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Experiential avoidance, distress tolerance, and substance use cravings among adults in residential treatment for substance use disorders

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Abstract

Substance use cravings are a known predictor of relapse to substance use following treatment for a substance use disorder. Thus, research on factors that may be correlated with cravings, and could then be targeted in substance use treatment, is needed. Both distress tolerance and experiential avoidance, similar but distinct constructs, are independently associated with substance use cravings. However, no known research has examined these constructs as simultaneous predictors of substance use cravings, which may have important implications for treatment. The current study examined this in a sample of men and women in residential substance use treatment ($n = 117$). The authors used pre-existing data from a larger study where men and women were recruited for participation from a residential substance use treatment facility. The majority of the sample was male ($n = 87$; 74.3%) and Caucasian (92.2%). The mean age was 41.27 (standard deviation = 10.68). Better distress tolerance and lower experiential avoidance were negatively and significantly associated with alcohol and drug cravings, but only experiential avoidance remained significantly and negatively associated with cravings when both predictors were examined simultaneously. The current findings provide preliminary support for the importance of decreasing experiential avoidance in substance use treatment, which may result in reduced substance use cravings.

Keywords

Substance use; cravings; distress tolerance; experiential avoidance; treatment

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Conflict of interest

The first and last authors receive consulting compensation from Cornerstone of Recovery.

Introduction

Substance use disorders remain an endemic problem with high rates of relapse.¹ Although there are a number of risk factors for relapse following substance use treatment,^{2,3} cravings for substances are a robust risk factor for substance use relapse.^{4,5} Substance use craving is a multifaceted, difficult-to-define construct.⁶ For the present study, the authors define substance use cravings as “the subjective experience of an urge or desire to use substances” (p. 1563).⁷ Research on substance use cravings has shown that cravings can be experienced as, but are not limited to, an emotional state,⁸ physical sensations,⁹ intrusive thoughts,¹⁰ a feeling of “wanting,”¹¹ or a combination of these elements.

Experiential avoidance and distress tolerance, similar yet distinct constructs,¹² are both independently associated with substance use cravings. Experiential avoidance is defined as a phenomenon that occurs when a person is unwilling to remain in contact with particular private experiences (e.g., bodily sensations, emotions, thoughts, memories, images, behavioral predispositions) and takes steps to alter the form or frequency of these experiences or the contexts that occasion them, even when these forms of avoidance cause behavioral harm. (p. 554)¹³

The long-term consequences of experiential avoidance are severe and may include the development, maintenance, and exacerbation of a number of mental health disorders, including substance use.¹⁴

Distress tolerance can be defined as “the capacity to experience and withstand negative psychological states” (p. 83).¹⁵ Individuals with low distress tolerance are more likely to perceive their distress as unbearable or intolerable, be ashamed of their distress, believe they cannot cope with distress, and have difficulty regulating their distress once present.¹⁵ Researchers have conceptualized experiential avoidance as distinct from distress tolerance, as experiential avoidance aims to alter the form or frequency of aversive internal experiences, whereas distress tolerance is based on perceived or actual ability to withstand exposure to aversive stimuli.¹²

The few studies that examined the relation between experiential avoidance and cravings focused primarily on cigarette cravings and found high levels of experiential avoidance and poorer distress tolerance to be associated with increased cravings,¹⁶ and prior research demonstrates better distress tolerance to be associated negatively with drug cravings.¹⁷ However, researchers have yet to investigate experiential avoidance and distress tolerance as simultaneous predictors of alcohol and illicit drug use cravings. Given the potential implications of the current work for future research and for substance use treatment, it is imperative that researchers explore this gap in the literature.

The current study examined these constructs as simultaneous predictors of substance use cravings among adults in residential substance use treatment. It was hypothesized that greater experiential avoidance and poorer distress tolerance would be associated with increased substance use cravings (alcohol and drug) after controlling for substance use problems.

Method

Participants

Participants included 117 men and women who were in a 28–30-day residential substance use treatment program in the Southeastern United States. This sample has been reported on previously¹⁸ and was part of a larger randomized controlled trial. In order to meet inclusion criteria, individuals had to be 18 years of age or older and cleared by medical staff from substance use withdrawal. Exclusion criteria included screening positive for psychotic symptoms on the Psychiatric Diagnostic Screening Questionnaire,¹⁹ which was administered as part of the treatment facility's standard intake procedure, or if a physician determined they had cognitive impairments (e.g., dementia, Alzheimer's). The majority of the sample was male ($n = 87$; 74.3%) and Caucasian (92.2%). The remainder of the sample self-identified as African American (3.4%), Hispanic (1.7%), Asian American (1.7%), and Indian (0.9%). The mean age was 41.27 (standard deviation [SD] = 10.68) and the mean years of education completed was 14.19 (SD = 2.42). The primary substance use diagnoses were Alcohol dependence (58.1%), opioid dependence (17.1%), polysubstance dependence (14.5%), and "other" (10.3%; e.g., cocaine dependence).

Procedure

Participants were approached individually by research assistants to request participation in the current study. All participants were informed that their participation was voluntary and that all information they provided would be kept confidential from the treatment facility. Interested patients completed an informed consent and a packet of self-report measures. Participants received no monetary compensation. Of the 139 men and women screened for participation, 2 failed to meet inclusion criteria and 20 declined participation. After completion of the self-report questionnaires discussed in this manuscript, participants were randomized to receive treatment-as-usual (TAU) or TAU plus an adjunctive mindfulness and acceptance group (TAU+). TAU is based primarily on 12-step models of substance use (i.e., Alcohol/Narcotics Anonymous) and includes individual, group, and family/couples therapy. Analyses demonstrated no significant differences between participants in each group on the variables utilized in the present study¹⁸, and thus, the sample is combined for the current manuscript. Therefore, the current study represents secondary analysis of data from this previous study. Substance use diagnoses were based on *the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition—Text Revision* (DSM-IV-TR) criteria²⁰ and diagnoses were determined by the treatment facility. The present study received approval from the institutional review board.

Measures

Alcohol and drug cravings—The Penn Alcohol Craving Scale (PACS)²¹ was used to measure cravings. Consistent with prior research,²² the PACS was modified to also measure drug cravings. For both alcohol and drugs, five items asked about the intensity, frequency, and duration of cravings, and overall intensity of cravings during the past 7 days. All items were rated on a 6-point scale, and higher scores corresponded to higher cravings. The PACS was administered twice: once for alcohol ($\alpha = 0.95$) and once for drugs ($\alpha = 0.96$).

Alcohol and drug problems—The Short Inventory of Problems (SIP)²³ was used to assess problems related to participants' alcohol use. The SIP assesses 15 negative consequences of alcohol use that are rated on a 4-point scale. All items are summed, with higher scores corresponding to more frequent alcohol problems. Participants were asked to report on their alcohol problems for the 3-months prior to treatment entry. The internal consistency in the current study was 0.96.

Drug problems were assessed using the SIP modified for drug use.²⁴ Similar to the alcohol version, the drug version contains 15 negative consequences of drug use that are rated on the same 4-point scale. All items are summed, with higher scores corresponding to more frequent drug problems. Participants were asked to report on their drug problems for the 3-months prior to treatment entry. The internal consistency in the current study was 0.97.

Experiential avoidance—substance abuse—The 18-item Acceptance and Action Questionnaire, Substance Abuse version (AAQ-SA)²⁵ was used to measure experiential avoidance that was specific to substance use. An example item is "Memories of my substance use history make it difficult for me to live a life that I would value." Each item is rated on a 7-point scale and all items are summed to create a total score. The AAQ-SA assess two different dimensions of experiential avoidance: values commitment and defused acceptance. Higher scores reflect greater psychological flexibility, and thus also reflect lower levels of experiential avoidance that is specific to substance use urges, cravings, and thoughts. The AAQ-SA has demonstrated good psychometric properties.²⁵ The internal consistency in the current sample was 0.85.

Distress tolerance—The Distress Tolerance Scale¹⁵ was used to examine distress tolerance. The DTS is a 15-item self-report measure, with each item rating using a 5-point scale (1 = strongly agree; 5 = strongly disagree). Higher scores on the DTS correspond to a better ability to tolerate distress. A total score is obtained by summing all items. The DTS assess four different dimensions of distress tolerance: tolerance, absorption, appraisal, and regulation. The DTS has been found to have good psychometric properties.²⁶ The internal consistency in the current sample was 0.92.

Data analytic plan

First, it was confirmed that all study variables were normally distributed by inspecting kurtosis and skewness values. Bivariate correlations between study variables were calculated using Statistical Package for the Social Sciences (SPSS) version 23.0. Next, hierarchical regression analyses were performed. In the first step, alcohol problems/drug problems were entered as a predictor of alcohol/drug cravings. In the second step, distress tolerance and experiential avoidance were added to the model. This process was repeated for drug cravings with one change; for drug cravings, the age was entered into the first model due to its association with drug cravings.

Results

Alcohol cravings were negatively and significantly associated with experiential avoidance and all indicators of distress tolerance, demonstrating that lower levels of experiential

avoidance and higher levels of distress tolerance were associated with lower alcohol cravings (see Table 1). Drug cravings were also negatively and significantly associated with experiential avoidance, as well as the tolerance subscale of distress tolerance and age.

Results of the hierarchical regression analyses are presented in Table 2. First, for alcohol cravings, lower levels of experiential avoidance was negatively and significantly associated with alcohol cravings after controlling for alcohol problems and distress tolerance. Alcohol problems remained positively and significantly associated with alcohol cravings. Distress tolerance was not associated with alcohol cravings when accounting for experiential avoidance. Similar results were found when drug cravings were examined (see the Appendix). That is, lower levels of experiential avoidance were negatively and significantly associated with drug cravings after controlling for age, drug problems, and distress tolerance, whereas distress tolerance was not associated with drug cravings.^{1,2}

Discussion

The current findings demonstrate that experiential avoidance, specific to substance use, was negatively associated with alcohol and drug cravings after controlling for substance use and problems, as well as distress tolerance. The current study is the first to demonstrate that experiential avoidance is associated with substance use cravings even after accounting for distress tolerance, a theoretically and empirically similar, yet distinct, construct. Although the present findings were based on cross-sectional data, they provide interesting avenues for future research both on the course and nature of substance use cravings, as well as potential interventions for substance use.

Theoretically, experiential avoidance is associated with increased distress and increased avoidance of feelings or emotions.²⁷ It is not surprising that experiential avoidance would be inversely associated with substance use cravings, as attempts to avoid cravings may, ironically, increase cravings. Although the authors did not find distress tolerance to remain associated with cravings after accounting for experiential avoidance, some have conceptualized distress tolerance as one component of experiential avoidance.¹² Continued research is needed to differentiate these two constructs and their relations to cravings. It is also important to note that the measure of experiential avoidance in the current study was specific to substance use, whereas the current measure of distress tolerance was for general distress, and not substance use specific. Thus, it is plausible experiential avoidance was a stronger predictor due to the measure being specific to substance use. Future research should determine if findings are different if a substance use specific measure of distress tolerance is used.

Future research is needed to determine whether targeting experiential avoidance helps to reduce substance use cravings and, in turn, relapse. Acceptance and Commitment Therapy

¹Analyses were also conducted with the four distress tolerance subscales in place of the total distress tolerance score. Results were consistent with the models presented, in that none of the distress tolerance subscales were associated with alcohol or drug cravings when experiential avoidance was included in the models.

²The authors also conducted analyses with the two experiential avoidance subscales in place of the total experiential avoidance score. Results demonstrated both subscales were negatively and significantly associated with alcohol cravings, and the defused acceptance subscale was negatively and significantly associated with drug cravings.

(ACT)²⁷ and Mindfulness-Based Relapse Prevention (MBRP)²² are two interventions that have shown promise with substance use and, theoretically, should decrease experiential avoidance which, thereby, decreases cravings. Indeed, preliminary research shows MBRP reduces cravings,⁷ ACT decreases experiential avoidance,²⁸ and ACT can be beneficial for substance use.²⁹ Examining whether such interventions reduce substance use cravings through increased experiential avoidance is a necessary future step needed to elucidate mechanisms of change.

A number of limitations to the current study should be noted. First, structured diagnostic interviews were not conducted to determine substance use diagnoses, and instead were determined through consensus among treatment providers, and thus diagnostic accuracy cannot be firmly established. Second, the cross-sectional design does not allow for the determination of causality among study variables. Longitudinal research is needed to examine the temporal associations among study variables prior to and following treatment. Third, the present sample was comprised primarily of Caucasian men, which limits the generalizability of findings to more diverse samples. The relatively small sample size also precluded the examination of whether effects varied across different groups of patients (e.g., gender).

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Appendix

STROBE Statement—Checklist of items that should be included in reports of observational studies

	Item number	Recommendation
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract (p. 1 & 2) (b) Provide in the abstract an informative and balanced summary of what was done and what was found (p. 2)
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported (p. 3)
Objectives	3	State specific objectives, including any prespecified hypotheses (p. 4)
Methods		
Study design	4	Present key elements of study design early in the article (p. 5)
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection (p. 5)
Participants	6	(a) <i>Cohort study</i> —Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up. (b) <i>Case-control study</i> —Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls.

	Item number	Recommendation
		<i>Cross-sectional study</i> —Give the eligibility criteria, and the sources and methods of selection of participants (p. 4 & 5) <i>(b) Cohort study</i> —For matched studies, give matching criteria and number of exposed and unexposed. <i>Case-control study</i> —For matched studies, give matching criteria and the number of controls per case.
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable (p. 6 & 7)
Data sources/measurement	8 *	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group (p. 6 & 7)
Bias	9	Describe any efforts to address potential sources of bias (n/a)
Study size	10	Explain how the study size was arrived at (n/a)
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why (p. 7)
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding (p. 7) (b) Describe any methods used to examine subgroups and interactions (n/a) (c) Explain how missing data were addressed (n/a) (d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed (e) <i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed (f) <i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy (n/a) (g) Describe any sensitivity analyses (n/a)
Results		
Participants	13 *	(a) Report numbers of individuals at each stage of study—eg. numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analyzed (p. 4) (b) Give reasons for nonparticipation at each stage (n/a) (c) Consider use of a flow diagram (n/a)
Descriptive data	14 *	(a) Give characteristics of study participants (e.g., demographic, clinical, social) and information on exposures and potential confounders (p. 4 & 5) (b) Indicate number of participants with missing data for each variable of interest (n/a) (c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount)
Outcome data	15 *	<i>Cohort study</i> —Report numbers of outcome events or summary measures over time <i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure <i>Cross-sectional study</i> —Report numbers of outcome events or summary measures (p. 8)
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g., 95% confidence interval). Make clear which confounders were adjusted for and why they were included (p. 8) (b) Report category boundaries when continuous variables were categorized (n/a) (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period (n/a)
Other analyses	17	Report other analyses done—e.g., analyses of subgroups and interactions, and sensitivity analyses (p. 11)
Discussion		
Key results	18	Summarize key results with reference to study objectives (p. 8)

	Item number	Recommendation
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias (p. 9 & 10)
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence (p. 8 & 9)
Generalizability Other information	21	Discuss the generalisability (external validity) of the study results (p. 10)
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based (p. 13)

* Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An explanation and elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the websites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Table 1.

Bivariate correlations, means, and standard deviations among study variables in men and women in substance use treatment ($N = 117$).

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Age	—	0.08	-0.01	-0.28**	0.12	-0.30**	0.12	0.10	0.20*	0.01	0.01	0.08
2. Gender		—	0.15	0.18	0.11	0.04	-0.21*	-0.16	-0.27**	-0.28**	-0.19*	-0.28**
3. Alcohol cravings			—	0.11	0.56***	-0.11	-0.48***	-0.24*	-0.23*	-0.28**	-0.27**	-0.31**
4. Drug cravings				—	-0.14	0.64***	-0.48***	-0.21*	-0.18	-0.19	0.05	-0.17
5. Alcohol problems					—	-0.19	-0.32**	-0.22*	-0.28**	-0.27**	-0.30**	-0.32**
6. Drug problems						—	-0.44***	-0.28**	-0.22*	-0.16	0.05	-0.18
7. Experiential avoidance							—	0.54***	0.48***	0.51***	0.29**	0.54***
8. DTS—Tolerance								—	0.76***	0.67***	0.53***	0.85***
9. DTS—Absorption									—	0.74***	0.55***	0.89***
10. DTS—Appraisal										—	0.56***	0.91**
11. DTS—Regulation											—	0.73***
12. DTS—Total												—
<i>M</i>	41.27	1.26	7.87	8.34	19.92	19.34	82.06	9.41	9.50	19.00	9.19	47.17
<i>SD</i>	10.68	0.44	8.78	9.23	14.89	16.64	17.17	3.28	3.59	5.89	2.89	13.54

Note: DTS: distress tolerance scale.

Gender was coded 1: male and 2: female.

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$.

Table 2.

Hierarchical regression analyses predicting substance use cravings.

	Alcohol cravings β (SE)	Drug cravings β (SE)
Model 1	$F = 40.39^{***}; R^2 = 0.29$	$F = 28.10^{***}; R^2 = 0.42$
Substance use problems	0.54 (0.05) ^{***}	0.62 (0.05) ^{***}
Age	—	-0.09 (0.08)
Model 2	$F = 21.93^{***} (F = 9.23^{***}); R^2 = 0.41 (R^2 = 0.12)$	$F = 17.09^{***} (F = 3.95^*); R^2 = .47 (R^2 = .05)$
Substance use problems	0.43 (0.05) ^{***}	0.51 (0.05) ^{***}
Age	—	-0.06 (0.08)
Distress tolerance	0.02 (0.06)	0.10(0.06)
Experiential avoidance	-0.37 (0.05) ^{***}	-0.30 (0.06) ^{**}

Note: Substance use problems = alcohol problems in the alcohol craving model; drug problems in the drug craving model.

*
 $p < 0.05$,

**
 $p < 0.01$,

 $p < 0.001$.