety disorder. Epidemiological evidence indicates that among individuals diagnosed with an AUD, 18.9% are diagnosed with a mood disorder and 17.1% with an anxiety disorder (Grant, Stinson, Dawson et al., 2004). These two diagnostic categories, which are defined, in part, by chronic emotion regulation difficulties (Gross & Levenson, 1997; Kring & Werner, 2004; Lynch, Robins, Morse & Krause, 2001), share high rates of comorbidity with AUDs. In separate literatures, individuals with alcohol use disorders and those with affective disorders have been shown to demonstrate greater deficiencies on multiple indices of emotional functioning (Witkiewitz, & Marlatt, 2004; Joorman & Stanton, 2016).

As greater attention is paid to the assessment and treatment of emotion regulation difficulties in AUD (Stasiewicz et al., 2013), it will be important to understand the interrelationship between co-occurring mood and anxiety disorders and emotion regulation difficulties. For some AUD patients, targeting emotion regulation difficulties may be an effective and efficient strategy for improving treatment outcomes and decreasing relapse risk (Barlow, Allen, & Choate, 2004; Stasiewicz et al., 2013).

Emotion regulation has demonstrated relationships with a number of psychological variables known to impact drinking and relapse to alcohol use during and following treatment. These include negative mood regulation expectancies (Kassel, Bornovalova & Mehta, 2006),

distress tolerance (Jeffries, McLeish, Kramer et al., 2016), alexithymia (Stasiewicz, Bradizza, Gudlieski, et al., 2012), mindfulness (Stasiewicz, Bradizza, Schlauch et al., 2013) and psychiatric symptom severity (Aldao, Nolen-Hoeksema & Schweizer, 2010). Thus, in addition to examining differences between the co-morbidity groups on emotion regulation, we were interested in exploring differences between co-morbidity groups on psychological variables relevant to both emotion regulation and alcohol relapse.

To date, few studies have assessed emotion regulation among alcohol use disorder patients (Fox, Hong, & Sinha, 2008; Lagerberg et al., 2017), and no known studies have examined emotion regulation difficulties and psychological functioning in treatment-seeking AUD patients with and without co-occurring mood and/or anxiety disorders. A greater understanding of emotion regulation difficulties among AUD individuals may lead to the identification of subgroups that are more likely to report such difficulties and therefore more likely to benefit from the addition of an emotion regulation intervention into existing alcohol treatment.

This exploratory study utilized data from a previously published parent study that reported on the development and initial efficacy of an affective intervention for alcohol use disorders (Stasiewicz, Bradizza, Schlauch et al., 2013). The purpose of the present analyses was to examine potential differences: (1) in emotion regulation difficulties between individuals without comorbid mood and/or anxiety disorders (AUD-0) and individuals with either one comorbid mood or anxiety disorder (AUD-1) or two or more comorbid mood or anxiety disorder (AUD-2) diagnoses, and also (2) on psychological variables relevant to emotion regulation and alcohol use and relapse including baseline alcohol use and functioning, high-risk alcohol use situations involving positive and negative affect, current negative and positive affect, negative mood regulation expectancies, distress tolerance, alexithymia, mindfulness, and psychological distress among the 3 comorbidity groups. We hypothesized that compared with the AUD-0 group, both the AUD-1 and AUD-2 groups would demonstrate poorer emotion regulation, greater endorsement of high-risk situations involving negative affect, greater levels of negative affect, greater negative mood regulation expectancies, poorer distress tolerance, greater alexithymia, lower levels of mindfulness, and greater psychological distress. No specific hypotheses were proposed for positive affect and high-risk situations involving positive affect.

2. Method

2.1. Participants

Participants were 77 adults (i.e., 18 years or older; 38 women, 39 men) seeking outpatient treatment for alcohol-related problems who met criteria for DSM-IV alcohol dependence and a negative affect drinking profile (see Section 2.3.5) and consumed at least one standard drink in the past 30 days. Individuals were excluded from participation if they evidenced any of the following: (1) acute psychosis, (2) DSM-IV drug use disorder other than nicotine or cannabis, (2) legal mandate to attend treatment, or (3) required alcohol detoxification services or a higher level of care. Descriptive statistics are reported for participants overall and separately for each disorder group in Table 1. Participants were predominantly European-American, in their mid-forties, had some college education, single or divorced,

and unemployed (See *Total Sample* column of Table 1). There were no statistically significant differences between groups on any demographic variables. At baseline, approximately 43% reported receiving previous outpatient treatment for alcohol problems and 15.1% reported at least one past episode of inpatient substance abuse treatment. Regarding co-occurring diagnoses among the AUD-1 and AUD-2 participants, 48.1% met criteria for generalized anxiety disorder, 45.5% major depressive disorder, 15.6% social phobia, 11.7% dysthymia, 3.9% panic disorder, 1.3% post-traumatic stress disorder, and 14.3% for marijuana abuse or dependence.

2.2 Procedures

The data presented come from a larger study intended to develop and pilot test a 12-session affectively-focused intervention for alcohol use disorder (Stasiewicz et al., 2013). The University at Buffalo Institutional Review Board reviewed and approved the study prior to data collection. The current study reports on data from the baseline (pretreatment) assessment only. Participants were recruited through radio and newspaper advertisements targeted for individuals interested in receiving 12 sessions of cognitive-behavioral treatment to change their drinking and also from those seeking treatment from the University at Buffalo Addiction Treatment Services (UB-ATS). The UB-ATS is a publicly-funded outpatient substance abuse clinic at the University at Buffalo's Research Institute on Addictions serving the Western New York community. All prospective participants were screened for initial inclusion and exclusion criteria and were given a description of the treatment program. Individuals willing to participate were scheduled for an intake appointment with a research interviewer. During the intake appointment, clinic staff assessed the remaining eligibility criteria (e.g., DSM-IV alcohol dependence, drug use disorder) and if eligible, obtained written informed consent to participate. Individuals were then scheduled for a baseline assessment during which they completed additional measures pertaining to substance use, psychological functioning, and emotion regulation skills. Participants were compensated $30 for completion of the baseline assessment.

2.3. Measures

Measures chosen have demonstrated good to excellent psychometric properties in samples of individuals diagnosed with an AUD.

2.3.1. Demographics and Substance Use History—Demographic characteristics, current status information (e.g., marital status, employment) and substance abuse treatment history were obtained using a comprehensive background questionnaire administered during the initial intake appointment.

2.3.2. Mini International Neuropsychiatric Interview—The Mini International Neuropsychiatric Interview (MINI; Sheehan, Lecrubier, Sheehan et al., 1998) was used to obtain a partial list of DSM-IV Axis I diagnoses. The sections for alcohol use, drug use, major depression, dysthymia, generalized anxiety, panic, social anxiety, and post-traumatic stress disorder were administered by trained research interviewers. The MINI has been shown to be a valid and reliable measure of DSM-IV psychiatric disorders (Sheehan et al., 1998).

2.3.3. Timeline Follow-Back—The Timeline Follow-Back (TLFB; Sobell & Sobell, 1992) is a calendar-based retrospective recall interview of daily alcohol use that was administered by trained interviewers. The TLFB was used to estimate the number of standard drinks consumed on each day and percent days abstinent over the 6-month period prior to the initial intake assessment. The TLFB has been determined to be a valid and reliable measure of alcohol consumption (see Sobell & Sobell, 1992 for a review).

2.3.4. Difficulties in Emotion Regulation Scale—The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a 36-item measure assessing self-reported emotion regulation difficulties. Participants are asked to indicate how often the items apply to them on a scale from 1 (almost never) to 5 (almost always). The DERS consists of six subscales: (1) non-acceptance of emotions (Non-acceptance), (2) difficulties engaging in goal-directed behavior when distressed (Goals), (3) impulse control difficulties (Impulse), (4) lack of emotional awareness (Awareness), (5) limited access to emotion regulation strategies (Strategies) and (6) lack of emotional clarity (Clarity). Higher scores indicate greater problems with emotion regulation. This measure has demonstrated good internal consistency (α = .93) and validity (Gratz & Roemer, 2004). Internal consistency in the current sample was good for the overall scale (α = .92) and also for subscales (αs = .84 – .92).

2.3.5. Inventory of Drug Taking Situations-Alcohol Version—The Inventory of Drug Taking Situations – Alcohol version (IDTS-A; Annis, Turner, & Sklar, 1997) consists of 50 questions assessing how frequently an individual reports drinking heavily in each situation over the past year from 1 (never) to 4 (almost always). Heavy drinking is measured across eight subscales including: (1) unpleasant emotions, (2) physical discomfort, (3) pleasant emotions, (4) testing personal control, (5) urges and temptations to drink, (6) conflict with others, (7) social pressure to drink, and (8) pleasant times with others. Participants whose highest subscale score was either unpleasant emotions (e.g., "When I felt anxious or tense about something" or "If I was depressed about things in general") or conflict with others (e.g., "When I felt tense or uneasy in the presence of someone;" or "When there were fights at home") were considered to have met the negative affect drinking profile study inclusion criteria. Study analyses examined pleasant emotions, unpleasant emotions and conflict with others subscales. This measure has demonstrated good internal consistency (overall α = .95; subscale αs = .70 – .92) and validity in treatment seeking samples of individuals with alcohol dependence (Annis, Turner & Sklar, 1997). Internal consistency in the current sample was good for the overall scale (α = .95) and for the three subscales (αs = .86 – .88).

2.3.6. Positive and Negative Affect Scale—The Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) is a 20-item scale assessing levels of positive and negative mood. Participants were asked to indicate the extent to which they were experiencing each emotion "right now" on a scale of 1 (very slightly or not at all) to 5 (extremely) such that higher scores indicate greater levels of affect. This measure has demonstrated good internal consistency for both the positive affect (α = .89) and negative affect (α = .85) scales and has demonstrated validity (Watson et al., 1988). Internal

consistency in the current sample was good for the positive (α = .84) and negative affect (α = .84) subscales.

2.3.7. Negative Mood Regulation Expectancies Questionnaire—The Negative Mood Regulation Expectancies Questionnaire (NMRQ; Catanzaro & Mearns, 1990) is a unidimensional, 30-item measure of a person's beliefs about their ability to alleviate or manage negative moods. All items begin with stem "When I'm upset, I believe that…" and are rated on a scale from 1 (strong disagreement) to 5 (strong agreement) with higher scores indicating greater negative mood regulation expectancies. This measure has shown good internal consistency (α = .87) and validity (Catanzaro & Mearns, 1990). Internal consistency in the current sample was good (α = .88).

2.3.8. Distress Tolerance Scale—The Distress Tolerance Scale (DTS; Simons & Gaher, 2005) is a 15-item measure of perceived capacity to manage emotional distress. Items are rated on a scale from 5 (strongly disagree) to 1 (strongly agree) with higher scores indicating greater tolerance for emotional distress. Psychometric studies indicate four factors that include: (1) attention absorbed by negative emotions and interference with functioning (Absorption), (2) assessment of the emotional situation as acceptable (Appraisal), (3) ability to regulate emotion (Regulation) and (4) ability to tolerate emotions (Tolerance) in addition to a total score. This measure has demonstrated good internal consistency (α = .89) and validity (Simons & Gaher, 2005). Internal consistency in the current sample was good for the overall scale (α = .88) and for subscales (αs =.70 – .77).

2.3.9. Toronto Alexithymia Scale—The Toronto Alexithymia Scale (TAS; Bagby, Parker, & Taylor, 1994) is a 20-item self-report measure assessing difficulties identifying and describing emotions. It consists of a total score and 3 subscales: (1) difficulty describing feelings, (2) externally-oriented thinking, and (3) difficulty identifying feelings. Items are rated on a 5-point scale from 1 (strongly agree) to 5 (strongly disagree) with higher scores indicating greater levels of alexithymia. Total scores greater than or equal to 61 indicate alexithymia, scores between 52 through 60 indicate possible alexithymia and those of 51 or less indicate non-alexithymia. This measure has demonstrated good internal consistency (overall α = .84; subscale αs = .62 – .80) and validity (Bagby et al., 1994). Internal consistency in the current sample was good for the overall scale (α = .82) and subscales (αs = .61 – .77).

2.3.10. Mindful Attention Awareness Scale—The Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) is a 15-item measure of dispositional (trait) mindfulness. It was administered to assess individual differences in the frequency of, and propensity to, experience receptive awareness and attention to what is taking place in the present moment. Items are rated on a 6-point scale from 1 (almost always) to 6 (almost never) with higher scores reflecting greater levels of trait mindfulness. This measure has demonstrated good internal consistency (α = .87) and validity (Brown & Ryan, 2003). Internal consistency in the current sample was good (α = .86).

2.3.11. Kentucky Inventory of Mindfulness Skills—The *Kentucky Inventory of Mindfulness Skills* (KIMS; Baer, Smith, & Allen, 2004) is a 39-item multidimensional

measure that assesses skills utilized during mindfulness practice consisting of four subscales: (1) observing or attending to stimuli (Observe), (2) labeling thoughts and emotions without judgment (Describe), (3) engaging attention fully in activities (Act with Awareness), and (4) accepting without judgment the present-moment experience (Accept without Judgment). Each item is rated on a 5-point scale from 1 (never or very rarely true) to 5 (almost always or always true) with higher scores indicating greater mindfulness skills. This measure has demonstrated good internal consistency (subscale αs = .82 – .91) and validity (Baer, Smith, & Allen, 2004). Internal consistency in the current sample was good for all subscales (αs = .81 – .90).

2.3.12. Brief Symptom Inventory—The Brief Symptom Inventory (BSI; Derogatis, 1983) is a 53-item self-report measure assessing a range of psychological symptoms including anxiety, depression, phobia, obsessive-compulsive, somatization, hostility, interpersonal sensitivity, paranoia and psychoticism. Participants rate the extent to which they have been bothered by symptoms in the past week from 0 (not at all) to 4 (extremely). Three global indices are calculated that reflect the overall level of psychological distress (Global Severity Index; GSI), number of self-reported symptoms endorsed greater than 0 (Positive Symptom Total; PST), and intensity of symptoms (Positive Symptom Distress Index; PSDI) with higher scores on all three indices indicating greater levels of distress. This measure has demonstrated good reliability (α = .87) and validity (Abu Ruz, Lennie, Riegel et al., 2010; Derogatis, 1983). Internal consistency in the current sample was good (α = .97).

2.3.13 Short Alcohol Dependence Data Questionnaire—The Short Alcohol Dependence Data Questionnaire (Raistrick, Dunbar & Davidson, (1983) is a unidimensional measure of present state alcohol dependence that is sensitive to the full range of dependence.

2.4. Statistical analyses

Based on the MINI diagnoses, all individuals met DSM-IV criteria for alcohol dependence (AUD) and were assigned to one of three groups: (1) no co-occurring mood or anxiety disorder (AUD-0), (2) one co-occurring disorder (AUD-1), or (3) two or more co-occurring disorders (AUD-2). Age was compared among disorder groups using one-way ANOVA. Categorical demographic variables were compared using the Fisher's exact test. Means scores of participants in the AUD-1 and AUD-2 groups were compared to scores of those in the AUD-0 group, using the Student's *t*-test pooled or Satterthwaite method for equal and unequal variances, respectively. The empirical data densities were visually examined for asymmetry and extreme values by boxplots (Tukey, 1977). Given the near-symmetry and absence of extreme values in all cases, statistical comparisons were conducted by Student's *t*-test, which is well-known to be robust against non-normality (Rasch & Guiard, 2004). The Holm (1979) method was used to control family-wise Type 1 error for multiple comparisons. Only the Holm-adjusted *p*-values are reported.

3. Results

3.1 Difficulties in Emotion Regulation Scale scores

The average Difficulties in Emotion Regulation (DERS) total score for the entire sample was 87.5 (SD = 24.4). Comparisons for DERS are reported in Table 2. Student's t-tests revealed that the DERS total score and each of the subscale scores were significantly greater in the AUD-2 group compared to AUD-0. Comparisons between the AUD-1 and AUD-0 groups yielded significant differences only for the DERS Aware subscale (p = .01). The overall pattern is one indicating greater emotion regulation difficulties among individuals with an AUD and two or more co-occurring disorders as compared to AUD individuals with no co-occurring disorders.

3.2 Alcohol-related variables

For the entire sample, over the 6-month period prior to the baseline assessment, participants reported an average of 9.46 (SD = 6.16) drinks per drinking day and 27.5% (SD = 21.1) of days abstinent. Comparisons involving alcohol-related variables are reported in Table 3. Student's t-tests indicated that the AUD-2 group reported drinking a significantly greater number of standard drinks on drinking days as compared with the AUD-0 group (p < .0001), whereas differences between the AUD-0 and AUD-1 groups were not significant. There were no significant differences between the AUD-2 group and the AUD-0 or AUD-1 groups on the percentage of days abstinent or the Short Alcohol Dependence Data total score. The Inventory of Drug Taking Situations-Alcohol Version (IDTS-A) subscale scores for the AUD-0 group indicated significantly lower scores for Unpleasant Emotions and Conflict with Others when compared with the AUD-2 group (p = .0005 and p < .0001, respectively) indicating that the AUD-2 group reported drinking heavily more frequently in both types of negative affect situations. No significant differences were found for the AUD-1 and AUD-0 comparisons on these two variables. Scores on the Pleasant Emotions subscale did not differ significantly between the groups.

3.3 Affect, mood regulation, distress tolerance, alexithymia, mindfulness, and psychological distress

Table 4 includes the results of the Student t-test comparisons of baseline measures of positive and negative affect (Positive and Negative Affect Scale [PANAS]), negative mood regulation expectancies (Negative Mood Regulation Questionnaire [NMRQ]), distress tolerance (DTS), alexithymia (TAS), trait mindfulness (KIMS, MAAS), and psychological distress (BSI).

3.3.1 Affect and negative mood regulation—The results of Student t-tests comparisons of the Positive and Negative Affect Scale (PANAS) indicated no significant differences between the AUD-0 and both the AUD-2 and AUD-1 groups. With respect to negative mood regulation expectancies, the student's t-test indicated no significant differences on the NMRQ total score for the AUD-2 or the AUD-1 groups as compared with the AUD-0 group.

3.3.2 Distress Tolerance and Alexithymia—Student's *t*-test comparison indicated significantly higher scores for the AUD-0 group as compared with the AUD-2 group on the Distress Tolerance Scale (DTS) – Absorption subscale ($p = .0009$) indicative of greater adaptive functioning for the AUD-0 group in the face of high negative affect. There were no other significant differences on group comparisons for the DTS scale.

Group comparisons of the Toronto Alexithymia Scale Total score and subscales using the Student's *t*-test indicated no significant differences between the AUD-0 group and either the AUD-2 or AUD-1 group.

3.3.3 Mindfulness—Group comparisons of the Mindful Attention and Awareness Scale (MAAS) Total score using a Student's *t*-test indicated no significant differences between the AUD-0 group and either the AUD-2 or AUD-1 group. Group comparisons of the Kentucky Inventory of Mindfulness Skills total and subscale scores using the Student's *t*-tests indicated significantly greater scores for the AUD-0 group as compared to the AUD-2 group on the total ($p = .012$) score, and the Accept without Judgment ($p = .05$) and Act with Awareness ($p = .02$) subscales indicating greater overall mindfulness skills, acceptance of present-moment experiences without judgment, and engaging attention fully in activities, respectively. Between-group comparisons for the AUD-0 and AUD-1 groups indicated no statistically significant differences on the total score or any of the subscales.

3.3.4 Psychological Distress—Comparisons between the AUD-0 and AUD-2 groups on the Brief Symptom Inventory Global Indices revealed statistically significant differences on the GSI ($p = .022$), PSDI ($p = .029$) and the PST ($p = .038$) indices indicating greater overall psychological distress, greater numbers of symptoms, and more severe psychiatric symptoms, respectively, among the AUD-2 group as compared with the AUD-0 group. Comparisons between the AUD-0 and AUD-1 groups indicated no statistically significant differences.

4. Discussion

This exploratory study is the first known to report on the relationships between mental health comorbidity, emotion regulation and associated alcohol, emotional and psychological functioning among adults seeking treatment for an alcohol use disorder (AUD). The results partially supported our study hypotheses. The overall pattern of results indicates poorer emotional regulation, heavier drinking, greater frequency of drinking in negative affect situations, and greater severity and intensity of psychological symptoms and some evidence of lower levels of mindfulness and worse distress tolerance among individuals with two or more co-occurring mood and/or anxiety disorders (AUD-2) as compared with individuals with no co-occurring disorders (AUD-0). Our hypotheses that the AUD-1 group would demonstrate significantly worse emotion regulation, alcohol and associated psychological functioning was not supported. The AUD-1 and AUD-0 groups evidenced comparable functioning in nearly all areas assessed.

Overall, there is strong evidence that individuals diagnosed with an AUD and two or more co-morbid mental health conditions experience significant difficulties in emotion regulation

as compared to individuals diagnosed with an AUD but no comorbid mental health conditions. With the recent development of emotionally- focused interventions for AUD and other disorders (e.g., Stasiewicz et al., 2013; Barlow et al., 2015; Bradizza et al., 2017), the results of this study suggest that these emotionally- focused interventions may be ideally suited for AUD outpatients who meet diagnostic criteria for a multiple co-occurring mood and/or anxiety disorders, but possibly inappropriate for those with no co-occurring or only one co-occurring disorder.

While there are no published norms for the DERS total score in clinical and non-clinical samples, our review of the literature indicates that among non-clinical samples or samples of normal controls, the total score ranges from the mid 50's on the low end to the mid 70's on the high end (Gratz & Tull, 2015; Kuo & Linehan, 2009; Fox et al, 2007). According to Gratz & Tull (2015), evidence suggests that nonclinical samples of college students and community adults average 75–80 on the DERS. In the present study, the mean DERS total score ($M = 74$) for the AUD-0 group is within this "normal" range. These findings indicate that outpatients with a diagnosis of AUD and no comorbid disorder have scores in or near ranges indicating adaptive emotion regulation functioning. Interestingly, individuals with an AUD and only one comorbid disorder (AUD-1) had a mean DERS total score ($M = 87.8$), above the "normal" range and corresponding to levels found among clinical samples of self-harming college students (Gratz & Chapman, 2007; Gratz & Roemer, 2008), individuals diagnosed with social anxiety disorder (Kuo & Linehan, 2009) and treatment-seeking individuals with cocaine use disorder (Fox et al., 2007). However, the mean DERS total and subscale scores for the AUD-1 group were not statistically significantly different than those of the AUD-0 group, with the exception of the DERS Aware scale, indicating comparable emotional functioning for the AUD-0 and AUD-1 groups.

For participants in the AUD-2 group, the mean DERS score of 104 corresponds to average scores reported in studies investigating emotion regulation difficulties in samples of individuals diagnosed with generalized anxiety disorder (Roemer et al., 2009; Salters-Pedneault et al., 2006) and PTSD symptoms at a severity level consistent with a diagnosis of PTSD (McDermott et al., 2009; Tull, Barret, et al., 2007). Thus, AUD individuals diagnosed with two or more co-morbid mood or anxiety disorders not only experience greater psychiatric symptoms but additionally, suffer from higher levels of mood dysregulation.

Overall, the results from the current study suggest that AUD individuals with multiple comorbid disorders may benefit from the addition of an emotion regulation intervention to standard alcohol treatment. However, among AUD individuals with no or only one co-occurring disorder, emotion regulation falls within or near the normal range. Thus, the present results suggest that AUD patients with no comorbid or only 1 comorbid disorder may not necessarily benefit from the addition of an emotion regulation intervention. While there are currently no recommended DERS cut-off scores for determining the need for a specialized emotion regulation intervention, a review of the literature suggests that DERS scores greater than 85 are often associated with disorders of eating, mood, anxiety, PTSD, and borderline personality (Gratz & Tull, 2015). However, given our findings, it may be that among individuals diagnosed with an AUD, a somewhat higher DERS cutoff score could be used to indicate the need for an emotion regulation intervention. There is an urgent need for

further research to determine an optimal DERS cut-off score. This is particularly important as it is not clear to what extent a standard CBT intervention for alcohol dependence will positively impact negative affect and emotion regulation skills. Although negative affect has been shown to decrease in AUD patients who achieve abstinence while receiving a standard treatment for alcohol dependence (e.g., Brown & Schuckit, 1988; Brown, Irwin, & Schuckit, 1991; Witkiewitz, Bowen, & Donovan, 2011), it is important for future research to determine whether the addition of an emotion regulation intervention to standard alcohol treatment will lead to greater improvements in adaptive emotion regulation skills for AUD individuals with two or more co-occurring mood and anxiety disorders compared to standard treatment alone. For example, in the Stage 1a/1b treatment development study, we developed an emotionally-focused treatment supplement that was added to standard CBT for alcohol use disorder (Stasiewicz et al., 2013). This combined intervention was tested against standard CBT plus a health and lifestyles treatment supplement in a sample of individuals who met criteria for DSM-IV alcohol dependence and reported frequent heavy drinking in response to negative affect. The addition of the emotionally-focused intervention led to greater improvements in drinking, several emotion regulation skills, and negative affect as compared to standard CBT for alcohol dependence. While these results support further efforts to develop and test emotion regulation interventions for adults with an AUD who report drinking frequently in response to negative affect, future research is needed to more carefully delineate groups of AUD individuals most likely to benefit from such an intervention.

Despite its strengths, including a sample of treatment-seeking individuals diagnosed with an alcohol use disorder and the use of measures with good psychometric properties, this exploratory study has a number of limitations. These include secondary data analyses from a parent study that recruited individuals seeking outpatient alcohol treatment. Thus, participants constitute a convenience sample that is not necessarily representative of all individuals seeking alcohol treatment. For example, the parent study excluded individuals with drug diagnoses other than marijuana or nicotine, thus potentially limiting generalizability of study findings. Additionally, the study sample size ($N = 77$) is not large so that the power of the study may have been insufficient for some variables. Lastly, emotion regulation was assessed solely by way of self-report. Future studies should consider the addition of behavioral/experimental tasks to assess ER (Hay, Sheppes, Gross, & Gruber, 2015; Scheibe, Sheppes & Staudinger, 2015).

The results of the present study suggest that among individuals with an AUD presenting for outpatient alcohol treatment, those with multiple co-occurring comorbid mood and anxiety disorders may derive the most benefit from the addition of an emotion regulation intervention to standard alcohol treatment. Further research is needed to confirm these findings and determine optimal DERS cut-off scores indicating the need for an emotion regulation intervention.

Acknowledgments

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Highlights

- Participants with two or more comorbid disorders reported significantly greater emotion regulation difficulties.

- They also reported greater alcohol consumption and drinking in response to negative affect situations.

- They reported greater psychiatric distress, interference from negative emotions and less use of mindfulness skills.

Table 1

Descriptive statistics for participants with AUD by disorder group, *N*=77.

	AUD-0 *n*=24	AUD-1 *n*=34	AUD-2 *n*=19	Total Sample	d.f.	F	P-value[a]
					d.f.	P	P-value[b]
Age, mean (SD)	47.8 (11.8)	44.3 (12.4)	45.4 (7.0)	45.7 (11.1)	(2, 74)	0.72	0.49
Gender, n (%)							
Male	13 (54.2)	20 (58.8)	6 (31.6)	39 (49.4)	2	0.007	0.16
Female	11 (45.8)	14 (41.2)	13 (68.4)	38 (50.7)			
Race, n (%)							
European-American	20 (83.3)	29 (85.3)	16 (84.2)	65 (84.4)	4	0.03	0.87
African-American	3 (12.5)	5 (14.7)	3 (15.8)	11 (14.3)			
Other	1 (4.2)	0	0	1 (1.3)			
Education, n (%)							
<High school	1 (4.2)	0	3 (15.8)	4 (5.2)	4	0.0006	0.18
High school graduate	11 (45.8)	13 (38.2)	6 (31.6)	30 (39.0)			
College graduate	12 (50.0)	21 (61.8)	10 (52.6)	43 (55.8)			
Income, n (%)							
<$20,000	7 (33.3)	7 (20.6)	5 (27.8)	19 (26.0)	6	0.0001	0.61
>$20,000–40,000	5 (23.8)	11 (32.4)	2 (11.1)	18 (24.7)			
>$40,000–60,000	4 (19.1)	5 (14.7)	5 (27.8)	14 (19.2)			
>$60,000	5 (23.8)	11 (32.4)	6 (33.3)	22 (30.1)			
Employment, n (%)							
Currently employed	9 (37.5)	17 (50.0)	7 (36.8)	33 (42.9)	2	0.02	0.58
Not employed	15 (62.5)	17 (50.0)	12 (63.2)	44 (57.1)			
Marital Status, n (%)							
Single/divorced	15 (62.5)	17 (50.0)	12 (63.2)	44 (57.1)	2	0.02	0.58
Married/living with partner	9 (37.5)	17 (50.0)	7 (36.8)	33 (42.9)			

[a]P-value from one-way ANOVA.

[b]P-value from Fisher's exact test.

Note: AUD = Alcohol use disorder; SD = Standard deviation.

Table 2

DERS subscale scores among participants with AUD by disorder(s), $N = 77$.

	AUD-0 ($n = 24$)	AUD-1 ($n = 34$)	AUD-2 ($n = 19$)					
	Mean (SD)	Mean (SD)	Mean (SD)	t^a	Adjusted P-value[a] comparing AUD-0 to AUD-2 (d.f.=41)	t^a	Adjusted P-value[a] comparing AUD-0 to AUD-1 (d.f.=56)
DERS							
Non-Acceptance	11.8 (5.1)	14.5 (5.6)	17.7 (5.9)	3.52	0.004	1.87	0.29
Aware	12.3 (3.2)	16.0 (4.6)	16.9 (5.6)	3.27[b]	0.007[b]	3.44	0.01
Clarity	10.1 (3.7)	11.6 (4.0)	13.1 (5.0)	2.27	0.042	1.43	0.47
Goal	13.0 (3.6)	14.4 (4.2)	17.9 (4.0)	4.25	0.001	1.30	0.47
Impulse	10.7 (5.3)	12.1 (4.9)	14.6 (5.6)	2.4	0.042	1.06	0.47
Strategy	18.0 (4.3)	20.5 (5.2)	23.8 (6.4)	3.59	0.004	1.93	0.29
Total	74.0 (20.5)	87.8 (22.5)	104.1 (22.5)	4.57	0.0003	2.39	0.12

[a] from Student's t-test pooled method

[b] from the Student's t-test Satterthwaite method for unequal variances, $d.f. = 29.1, 55.7, 34.5, 55.8$ consecutively

Note: DERS = Difficulties in Emotion Regulation Scale; AUD = Alcohol use disorder; SD = Standard deviation n P-values adjusted by Holm (1979) method

Table 3

Comparisons of alcohol-related variables among participants with AUD by disorder groups, N=77.

	AUD-0 (n = 24) Mean (SD)	AUD-1 (n = 34) Mean (SD)	AUD-2 (n = 19) Mean (SD)	t^a	Adjusted P-value[a] comparing AUD-0 to AUD-2 (d.f.=41)	t^a	Adjusted P-value[a] comparing AUD-0 to AUD-1 (d.f.=56)
Percent days abstinent	31.1 (27.3)	29.7 (27.5)	18.8 (21.0)	1.62	0.23	0.19	1.00
Drinks per drinking day	6.91 (3.00)	9.75 (5.80)	13.22 (11.45)	5.03	<0.0001	2.43[b]	0.11[b]
SADD	15.1 (6.6)	19.2 (7.8)	18.8 (6.2)	1.87	0.21	2.11	0.16
IDTS-A							
Pleasant emotions	45.6 (20.5)	42.2 (20.9)	51.9 (27.3)	0.88	0.38	0.61	1.00
Unpleasant emotions	59.9 (17.3)	72.5 (16.8)	80.2 (13.4)	4.22	0.0005	2.08	0.16
Conflict with others	32.8 (21.5)	47.1 (24.0)	65.4 (18.7)	5.23	<0.0001	2.33	0.12

[a] from Student's t-test pooled method

[b] from Student's t-test Satterthwaite method for unequal variances, d.f. = 20.0, 52.0 consecutively

Note: AUD = Alcohol use disorder; SADD = Short Alcohol Dependence Data; IDTS-A = Inventory of Drug Taking Situations – Alcohol Version P-values adjusted by Holm (1979) method

Table 4

Comparisons of high-risk drinking, affective, emotion regulation, mindfulness and psychological distress variables among participants with AUD by disorder(s), $n = 77$.

	AUD-0 (n=24)	AUD-1 (n=34)	AUD-2 (n=19)	t^a	Adjusted P-value^a comparing AUD-0 to AUD-2 (d.f.=41)	t^a	Adjusted P-value^a comparing AUD-0 to AUD-1 (d.f.=56)
	Mean (SD)	Mean (SD)	Mean (SD)				
PANAS Positive	36.0 (7.2)	29.9 (7.9)	32.7 (7.6)	1.45	0.464	2.98	0.092
PANAS Negative	14.5 (5.1)	18.9 (7.8)	20.7 (8.0)	2.96^b	0.061	2.64^b	0.210
NMRQ	102.3 (16.4)	95.4 (15.7)	91.4 (12.2)	2.43	0.137	1.63	0.983
DTS Absorption	3.43 (0.93)	2.86 (0.83)	2.32 (0.97)	3.82	0.009	2.43	0.313
DTS Appraisal	3.47 (0.66)	3.00 (0.74)	2.76 (0.86)	3.07	0.053	2.53	0.261
DTS Regulation	2.97 (1.12)	2.99 (0.68)	2.77 (0.96)	0.62	0.963	0.07^b	1.000
DTS Tolerance	3.17 (0.98)	2.92 (0.92)	2.51 (1.09)	2.09	0.257	0.97	1.000
DTS Total	3.26 (0.69)	2.94 (0.68)	2.59 (0.81)	2.92	0.062	1.74	0.983
TAS Describe feelings	12.4 (4.4)	12.9 (4.6)	14.8 (4.0)	1.87	0.343	0.42	1.000
TAS Externally-oriented thinking	19.0 (4.5)	20.5 (4.2)	21.7 (5.0)	1.86	0.343	1.30	1.000
TAS Identify feelings	14.6 (4.7)	16.9 (5.1)	19.5 (5.6)	3.07	0.053	1.73	0.983
TAS Total	46.0 (10.3)	50.3 (11.3)	56.0 (12.7)	2.84	0.063	1.48	1.000
MAAS	4.28 (0.77)	3.88 (0.95)	3.60 (0.90)	2.68	0.084	1.69	0.983
KIMS Describing	28.3 (6.7)	26.3 (7.5)	22.5 (6.2)	2.89	0.062	1.06	1.000
KIMS Accepting	28.9 (5.5)	26.8 (6.4)	23.8 (5.2)	3.12	0.050	1.31	1.00
KIMS Acting	33.5 (5.0)	30.3 (7.5)	28.0 (5.0)	3.53	0.020	1.94^b	0.771
KIMS Observing	40.0 (8.1)	33.1 (8.8)	38.1 (9.1)	0.71	0.963	3.03	0.089
KIMS Total	130.6 (15.7)	116.5 (18.8)	112.5 (16.1)	3.72	0.012	3.02	0.089
BSI Global Severity Index	0.69 (0.54)	1.07 (0.66)	1.30 (0.61)	3.47	0.022	2.29	0.381
BSI Positive Symptom Distress Index	1.49 (0.43)	1.75 (0.53)	2.00 (0.57)	3.36	0.029	1.94	0.771
BSI Positive Symptom Total	22.5 (12.2)	29.9 (11.1)	33.3 (9.0)	3.24	0.038	2.43	0.313

[a] from one-way ANOVA model

[a] from Students t-test pooled method

[b] from Student's t-test Satterthwaite method for unequal variances, d.f. = 29.1, 55.7, 34.8, 55.8 consecutively

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Note: AUD = Alcohol use disorder; LSMean = Least-squared mean; CI = confidence interval; IDTS-alcohol = Inventory of Drug Taking Situations; PANAS = Positive and Negative Affect Schedule; NMRQ = Negative Mood Regulation Expectancies Questionnaire; DTS = Distress Tolerance Scale; TAS = Toronto Alexithymia Scale; MAAS = Mindful Attention Awareness Scale; KIMS = Kentucky Inventory of Mindfulness Skills; BSI = Brief Symptom Inventory. P-values adjusted by Holm (1979) method