Substance Use Disorder and Mindfulness-Based Relapse Prevention in a Residential Treatment Center

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Abstract

Purpose: The purpose of this study was to examine the usefulness of Mindfulness-Based Relapse Prevention in reducing cravings in adults with Substance Use Disorder (SUD), living in a residential treatment center.

Research Question: Does Mindfulness-Based Relapse Prevention (MBRP) reduce cravings for substance use in a residential treatment center?

Setting/Sample: An adult residential treatment center in Delaware was the setting for recruitment of a convenience sample (N=14) of ten men and four women aged 18-24 years old with SUD.

Measures: Data was collected on age, gender, race and Brief Substance Craving Scale (BSCS) scores, pre and post intervention. The BSCS was used to assess the frequency, intensity, duration of craving, and overall rating of craving.

Design/Methods: A single group pre-test/post-test design was used to answer the research question. The Wilcoxon Signed-Rank Test and the Sign Test were used to compare differences in ordinal data on this small sample size.

Procedures: An established MBRP protocol was implemented.

Results: There was a significant reduction in subjects reports on all measures of the BSCS pre-test to post-test. Composite scores of the three ordinal measurements decreased (M = 6.14 to M=2.00) as well as overall craving (M=5.29 to M=0.86).

Nursing Implications: The findings support the use of MBRP in residential treatment as an added treatment modality for young adults with SUD to reducing cravings that lead to relapse.

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Overview of Problem

Substance use disorder (SUD) is a complex and serious problem requiring committed treatment and diligent attention to relapse prevention (Abuse, 2010). Relapse prevention is based on principles that seek to address the problem of relapse in SUD by developing self-control strategies. While relapse prevention implies exclusive focus on the prevention of relapse after abstinence is initiated, it actually encompasses several strategies intended to facilitate abstinence. A variety of techniques can be used to enhance self-control through the identification of high risk situations for relapse and in the implementation of more effective coping strategies. Specific techniques to enhance abstinence from substance use are aimed at exploring positive and negative consequences of continued use, self-monitoring to identify high-risk situations for relapse, and the development of strategies for coping with cravings (Marlatt & Gordon, 2008).

Research results on meditation show that mindfulness-based interventions effectively treat issues such as depression, autoimmune diseases and post-traumatic stress order (Kabat-Zinn, 2014).. Mindfulness-based relapse prevention (MBRP), is an eight-week program developed at the University of Washington, which is modeled after other mindfulness-based treatments (Bowen, Chawla & Marlatt, 2011). MBRP tackles the roots of addictive behavior by targeting two of the main predictors of relapse: negative emotions and cravings. Treatment centers, prisons and Veterans Affairs centers across the country have implemented the program. Studies of MBRP have generally found it to be effective in promoting long-term abstinence by enhancing ones' self-efficacy, self-

awareness and ability to deal with drug cravings that are correlated with relapse (Bowen, Chawla & Marlatt, 2011).

Purpose

The purpose of this project was to examine the usefulness of MBRP to reduce drug craving, which is a predictor of drug relapse.

The Problem

There is a broad base of information on the topic of SUD as a social and economic problem that costs millions of dollars and tens of thousands of lives. Generally speaking, SUD refers to the abuse of, or reliance on, psychoactive substances that are detrimental to the person's physical and psychological wellness, or the welfare of others (American Psychiatric Association, 2013). Substance dependency is determined when an individual persists in use of alcohol or other drugs despite problems related to use of the substance. Compulsive and repetitive use may result in tolerance to the effect of the drug and withdrawal symptoms when use is reduced or stopped; this, along with substance abuse is considered SUD (American Psychiatric Association, 2013). Contemporary treatment approaches are aimed at helping individuals develop insight, relapse prevention skills and foster coping skills to deal with day-to-day stressors that lead to drug use (Dutra, et al., 2008).

Substance Use Disorder

SUD is characterized by overuse or dependence on a drug, which negatively affects one mentally, physically and socially. The American Psychiatric Association (2013) further defines SUD in terms of ones' inability to meet life responsibilities at work or home, high risk taking without consideration for safety and a disregard for the legal

consequences of drug use (2013). In spite of any adverse mental, physical, social or legal consequences related drug use, an individual with SUD will continue to use drugs (Longe, 2006). According to the Substance Abuse and Mental Health Services Administration (SAMHSA), SUD has been on the rise over the last decade. In the United States in 2014 an estimated 176 million people were regular alcohol users, 17 million had alcoholic SUD and 88,000 deaths were associated with alcohol. Comparatively in that same year, 22.2 million had marijuana SUD, 913,000 had amphetamine/cocaine SUD, 246,000 had hallucinogenic SUD and 1.9 million people had opiate SUD. Overdose deaths from opioids in 2011 were approximately 17,000, which is a staggering 265% increase among men and 400% increase among women since 1999 ("Substance Abuse Disorders," 2015). Although treatment options are available only 11% of those who need SUD treatment actually gain entrance into a specialty facility for the exclusive purpose of addressing their drug problem (Abuse, 2010). Treatments approaches for SUD are typically provided through various psychosocial modalities.

Contemporary Treatment Approaches

Psychosocial treatment approaches for SUD have evolved over the past few decades, however in spite of the advances of various modalities, research regarding the successful outcomes of these measures has not been well documented (Dutra, et al., 2008). Contingency management therapy is one approach, which is based on the principle that behaviors that are followed by a reward are likely to be repeated. Methadone treatment programs for opiate dependency and voucher-based programs are such examples whereby consumers are given rewards contingent upon their abstinence (Stitzer, Bickel, Begelow & Liebson, 1986; Budney & Higgins, 1998). Motivational

interviewing is another treatment approach that is aimed at promoting insight in order to change one's automatic responses, thus enhancing awareness of their problems, which leads to a sense of autonomy, freedom and control (Resnicow & Rollnick, 2011). However, empirical support for motivational interviewing for SUD has not been substantial (Miller, Yahne & Tonigan, 2003; Donovan, et al., 2001; Booth, et al., 1998).

A robust treatment approach that is more prevalent in the literature has been the cognitive behavioral therapies used in relapse prevention (Rawson et al., 2004; Marlatt & Donovan, 2008; Dutra et al., 2008). Relapse prevention skills aid a person to subjectively analyze their drug use behavior and behavioral antecedents to relapse. The objective of this treatment is to increase insight and awareness about negative thought processes, cravings and the consequences of drug use, thereby avoiding relapse. One learns to recognize triggers and avoid high-risk situations that lead to relapse by being able to employ behavioral and cognitive strategies for coping with cravings which are a strongly correlated with relapse (Marlatt & Donovan, 2008). Cognitive behavioral interventions have been found to be most effective when they are a part of a multimodal treatment agenda that combines group therapy, individual therapy, educational groups, motivational interviewing and meditative practices (Rawson, et al., 2004; Miller & Rollnick, 2000).

Conversely, in a meta-analytic review regarding the efficacy of psychosocial interventions, Dutra and colleagues (2008) examined 34 studies that utilized various treatment approaches and only five studies focused on relapse prevention as a strategy for successful rehabilitation. One-third of the 2,340 subjects that entered into any of the treatment studies achieved any significant post-treatment abstinence and the other two-thirds dropped out for reasons that mainly included relapse. In the five relapse

prevention studies, there was 57% dropout rate, which lends one to conclude that retaining subjects in research is problematic due to relapse. Therefore, the development and proliferation of relapse prevention programs have come into existence in order to counter the automatic and mindless compulsion leading to continued drug use.

Relapse Prevention Approach

The relapse prevention model (Marlatt & George, 1984) is an approach to altering excessive or addictive behavior patterns and on maintaining abstinence from substance use following formal treatment. Relapse prevention suggests that immediate determinants such as high-risk situations, coping skills, outcome expectancies and the violation of abstinence and/or covert antecedents such as lifestyle factors, urges and cravings can contribute to relapse (Larimer, Palmer & Marlatt, 1999). Relapse is thus viewed as a transitional process in which a series of events may be followed by a return to pretreatment substance use (Marlatt & George, 1984). The relapse prevention approach provides an individual with skills and cognitive strategies to manage cravings and prevent the single occurrence of a lapse from snowballing into a total relapse. Rather than looking pessimistically upon a relapse as a dead end, the relapse prevention approach views it as a fork in the road, with one path returning to the former problem behavior and the other continuing in the direction of positive change (Marlatt & Donovan, 2008).

Specific interventions include: identifying an individual's high-risk situations and enhancing skills for coping with those situations, increasing self-efficacy, eliminating myths regarding substance use, managing lapses, and restructuring perceptions of the relapse process. Other strategies comprise employing stimulus control techniques,

craving/urge management techniques, and developing relapse road maps to visualize the consequences of any intended drug use (Larimer, Palmer & Marlatt, 1999). Relapse prevention is a psycho-educational program that combines behavioral skill training with cognitive intervention techniques in order to recognize antecedent thoughts and behaviors and utilize coping skills to intuitively avoid substance use by managing automatic responses to cravings (Marlatt & Donovan, 2008). MBRP is a specific treatment modality that blends the relapse prevention approach with mindfulness meditation.

Literature Review

A literature review was conducted to provide the background for which the following research question may be answered: Does a Mindfulness-Based Relapse Prevention program reduce cravings in adults with SUD?

The methods used in compiling the literature review were comprised using the following databases: OVID MEDLINE, CINAHL, PubMed and Google Scholar. Search terms included: Substance use disorder, mindfulness-based relapse prevention, relapse prevention, behavioral therapies substance use disorder, relapse prevention, cravings and relapse. MBRP articles were chosen that had a narrow focus on the relationship between craving and relapse as well as articles that compared MBRP to treatment as usual (TAU). Randomized controlled trials and meta-analyses substantiating MBRP were also included. In addition to this summary of the review, article synopses are presented in Table 3.

Mindfulness-Based Relapse Prevention

Relapse chronically occurs following substance abuse treatment, highlighting the need for improved aftercare approaches. MBRP is just such a group-based type of

aftercare that adapts evidence-based practices from other mindfulness-based interventions and cognitive-behavioral therapies. MBRP is a specific orientation that has evolved out of Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT). Mindfulness has been described as paying attention in a particular way, on purpose in the present moment and without judgment (Kabat-Zinn, 2014). Theoretical foundations have been blended using mindfulness techniques with traditional cognitive relapse prevention models and have emerged in an effective and useful treatment for relapse prevention in SUD (Teasdale, et al., 2000). Participants of MBRP are trained to identify high-risk situations and to increase their awareness of internal and external cues/warning signs that are associated with substance use. This awareness culminates in the development of effective coping skills and an enhancement of self-efficacy. MBRP is intended to raise awareness of triggers, cravings and drug use, monitor internal reaction and foster better behavioral choices. Effectively, participants are more accepting and tolerant of positive and negative, physical, emotional and cognitive states, such as craving, thus decreasing or eliminating their compulsion to use (Bowen, et al., 2009).

In a pilot study to evaluate the feasibility and efficacy of an MBRP, 168 subjects were randomized to an 8-week MBRP program and TAU (i.e. educational and cognitive therapy) group. Participants reported lower cravings, had significantly fewer relapses and had reported increases in acceptance of whom and where they were in life compared to the TAU group (Bowen, et al., 2009). In a similar pilot study, researchers adapted MBRP from MBSR and MBCT and discussed the effective outcome, which was a more tailored program that was met with positive outcomes of decrease rates of relapse

(Vallejo and Amaro, 2009). There have been strong correlations between craving and substance abuse relapse. Witkiewitz and Bowen (2010) found MBRP to be beneficial in moderating participants craving for substance use versus a TAU group. This moderation effect predicted 73% of the sample maintaining abstinence at the four-month follow up.

Bowen et al., (2014) randomly assigned 286 adults, who completed treatment for SUD at an inpatient facility, into MBRP, relapse prevention and TAU for 8 weekly group sessions. Outcomes measured were self-reports of relapse, craving and urine drug and alcohol screenings at 90-days, 6-months and 12-months. Participants who were assigned to MBRP had significantly lower risk of relapse to substance use and heavy drinking than those in the TAU group. At the 12-month follow up, MBRP participants reported significantly fewer days of substance use compared to those in the TAU groups

In a review of literature on MBRP, Witkiewitz, Lustyk and Bowen (2016), theorized that areas of the brain associated with craving and negative affective reasoning are inextricably intertwined and when set in motion will culminate in relapse. Witkiewitz, Lustyk and Bowen (2016) hypothesize how MBRP may affect these and other areas of the brain and may reverse, repair or compensate for neurological changes associated with addiction and relapse. Through this extensive survey, Witkiewitz, Lustyk and Bowen (2016) present plausible reasons regarding how MBRP is effective through a vast review of the biological basis of substance use, reward pathways, logical relationships between brain pathways and the structural neurological changes that happen as evidenced by correlative neuro-imaging. Furthermore, meta-analytic results revealed significant small-to-large effects of mindfulness treatments in reducing the frequency and severity of

substance misuse, intensity of craving for psychoactive substances, and severity of stress (Li, et al., 2017).

Cravings

There is a positive correlation between craving and relapse in many of the studies reported. Craving is defined as the subjective experience of an urge to use substances and has been identified in clinical, laboratory and preclinical studies as a significant predictor of SUD and relapse following treatment. Researchers have outlined craving as a core feature of SUD that drives the compulsion to use substances and it has been generally accepted as a salient predictive factor in relapse (Witkiewitz, Bowen, Douglas & Hsu, 2013; Hartz, Frederick-Osborne & Galloway, 2001). Craving has been outlined throughout the literature as a predictable antecedent in relapse across different types of substances, different types of treatment settings, across the lifespan and across different cultures. A growing body of experimental research on MBRP has consistently correlated significant decreases in cravings with decreases in relapse. (Bowen, et al., 2017; Grow, Collins, Harrop & Marlatt, 2015; Garland, Gaylord, Boettiger & Howard, 2010; Zgierska, et al., 2008; Li, et al., 2017, Carpentier, Romo, Bouthillon-Heitzmann & Limosin, 2015; Chiesa & Serretti, 2013; Ardame, Bassaknejad, Zargard, Rokni & Sayyah, 2014; Witkiewitz, Greenfield & Bowen, 2013; Witkiewitz, Bowen, Douglas & Hsu, 2013; Bowen, et al., 2009; Bowen, et al., 2014; Witkiewitz, Lustyk & Bowen, 2013; Larimer, Palmer & Marlatt, 1999).

Gaps in the Literature

Research on MBRP has not been widely replicated. More effective programs are needed to treat SUD These programs must have clinical utility, economic feasibility and

be easily adaptable to other modes of treatment currently being used in different levels of treatment. MBRP is one program that could be easily adapted with little cost to implement and is an effective treatment that decreases the incidence relapse. MBRP involves identifying subjective precursors to relapse, teaching meditation practices to increase awareness and change automatic responses to emotional, cognitive and physical discomfort arising from craving by providing skills to tolerate these states (Bowen, et al., 2014). Researchers have identified the effects of MBRP using different tools to measure relapse outcomes of subjects following MBRP.

However, within the scope of this literature review, there were few studies that examined the effect that MBRP had on reducing subjective cravings, that as mentioned, is highly correlated with relapse (Ardame, Bassaknejad, Zargard, Rokni ~~and~~ & Sayyah, 2014; Witkiewitz, Bowen, Douglas & Hsu, 2013). Gaps also exist regarding the implementation of MBRP in residential treatment centers and with minorities. Similarly, while MBRP studies have included a wide age range of subjects, no studies were found that exclusively focused on 18-24, year-olds, who have a higher incidence of SUD. Finally, although many studies have been conducted validating MBRP's treatment utility, further study in diverse settings is needed.

Theoretical Framework

The cognitive behavioral (CB) model for relapse developed by Larimer, Palmer and Marlatt (1999) was the most appropriate framework and is conceptualized in Figure 1. This model is based on the linear progression of responses to high-risk situations. If an effective coping strategy is used, then the individual will experience an increase in self-efficacy and is less likely to consume the desired substance. However, if an

ineffective coping strategy is used, then self-efficacy may decline, positive outcomes may become less, leading to an increased chance of drug use. The initial use of a substance (lapse) is followed by the effects of the substance and the attributions a person makes following a lapse; that is if the perception is that they have only made a minor mistake, they may likely return to their pre-relapse treatment goal (a prolapse). However, if they view the relapse as uncontrollable, internal indication of failure, they will more likely progress to continued use or relapse. This latter scenario is known as the abstinence violation effect whereby the lapse is viewed as an irreparable failure, which thus leads to an increase in the undesired behavior (Larimer, Palmer & Marlatt, 1999).

Purpose of the Study

The purpose of this study was to evaluate the effectiveness the MBRP program in reducing relapse potential by measuring the intensity, frequency, length and number of times participants spend craving substances pre and post intervention.

Methods

As previously stated, MBRP has been established as an effective modality at reducing relapse by activating an awareness of personal triggers and habitual reactions that lead to drug use. Craving is a trigger correlated to the habitual reaction of relapse and while MBRP studies have measured multiple constructs related to relapse including self-efficacy and personal awareness, exclusive measurements of craving following this intervention have not been widely studied. Furthermore, there is no research on the effect of MBRP in a residential treatment for adults between the ages of 18-24.

Hypothesis

Participants who engage in the MBRP program will report a reduction in drug craving after the 8-week period compared to the start of the program.

Definition of Terms

Mindfulness-Based Relapse Prevention (MBRP). Treatment for preventing relapse in SUD that integrates mindfulness meditation with relapse prevention practices. It is based in principles of self-compassion and acceptance of all experiences including cravings and urges.

Craving. The desire for more of a substance or activity (for example, drug of abuse, sex) consisting of a desire to experience the euphoric (or other) effects, as well as the desire to avoid the withdrawal aspects of abstinence.

Brief Substance Craving Scale (BSCS). A 16-item, self-report instrument that assesses craving for substances of abuse over a 24-hour period. Intensity and frequency of craving are recorded on a five-point Likert scale. The BSCS takes approximately 10 minutes; it can be used at intake, during treatment, and at follow-up.

Substance Use Disorder (SUD). A disorder involving problematic use of a drug, alcohol, or another substance, characterized by symptoms such as excessive use of the substance, difficulty limiting its use, craving, impaired social and interpersonal functioning, a need for increased amounts of the substance to achieve the same effects, and withdrawal symptoms upon discontinuance.

Research Design

This quantitative project assessed whether implementation of an 8 session MBRP program in a residential treatment setting when added to TAU will decrease drug

cravings in this 18-24 year old population. A quasi-experimental pretest-posttest design was used to address the study question.

Study Variables

Independent Variable: Participation in the MBRP program.

Dependent Variable: Self-reported craving level as measured by the Brief Substance Craving Scale (BSCS).

Sample and Recruitment

In this residential program, a convenience sample of 14 participants between the ages of 18-24 who were engaged in treatment and had no less than 8 weeks prior to discharge were recruited into the study. A formal meeting amongst the potential participants was organized to explain the MBRP treatment study, how it may benefit them and what was expected of them.

Inclusion criteria. Residents between the ages of 18-24 with a diagnosis of SUD who were engaged in the residential treatment program were invited to participate in the study so long as they were able to read or were able to be assisted in reading and comprehend English.

Exclusion criteria. Residents with serious and persistent mental illness, organic brain syndromes, developmental disabilities, diagnoses of schizophrenia, dissociative, psychotic or delusional disorders are under 18 or over 24 years of age, and/or could not read were excluded from the study.

Demographics

Descriptive statistics for the demographic variables were computed: frequency and percent for age, gender, and race (Table 1). Fourteen subjects were enrolled and their

ages ranged from 20-24 years with 64.3% aged 24, 21.4% aged 20 and 7.1% aged 22 and 23 respectively. Males outnumbered females 71.4% to 28.6%. Ethnic distribution was primarily White non-Hispanic 71.4%, and 14.3% African American and Hispanic respectively.

Setting

This was a single-site study conducted in a residential program for young adults with SUD located in the middle US Atlantic coast. This residential program is one of 150 SUD programs owned by the same corporation and provides treatment to 20,000 men, women and teenagers throughout Pennsylvania, Maryland and Delaware and is accredited by the Commission on Accreditation of Rehabilitation Facilities. The company that operates this residential program offers a multitude of SUD services for adults, adolescents, women with children, homeless individuals, co-occurring mental health disorders and persons with HIV. Programs include long and short-term residential treatment programs, partial hospitalization, intensive outpatient and traditional outpatient treatment, diversified prevention programs, criminal justice programs and transitional drug-free housing ("Drug and Alcohol", 2017).

The residential program is committed to helping individuals and families affected by SUD achieve a better quality of life through a continuum of care that is guided by a philosophy of mutual concern, personal responsibility, community education and the utilization of evidence based research. The researcher coordinated the study with the support of the practice mentor who is the Director of Health Services. The administration and the clinical staff at the Fresh Start program endorsed their support for this study.

Procedures

Data was collected on measures of the participants' substance craving prior to and at the end of the eight-week standardized MBRP program. After IRB approval and informed consent were obtained, the participants engaged in eight sessions of the Mindfulness-Based Relapse Prevention program officiated by the researcher who was assisted by the program director. Participants were given a general orientation into the MBRP program, its philosophy, the general tenets as well the aims of the program. Pre-test BSCS questionnaires were obtained prior to the programs implementation and collected on the same day by a volunteer participant and placed in a manila envelope before being given to the researcher.

The MBRP program followed *Mindfulness-Based Relapse Prevention for Addictive Behaviors: A Clinicians Guide*, which provides a specific outline to the evidence-based program as reported by Bowen, Chawla and Marlatt (2011). Eight, two hour sessions occurred one time per week for eight weeks. The first session provided an introduction to the practice of MBRP and the body scan technique. The second and remaining sessions were sequenced in order to teach subjects to pay attention and move through negative thoughts, emotions and cravings without assigning judgment to them. The MBRP intervention and the pre and post-test data collection began after IRB approval in October, 2017 and finished in December, 2017. Data calculations, statistical analysis and final reporting were completed between January and March, 2018.

Measures

Demographic information was collected regarding the participants age, gender and ethnicity (Table 1) and recorded on the BSCS. The BSCS is a 4-item, self-report

instrument that assesses craving for substances of abuse over a 24-hour period. Intensity, frequency, and length of cravings are recorded on a five-point Likert scale. The actual number of times participants had cravings were also reported (see Appendix B). The BSCS takes approximately 10 minutes; it can be used at intake, during treatment, and at follow-up. The BSCS was selected over other similar rating scales that only seek to measure cravings for specific substances of abuse rather than capturing cravings for all substances. The BSCS questionnaire preserves anonymity of participants by identifying patients as numbers instead of names.

Reliability

The Craving Subcommittee of the NIDA Medications Development Research Units (MDRU) designed the BSCS as an expansion of the Cincinnati Craving Scale. Reliability data for this instrument has been collected and validated at the Cincinnati MDRU (Mazza, Conrad, Scott & Dennis, 2014). There is confirmation of good test-retest reliability and Cronbach's alpha = 0.91 for the BSCS (Somoza et al., 1995; Dackis et al., 2004). The present study had strong internal-reliability (Pre-test: Cronbach's alpha = 0.85; Post-test: Cronbach's alpha = 0.91).

Data Analysis Plan

Data included demographic information on subjects and self-reported responses on the BSCS questionnaire. Data was entered into the statistical software package SPSS using descriptive statistics to summarize the participant's level of craving within the different parameters of the questionnaire. A nonparametric test was used to determine the differences between the pre and posttest data. The BSCS provides ordinal data on a Likert scale for the various subscale data. Due to the small sample size, a normal

distribution of the total sample could not be assumed, therefore the Wilcoxon-Signed Rank Test and Sign Test were used because it does not require the assumption of a normal distribution and are considered as efficient as a t-test on normally distributed samples (Cohen, 1988). A one-tailed directional test was utilized to test the hypothesis.

Protection of Human Subjects

This study received IRB for Health Science Research approval from the University of Virginia. To maintain confidentiality, there was no personal identifying information on questionnaires; computerized and statistical data do not contain names or personal identifying information. Each subject was assigned a number next to their first name on a ledger which was kept private by the researcher. Pre-test and post-test BSCS questionnaires were collected at the start and the completion of the program by a volunteer subject and placed in a manila envelope before being given to the researcher. Data sheets were kept in a locked briefcase with a combination known only to the researcher. Specific risks were not identified in any of the research regarding MBRP. No untoward effects to human subjects were reported.

Subjects received explanations about the expectations of the study and signed an informed consent (Appendix C) prior to the start of the study and they all understood that their involvement in the study was voluntary; they were reminded of this at every session. The researcher assured that all subjects understood the facets of the program the implications of their participation. There were no questions regarding a participants' capacity for autonomy or self-determination.

Data Analysis and Statistical Methodology

In order to measure the efficacy of the treatment program, responses to the four items of the BSCS were recorded before (pre-test) and after (post-test) the 8-week treatment program. As such, pre-test and post-test responses will be compared. All analyses were conducted with IBM SPSS Statistics version 24. Also, significance for all tests will be set at the $\alpha = 0.05$ level of significance. Research in the social science has relied on the conventional $p = .05$ level of statistical significance since the mid-20th century (e.g. Fisher, 1950). In instances in which $p < .05$, smaller probabilities will be reported, and the null hypothesis will be rejected.

In order to evaluate the effect of the program, the pre-post change scores for each of the 4 BSCS items were analyzed separately. Additionally, a composite score of the first three BSCS items was analyzed. The small sample size meant that paired-sample t-tests could not be used for the analyses unless the distributions of the pre-post difference scores were close to normal. In cases of non-normality, the nonparametric related-samples analyses, the Wilcoxon Signed Rank tests and Sign tests, were conducted.

Statistical Methodology

Three items on the BSCS were ordinal variables measured via Likert-type scales from 0 to 4. These items measured the intensity, frequency, and length of time spent craving in the past 24 hours; with scores of 0 indicating no cravings in the past 24 hours and scores of 4 indicating "extreme intensity" of cravings, "almost constant cravings", and "very long" length of time spent craving in the past 24 hours. These items were analyzed separately to determine whether the 8-week treatment program was associated with changed in these individual components of cravings. Additionally, a composite

score was created by summing participant responses to each of these items in order to measure the potential effect of the treatment program on overall cravings. The fourth BSCS item, the actual number of cravings in the past 24 hours, was also measured. This item was measured separately, as it was measured as a ratio variable and not on the same ordinal scale as the other three BSCS items.

The paired-samples t-test assumes that the pre-post differences are normally distributed. The Shapiro-Wilk test of normality was applied to the pre-post differences of the four BSCS items and to the pre-post composite score. There was strong evidence against normality for the pre-post differences in frequency of cravings in the last 24 hours and in the number of cravings in the last 24 hours ($p \leq .02$), as well as some evidence against normality for the pre-post differences in the length of cravings in the last 24 hours ($p = .079$). There was no strong evidence against normality for the intensity of cravings in the last 24 hours (Shapiro-Wilk Statistic = .918, $p = .205$), nor for the pre-post differences in the composite score (Shapiro-Wilk Statistic = .949, $p = .548$).

Because of the mixed results concerning the normality of the pre-post differences, in order to test the research hypothesis that the 8-week program reduces craving, the Wilcoxon Signed-Rank Test was investigated for all four BSCS differences, as well as the composite variable combining the intensity, frequency and length of cravings variables.

Similar to the paired-samples t-test, the Wilcoxon signed-rank test has three statistical assumptions that must be accounted for in order to obtain a valid result. The first assumption is that the dependent variable is measured on an ordinal or continuous scale. All of the measures in the study complied with that assumption. The second

assumption is that the independent variable consists of related groups, meaning that the same participant was measured on the same variable on two separate occasions (i.e. the same assumption as the paired samples t-test). The final assumption is that the distribution of the difference scores between the two levels of the independent variable (i.e. pre-test and post-test) was symmetrical in shape. To test this assumption, the frequency distributions were analyzed for each BSCS item. Additionally, the skewness value for the difference scores for each BSCS item was also examined. Based on examination of the histograms, the Shapiro-Wilk results, and the skewness values, the pre-post differences for intensity, length of craving, and the composite score were judged to be sufficiently symmetric, and the Wilcoxon signed-rank test was used to test the significance of the pre-post changes for those three items. The differences for the frequency and total number of cravings were judged to be somewhat asymmetric, and the Sign Test was used to test the significance of the pre-post changes for those two items.

Results

The purpose of this research was to examine the efficacy of an 8-week MBRP program on the reduction of drug cravings. Self-reported craving intensity, frequency, length of craving, and actual number of cravings in the last 24 hours were measured prior to and following the MBRP treatment program. Results to the analyses pertaining to each of the four aspects (BSCS items) of cravings were analyzed and reported separately. Additionally, a composite score of three BSCS items that can be combined was analyzed. The research hypothesis posits that the MBRP program effectively reduces the intensity, frequency, length and number of cravings. The null hypothesis states that there is no difference in the intensity, frequency, length, and number of cravings from pre-test to

post-test. Results pertaining to each specific component of cravings were reported first, followed by results pertaining to the combined overall cravings measure (i.e. the composite variable including three BCSC questions).

To test whether the intensity of cravings was lower after completing the 8-week mindfulness program, a Wilcoxon signed-rank test was conducted to compare participants responses to the intensity of cravings in the past 24 hours prior to (pre-test) and following (post-test) the program. There was a statistically significant change from before the 8-week mindfulness program to after it, in the intensity of cravings in the past 24 hours (Z = -2.788, p = .005). Additionally, the average craving intensity at post-test was lower (M = 0.64, SD = 0.93; 0 = "not at all intense", 1 = "slightly intense") than the average craving intensity of pre-test (M = 2.43, SD = 1.16; 2 = "moderately intense", 3 = "considerably intense"). The magnitude of the effect size was also large (R = -.53), indicating that the intensity of cravings in the past 24 hours strongly decreased from pre-test to post-test. Figure 2 shows the average pre and post-test responses to the BSCS question pertaining to the intensity of cravings in the past 24 hours.

To test whether cravings in the past 24 hours were less frequent after completing the 8-week program, the Sign Test was conducted on the frequency of cravings question from the BSCS to compare participant responses at pre-test and post-test. The results demonstrate that cravings were significantly less frequent at post-test compared to pre-test (11 scores dropped, 1 increased, and 2 had no change), p=.005. The mean score dropped from 1.86, SD = 0.66 at the pre-test, to = 0.79, SD = 0.89 at the post-test at post-test. The null hypothesis of the sign test, that the median of differences between drug craving frequency at pre-test and post-test was equal to zero, was rejected (p = .006).

Figure 3 shows the average pre and post-test responses to the BSCS question pertaining to the frequency of cravings in the past 24 hours. Figure 3 shows the average pre and post-test responses to the BSCS question pertaining to the frequency of cravings in the past 24 hours. To test whether the length of time spent craving in the past 24 hours was smaller after completing the program, a Wilcoxon signed-rank test was conducted on the pre-test and post-test responses to the BSCS question pertaining to the length of cravings in the past 24 hours. Indeed, participants spent less time craving in the past 24 hours at post-test (M = 0.57, SD = 0.65; 0 = "none at all", 1 = "very short amount of time") compared to at pre-test (M = 1.86, SD = 0.66; 1 = "very short amount of time", 2 = "short amount of time"), Z = -2.99, p = .003. The magnitude of the effect size was large (R = -.57), indicating that the length of cravings in the past 24 hours strongly decreased from pre-test to post-test. Figure 4 shows the average pre and post-test responses to the BSCS question pertaining to the length of cravings in the past 24 hours.

To test whether cravings in the past 24 hours were less frequent after completing the 8-week program, the Sign Test was conducted on pre-test and post-test responses to the BSCS question pertaining to the number of cravings in the past 24 hours. The results demonstrate that cravings were significantly less frequent at post-test compared to pre-test (11 scores dropped, 1 increased, and 2 had no change), p=.001. The mean score dropped from 5.29, SD = 4.25 at the pre-test, to = 0.86, SD = 1.88 at the post-test. Figure 5 shows the average number of cravings in the past 24 hours pre and post-tests.

To test whether the 8-week program generally reduces symptoms associated with cravings (i.e. intensity, frequency, and length of cravings), a Wilcoxon signed-rank test was conducted on pre-test and post-test composite scores (the sum of the three BSCS

questions). Participants exhibited higher overall cravings at pre-test (M = 6.14, SD = 2.28) compared to at post-test (M = 2.00, SD = 2.25), Z = -3.08, $p < .002$. The magnitude of the effect was large (R = -.58), indicating that the overall level of cravings in the past 24 hours strongly decreased from pre-test to post-test. Additionally, a sign-test was conducted on the total number of cravings after 24 hours comparing pre-test and post-test because the distribution of the difference scores was not symmetrical. The median of differences between the number of cravings at pre-test and post-test was different from zero, $p < .001$, meaning that the number of cravings after 24 hours did differ from pre-test to post-test. Figure 6 shows the average pre and post-test responses to the composite scores on items 1-3 of the BSCS. Finally, Table 2 shows the Means (Standard Deviations) and significance levels of BSCS items at pre-test and post-test.

Summary of Findings

Participants' responses to BSCS questions regarding different components of cravings in the past 24 hours (intensity, frequency, and length of cravings), as well as overall craving ratings and actual number of cravings reported, were compared before and after completing an 8-week mindfulness program. Significantly lower ratings of intensity, frequency, and length of cravings were reported at the post-test measurement compared to the pre-test measurement (see Table 2). Additionally, there were fewer actual cravings reported, and lower overall cravings (i.e. composite score) reported at the post-test compared to the pre-test. This would suggest that the program treatment was successful in reducing symptoms of cravings. However, these results must be interpreted cautiously, as there may be at least two potentially confounding variables. The first potential confound is that the participants are part of a residential program who are getting treatment for their SUD. Therefore, any reduction in symptoms may be a result

of other treatment and/or a combination of treatments, including the eight -week mindfulness-based relapse prevention program. The second potentially confounding variable is related to the first. Participants in the present study are already in a residential program for treatment of their SUD and agreed to participate in the mindfulness program. Therefore, there may be significant differences in the motivation and/or personality traits of participants who volunteered to participate in the MBRP treatment. It may be the case that participants in the present study were more motivated and likely to experience a reduction in symptoms regardless of their participation in the present study.

Discussion

As with other reported results (Bowen et al., 2009; Witkiewitz & Bowen, 2010) the data analysis in this study support that participation in MBRP was associated with significant reductions in cravings following the 8-week program. The hypothesis that subjects in the MBRP program would have a reduction in drug cravings was confirmed at the level of $p \leq .002$ for composite cravings and $p < .0001$ for the total number of cravings. Results showed that MBRP is an effective treatment modality in this residential treatment program within this 18-24, year group. Although the sample size was small, these findings validate the effectiveness of the MBRP within this and the body of research that supports MBRP as a beneficial treatment modality.

Research has repeatedly shown that cravings are marked by extreme urges to use substances and are strong predictors of relapse (Witkiewitz, Bowen, Douglas & Hsu, 2013; Hartz, Frederick-Osborne & Galloway, 2001). Although relapse rates were not examined following this MBRP program, findings in larger more robust studies did correlate decreases in cravings with decreases in relapse rates at 12-month follow ups

(Bowen, et al., 2014; Witkiewitz & Bowen, 2010). Therefore, it cannot be ignored that given the same intervention and similar population that subjects in this study will have a similar reduction in relapse rates as a result of this program.

This study was not powered to examine the effect of the aforementioned confounders, nor was it powered to examine differences in outcomes between minorities and non-Hispanic whites. However, MBRP is designed to engender an accepting, non-judgmental stance and self-compassionate approach, which may be useful for racial and ethnic minorities who have been discriminated against (Jones, 2000).

Threats to Validity

Threats to internal validity include the constraints of a single-site, single-cohort, small sample without randomization or control groups. There was no control over history or selection bias. This was a residential treatment setting where participants have made individual commitments to live and engage in treatment. The identical questionnaire was used for the pre-test and post-test, measuring identical data, thereby reducing threats from instrumentation changes.

External validity is strengthened through the choice of the study instrument in that participants were not cued to the anticipated effects of the independent variable (MBRP), which would likely change their responses on the post-test or the independent variable.

Strengths and Weaknesses of the Design

Weaknesses of this study pertain to its overall lack of external validity due to convenience sampling. This sample was not a true representation of all individuals with SUD. This type of design does not account for pre-existing factors or confounding variables that would influence their investment in treatment, nor does it recognize that

influences outside the experiment may affect the results. Furthermore, the sample size was small, beginning with 17 subjects and became smaller after 3 subjects left the program due to unforeseen clinical transgressions. However, the inherent weaknesses in the methodology do not undermine the validity of the data in this quasi-experimental design. The findings of this study may thus be integrated with the growing body of evidence on this related topic.

Nursing Practice Implications

As evidenced throughout this report, SUD is a problem claiming tens of thousands of lives and millions of dollars that is only becoming more out of control. Programs to aid persons with SUD do not address the problem in a satisfactory manner. Studies on SUD treatment highlight the need for a more aggressive approach to interrupting relapse patterns. Through the course of this project, MBRP has been described and shown to have an impact on helping maintain abstinence. Although other modes of treatment are beneficial, the implications of this study are to provide support for the practice of MBRP intervention in residential treatment and stimulate the continued research on this mode of treatment as a beneficial approach to interrupting destructive relapse patterns. Furthermore, the findings of this study may be used to compare MBRP effectiveness within other treatment facilities of similar residential design within the same or other organizations. It is imperative that research on SUD, relapse prevention and other modalities of treatment continue to be researched and reported upon.

Products of the Scholarly Project

A scholarly project report was presented to the University of Virginia School of Nursing and to the residential treatment center providing a summary of the findings. The researcher consulted with the residential treatment center on adding this modality to the current treatment agenda at this as well as other programs under the company's umbrella. An intervention manual along with the protocol for implementing MBRP was a part of this consultation along with an agenda for the clinical staff follow and to implement. Submission of the finished manuscript or adaptation of the finished manuscript will be submitted to the DNA Reporter / Delaware Nurses Association to inform nursing. A final manuscript will also be submitted to the Journal of the American Psychiatric Nurses Association. Author guidelines are detailed in Appendix D and E respectively.

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Appendix A

Table 1.

Demographic Characteristics

Variable	Participants N=14	
	Frequency (n)	**Percent (%)**
Age at study entry (years)		
20	3	21.4
22	1	7.1
23	1	7.1
24	9	64.3
Gender		
Female	4	28.6
Male	10	71.4
Race /Ethnicity		
White, non-Hispanic	10	71.4
African American/Black	2	14.3
Hispanic/Latino	2	14.3

Table 2.

Means (Standard Deviations) and significance levels of BSCS items at pre-test and post-test.

BSCS Item	Pre-test	Post-Test	*p*
Intensity of Cravings[1]	2.43 (1.16)	0.64 (0.93)	.005[3]
Frequency of Cravings[1]	1.86 (0.66)	0.79 (0.89)	.006[4]
Length of time spent craving[1]	1.86 (0.66)	0.57 (0.65)	.003[3]
Total number of cravings	5.29 (4.25)	0.86 (1.88)	<.0001[4]
Composite cravings[2]	6.14 (2.28)	2.00 (2.25)	.002[3]

[1] Possible range: 0-4. [2] Sum of the first three BSCS items; possible range: 0-12.
[3] Wilcoxon Signed-Rank Test [4] Sign Test

Table 3.

Review of Literature

Study	Purpose	Sample/Design	Measures	Results
Ardame, Bassaknejad, Zargard, Rokni, Sayyah, 2014	To examine the relationship between MBRP and craving in drug addicts in a methadone treatment program.	N=80 Single cohort study. Convenience sample. Pre-Post design	Subjects in methadone treatment given two questionnaires to exame the variables. Five facets mindfulness questinnaire and heroin craving questionnaire.	Significant inverse relation between mindfulness factors and craving sub scales. Report that the four factors of mindfulness such as observation, describing, acting with awareness and non-reactivity to inner experience can totally predict 48 percent of craving variance.
Bowen, et al., 2017	To inform protocol adaptation for methadone maintenance program and to evaluate the feasibility and efficacy of MBRP for this population	N=15 methadone patients. Mixed methods study	Self-report measures on craving, depression, anxiety, symptomatic stress, experiential avoidance. Reports at baseline and post 6 week MBRP course.	Results from this initial pilot trial support feasibility and acceptability, efficacy and provide preliminary data on outcomes for future trials of mindfulness-based approaches within the MMT community.
Bowen, et al., 2009	Evaluated the feasibility and initial efficacy of MBRP in comparison to treatment as usual	N=168 from non profit agency providing continuum of care for alcohol and drug use disorders.	TAU versus MBRP intervention. Measured on Substance use throughout, Alcohol and drug craving,	Results of the current study provide evidence for the feasibility and initial efficacy of MBRP, offering empirical support

Study	Purpose	Sample/Design	Measures	Results
	(TAU) among individuals with substance use disorders. The study assessed treatment effects on substance use outcomes as well as key secondary processes including craving, mindfulness, and acceptance. It was hypothesized that participation in MBRP would be associated with greater reductions in substance use, and greater increases in mindfulness and acceptance in MBRP versus TAU participants.	Pilot randomized controlled trial.	Alcohol and drug consequences, Mindfulness, Acceptance Feedback The treatment was delivered in 8 weekly, 2-hour group sessions, following the protocol outlined in the MBRP treatment manual	for MBRP as an alternative to standard-of-care 12-step- based or related aftercare programs. Outcomes suggest significant improvement in MBRP versus TAU participants in days of substance use, craving, awareness, and acceptance. Differences were not evident on other aspects of mindfulness (observing, describing, nonjudgment of inner experience, and nonreactivity to inner experience). Additionally, although participants in both groups reported a decrease in substance-related problems, decreases were not significantly different between groups. Finally, analyses of sociodemographic variables (gender, ethnicity, and severity of initial substance use) did

Study	Purpose	Sample/Design	Measures	Results
				not show evidence of their moderating effects on treatment outcomes. MBRP extends the populations for which mindfulness meditation therapies can be used to alleviate distress and foster fundamental change in maladaptive patterns of behavior.
Bowen, et al., 2014	Evaluation of the long-term efficacy of MBRP in reducing relapse compared with just relapse prevention and TAU during a 12 month follow up period.	N=286 aged 18-70 Between 2009 and 2012, subjects completing treatment for SUD were randomized into one of 3 groups. They were assigned to 8 weekly group sessions of MBRP, Relapse prevention or TAU.	Evaluated the frequency of substance use in the past 90 days. Variables were assessed at baseline and at 3-, 6-, and 12-month follow-up points. Measures used included self-report of relapse and urinalysis drug and alcohol screenings.	Compared with TAU, subjects assigned to MBRP and RP reported lower risk of relapse to substance use and heavy drinking and among those who used substances, significantly fewer days of substance use and drinking at the 6 month follow up. Relapse prevention group showed and advantage over MBPRM in time to first drug use.

Study	Purpose	Sample/Design	Measures	Results
				However, MBRP subjects reported significantly fewer days of substance use and significantly decreased heavy drinking compared to relapse prevention and TAU
Carpentier, Romo, Bouthillon-Heitzmann and Limosin, 2015.	Protocol to evaluate the mindfulness technique on alcohol consumption, impulsiveness, automatic thoughts, anxiety and abilities to cope.	N=26 Non-controlled research. An intervention MBRP was proposed to 26 patients who were assigned to three groups. They were questioned about their alcohol consumption and assessed by a protocol of seven evaluations before and after the group MBRP	MBRP was proposed to 26 patients who were assigned to three groups. They were questioned about their alcohol consumption and assessed by a protocol of seven evaluations before and after the group MBRP Five Facets Mindfulness (FFMQ) Impulsive Behavior Scale (UPPS) Acceptance and Action Questionnaire (AAQ II) State Trait Anxiety Inventory (STAI-A, STAI-B)	The results show maintained abstinence and a moderation leading to abstinence for the still consuming patients. Evaluations, obtained several significant results after the therapy, despite the small cohort: patients accepted their thoughts and feelings better (FFMQ-judgment); the tendency to give in to the impulses decreased (urgency-UPPS), and their tolerance to anxiety increased (STAI-YA-YB). This study appears to confirm that the MBRP program allows an

Study	Purpose	Sample/Design	Measures	Results
			Questionnaire of the automatic thoughts (QPA) The Drug-Taking Confidence Questionnaire (DTCQ-8).	improvement of self-efficiency.
Chawla, et al., 2010	The aim of the current study was to develop a reliable and valid quantitative measure of therapist adherence and competence in delivering MBRP.	Audio recordings from 44 randomly selected group-treatment sessions (50%) were rated by independent raters for therapist adherence and competence in the RCT. Study describes the development of the MBRP-AC, assess its' interrater reliability and validity. And its use to assess therapist adherence and competence in the context of an MBRP RCT.	The MBRP-AC was developed in the context of a randomized controlled trial (RCT) of MBRP efficacy and consists of two sections: Adherence (adherence to individual components of MBRP and discussion of key concepts), and Competence (ratings of therapist style/approach and performance). Audio recordings from 44 randomly selected group-treatment sessions (50%) were rated by independent raters for therapist adherence and competence in the RCT.	Findings evinced high inter-rater reliability for all treatment adherence and competence ratings, and adequate internal consistency Components of the Competence section were positively related to measures of therapeutic alliance, and overall ratings on the Adherence section were positively related to measures of change in mindfulness over the course of the treatment.

Study	Purpose	Sample/Design	Measures	Results
Chiesa and Serretti, 2013	Review of current evidence on therapeutic efficacy of mindful based interventions on SUD.	24 studies were included. Current evidence suggests that mindful based interventions can reduce the consumption of several substances including alcohol, cocaine, amphetamines, marijuana, cigarettes, and opiates to a significantly greater extent than waitlist controls, non-specific educational support groups, and some specific control groups.	The search included articles written in English published up to December 2011. Quality of included trials was assessed. In total, 24 studies were included, three of which were based on secondary analyses of previously investigated samples	Evidence suggests that mindfulness based interventions are associated with a reduction in craving as well as increased mindfulness. The limited generalizability of the reviewed findings is noted due to several factors included the lack of consistent replicated finding, small sample size, lack of methodological details. More rigorous and larger randomized controlled studies are warranted.
Garland, Gaylord, Boettiger and Howard, 2010	Evaluate the effectiveness of the more Mindfulness training on the disrupting the risk chain of stress related alcohol relapse.	N=53 adult males (white and African American). Randomized alcohol dependent adults from a therapeutic community to a mindfulness group OR to a support group. Self report measures, psychophysiologic al cue reactivity.	The ten-session, manualized M.O.R.E. intervention was adapted as a treatment for alcohol dependence from Mindfulness-Based Cognitive Therapy, an empirically-supported, mindfulness intervention designed to prevent	Mindfulness training significantly reduced stress and thought suppression, increased physiological recovery from alcohol cues, and modulated alcohol attentional bias. Hence, mindfulness training appears to target key

Study	Purpose	Sample/Design	Measures	Results
			depression relapse. M.O.R.E. involves mindful breathing and walking meditations, as well as experiential exercises relating general mindfulness principles to addiction-specific issues such as relapse triggers, craving, thought suppression, stress, and unconscious substance use behaviors.	mechanisms implicated in alcohol dependence, and therefore may hold promise as an alternative treatment for stress-precipitated relapse among vulnerable members of society
Grow, Collins, Harrop and Marlatt, 2015	Aim to examine the association between home practice and key treatment outcomes. Study fills a research gap of home practice that is a key component of MBRP.	N=168 adults in community-based setting. Randomization was based on the type of substance abused (i.e. alcohol, cocaine, opiates, etc.). Study builds on MBRP research by examining time spent in home practice of mindfulness.	Measurements of cravings and of actual alcohol and other drug use. Used the Timeline Follow-back tool to assess daily use of alcohol and drugs. Used the Penn Alcohol Craving Scale (PACS) which was adapted to include both alcohol and drug craving. The PACS is a 5-item, self-report measure assessing frequency,	AOD frequency significantly decreased over the course of the study. Home practice was inversely correlated with AOD use. Thus, averaged over the study, each additional hour of home practice was associated with 53% lower AOD use rates Craving significantly decreased over the course of the study

Study	Purpose	Sample/Design	Measures	Results
			intensity, and duration of craving, and overall rating of craving for the previous week. It has shown excellent internal consistency and predictive validity for alcohol relapse. Its internal consistency in the current sample was .87. The total PACS score was used as an outcome variable in this study.	after controlling for the time effects, home practice was inversely correlated with craving.
Hartz, Frederick-Osborne & Galloway, , 2001	To investigate the role of craving methampheta mine use as a direct correlate to use of substances later that week.	N=31 men and women Prospective 12 week trial	Prospective, repeated-measures, within-subject analysis, craving intensity significantly predicted methamphetamin e use in the week immediately following each craving report.	Craving remained a highly significant predictor in multivariate models controlling for pharmacological intervention, and for methamphetamin e use during the prior week. Craving scores that preceded use were 2.7 times higher than scores that preceded abstinence. Risk of subsequent use was 2.5 times greater for scores in the upper half of the scale

Study	Purpose	Sample/Design	Measures	Results
				relative to scores in the lower half.
Imani, et al., 2015	Investigate feasibility and effectiveness of adding mindfulness-based group therapy to opioid pharmacotherapies as compared to opioid pharmacotherapies alone.	N=30 Randomized clinical trial (RCT) that explores the effectiveness of mindfulness-based relapse prevention group therapy among opioid dependent clients in Iran. Clients receiving treatment as usual were randomly assigned to intervention and control groups.	Intervention was a combination of 8-session mindful- ness-based group therapy developed by Bowen et al. and the usual treatment provided to opioid dependents in INCAS clinic. The study was designed in a manner to be comparable to other studies of mindfulness-based group therapy for addiction treatment. Scales: Participation, Drug Screening, Addiction Severity Index, Alcohol and drug cravings.	The primary outcomes were treatment retention and percentage of weekly morphine, methamphetamine, and benzodiazepine negative tests. This was a weak article without clear measures on outcome.
Larimer, Palmer and Marlatt, 1999	N/A	Relapse prevention: An overview of Marlatts Cognitive Behavioral Model	The topic of relapse is explored as well as cognitive constructs, antecedent processes leading to relapse and the cycle of SUD	N/A

Study	Purpose	Sample/Design	Measures	Results
Li, et al., 2017	Mindfulness treatment for SUD Review of Literature/Meta-AnalysisA total of 42 studies examined effects of different types of mindfulness treatment for substance misuse problems and were included in this systematic review:	N=459 cross section of men, women, teens and adults. 8 studies using quasi-experimental designs, and 34 studies using randomized controlled trial (RCT) designs. Exclusive studies focused on women; men; teens and several in criminal justice system.	Evaluate different types of mindfulness treatment, including mindfulness training adapted from Mindfulness-Based Stress Reduction (MBSR) for smoking cessation. Mindfulness-Based Relapse Prevention (MBRP) Mindfulness-Oriented Recovery Enhancement (M.O.R.E.) Vipassana Meditation (VM) Mindfulness meditation training as an adjunct to goal management training, combined motivational interviewing and mindfulness meditation for marijuana misuse. Mindfulness-based therapeutic	Overall, the methodological quality of the studies was high as exemplified by the majority (81.0%) employing randomized controlled trial designs. Meta-analytic results revealed significant small-to-large effects of mindfulness treatments in reducing the frequency and severity of substance misuse, intensity of craving for psychoactive substances, and severity of stress. Mindfulness treatments were also effective in increasing rates of post-treatment abstinence from cigarette smoking compared to alternative treatments. Mindfulness treatment for substance misuse is a promising intervention for substance misuse, although more research is needed

Study	Purpose	Sample/Design	Measures	Results
			community treatment.	examining the mechanisms by which mindfulness interventions exert their effects and the effectiveness of mindfulness treatments in diverse treatment settings.
Witkiewitz, Bowen, Douglas and Hsu, 2013	Evaluate MBRP effectiveness on reducing craving as a predictor for substance use and MBRP effectiveness at increasing participants "Acting with awareness."	N=168 from private non profit agency. Participants were randomly assigned (using a computerized random number generator) to either 8-weeks of MBRP or continuation of their existing treatment (treatment as usual, TAU). Participants randomized to MBRP agreed to discontinue TAU for the 8- weeks of the course, and to resume TAU following completion of MBRP. Report on: Craving, defined as the subjective experience of an urge or desire to	MBRP participants were scheduled to complete a web-based follow-up assessment on craving immediately following the 8-week course, and 2-months and 4-months following the intervention.	Measures on Alcohol and drug craving as well as "Acting with awareness" were significantly better in MBRP group.

Study	Purpose	Sample/Design	Measures	Results
		use substances, has been identified in clinical, laboratory, and preclinical studies as a significant predictor of substance use, substance use disorder, and relapse following treatment for a substance use disorder. Secondary analyses of data from a randomized controlled trial that examined MBRP as an aftercare treatment for substance use disorders. Craving as a predictor for substance use.		
Witkiewitz, Greenfield and Bowen, 2013	Evaluate MBRP vs. RP in terms of reducing cravings and actual relapse.	N=70 racial and ethnic minorities. RCT with 15-week follow up of women in control group versus treatment group in a residential placement. The study was a secondary analysis of a randomized clinical trial of two evidence-based treatments,	The MBRP intervention was based on the MBRP manual (Bowen et al., 2010) and was adapted to a rolling group format. Primary objectives of MBRP were to help clients identify reactions to common	At 15-week follow- up, regression analyses found that racial and ethnic minority women in MBRP, compared to non-Hispanic and racial and ethnic minority women in RP, reported significantly fewer drug use days (d = .31) and lower addiction

Study	Purpose	Sample/Design	Measures	Results
		mindfulness-based relapse prevention (MBRP) and relapse prevention (RP), as part of a residential addiction treatment program for women referred by the criminal justice system	triggers, recognize and cope skillfully with craving through acceptance, awareness, and non-judgment of experience, integrate mindfulness practices into daily life and high-risk situations, and identify the role of thoughts in the relapse process. Importantly, MBRP emphasized the clients' individual experiences in building coping skills.	severity (d = .65), based on the Addiction Severity Index. Although the small sample size is a limitation, the results suggest that MBRP may be more efficacious than traditional treatments for racial and ethnic minority women.
Witkiewitz, Lustyk and Bown, 2013	Authors discuss: areas of the brain have been associated with craving, negative affect, and relapse and also been shown to be affected by mindfulness training.	Drawing from the neuro-imaging literature, they review several plausible mechanisms by which MBRP might be changing neural responses to the experiences of craving and negative affect, which subsequently may reduce risk for relapse. They hypothesize that MBRP may affect numerous brain	Efficacy trial found that those randomized to MBRP, as compared to those in a control group, demonstrated significantly lower rates of substance use and greater decreases in craving following treatment. Furthermore, individuals in MBRP did not report increased	Craving, the subjective experience of an urge or desire to use substances has been shown to strongly predict relapse for all major drugs of abuse. Craving is a complex construct, and operational and conceptual definitions vary widely, yet clinicians,

Study	Purpose	Sample/Design	Measures	Results
		systems and may reverse, repair, or compensate for the neuroadaptive changes associated with addiction and addictive behavior relapse.	craving or substance use in response to negative affect.	researchers, and clients agree that the subjective experience of craving is an essential facet of substance use disorders. Mindfulness-Based Relapse Prevention (MBRP; Bowen, Chawla, & Marlatt, 2010; Witkiewitz, Marlatt, & Walker, 2005), was designed to target experiences of craving and negative affect and their role in the relapse process.
Witkiewitz, Marlatt and Walker, 2005	Review of cognitive behavioral model, Relapse prevention model, behavioral mechanisms of change, cognitive mechanisms of change.	New approach of MBRP first theorized with preliminary findings.	Delve into discussion about the efficacy of meditation, mindfulness meditation. Review of the successes of all treatments unblended.	Introduction of MBRP as a new approach. History, implications and efficacy are highlighted.
Vallejo and	Aim was to adapt Mindfulness-	N=262	Participant ratings on various dimensions of our	All but two items showed statistically

Study	Purpose	Sample/Design	Measures	Results
Amaro, 2009	Based Stress Reduction to relapse prevention and incorporating the new MBRP treatment as an approach.	Marginalized, poor African-American women and Latina women with histories of trauma. Pre-Post design, single cohort study.	mindfulness-based relapse program for women in addictions recovery were obtained from 161 women who completed the program. Participant ratings on 13 items were compared between those of the first year of implementation (prior to the adaptation to a relapse prevention approach) and those in the fourth year of implementation (after the adaptation to relapse prevention approach).	significant improvements from 2003, the first year of implementation, to 2006, the next to last year of implementation for which data were collected. Overall, the results indicate high rates of satisfaction and acceptability, especially with the adapted model. The most fundamental change was the reshaping and reorientation of MBSR into a mindfulness-based relapse prevention program whose central focus is the role of stress in relapse. Particular effort was made to apply mindfulness-based skills to assist in relapse prevention and early recovery. The goals of the adapted program.

Study	Purpose	Sample/Design	Measures	Results
Zgierska, et al., 2008	Feasibility of implementing MBRP to at home course and evaluation of its effectiveness.	N=19 adults Pilot study 16-week prospective case series was designed to gather preliminary data about the efficacy of meditation for relapse prevention and to evaluate study methods feasibility.	Graduates of an intensive outpatient program were enrolled. Fifteen subjects completed the 8-week meditation course supplemented by at-home meditation and "standard of care" therapy. Outcome measures included surveys and 2 stress-responsive biomarkers. Measures were: Relapse triggers Depression Anxiety Stress and Craving	Subjects were abstinent for 30 days at enrollment. Completers (N=15) attended 82% of meditation course sessions and meditated an average of 4.6 days per week and were abstinent on 94% of study days with 47% reporting complete abstinence. Negative markers decreased and positive markers increased.

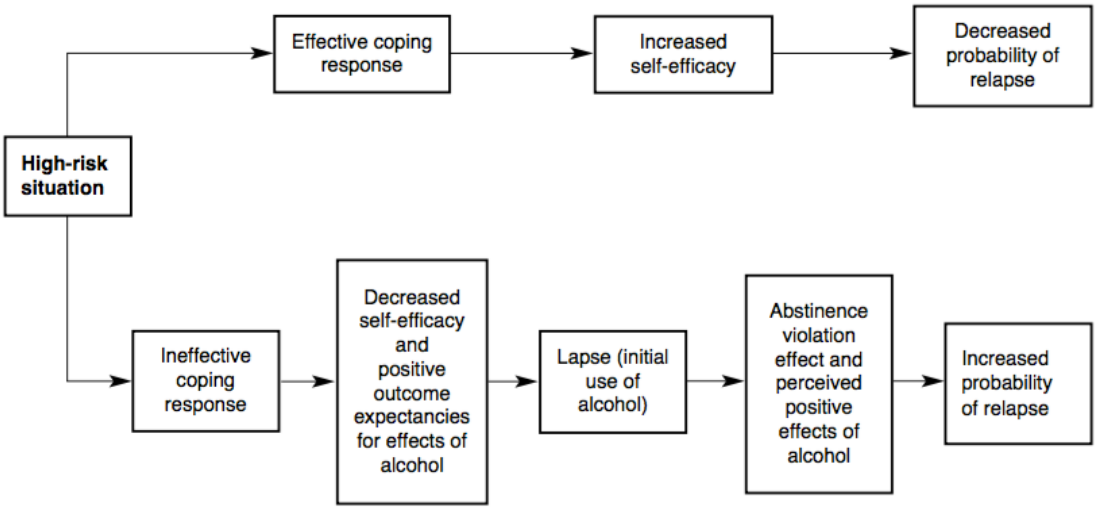

Figure 1. Conceptual Model for Cognitive Behavioral Model for Relapse Reprinted from "Relapse Prevention: An Overview of Marlatt's Cognitive-Behavioral Model," by Larimer, M., Palmer, R., & Marlatt, G. A. (1999). Alcohol Research and Health. Volume, 23, Issue, 2, p. 152.

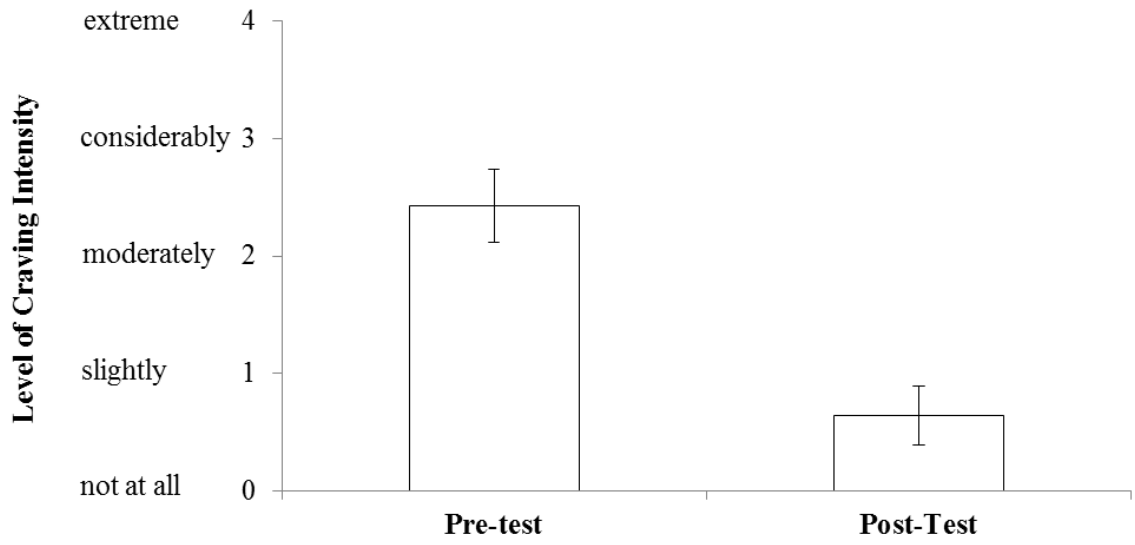

Figure 2. Average Pre- and Post-test responses to the BSCS question pertaining to the level of intensity of cravings in the past 24 hours.

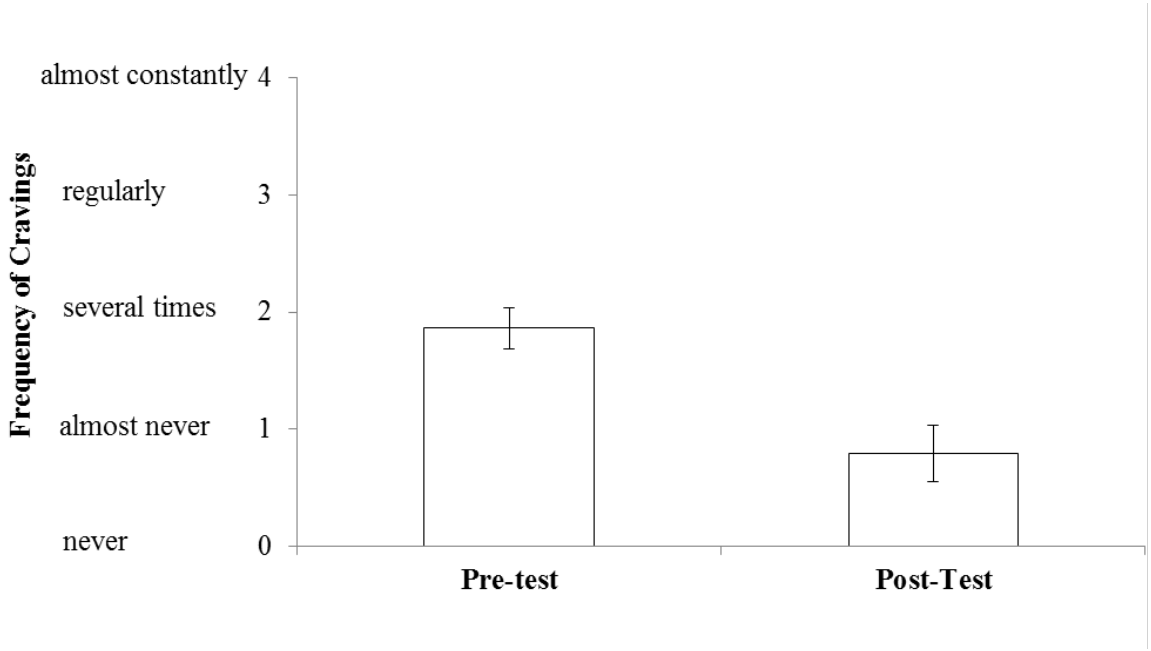

Figure3. Average Pre- and Post-test responses to the BSCS question pertaining to the frequency of cravings in the past 24 hours.

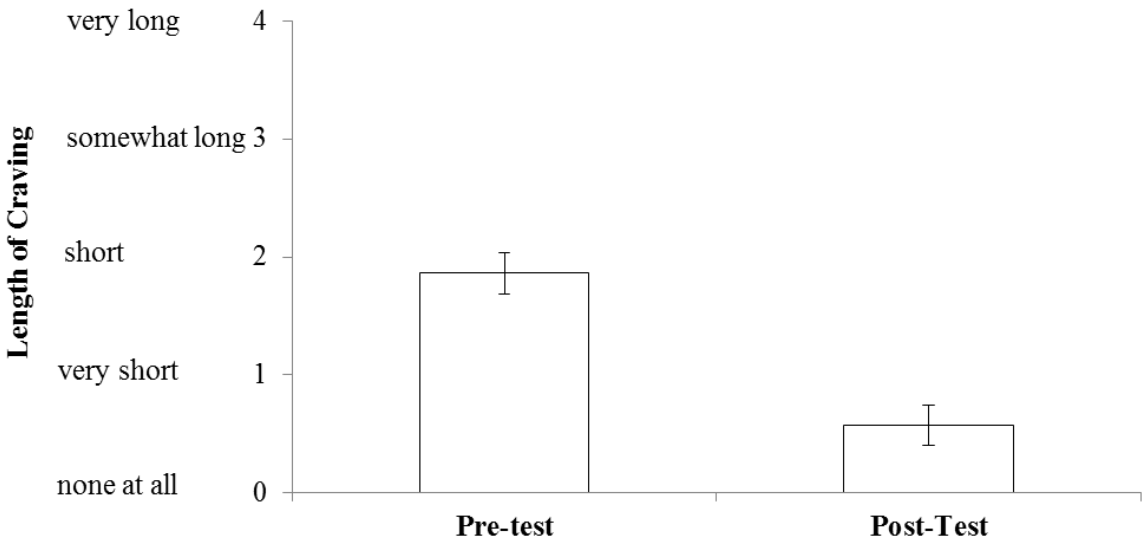

Figure 4. Average Pre- and Post-test responses to the BSCS question pertaining to the length of cravings in the past 24 hours.

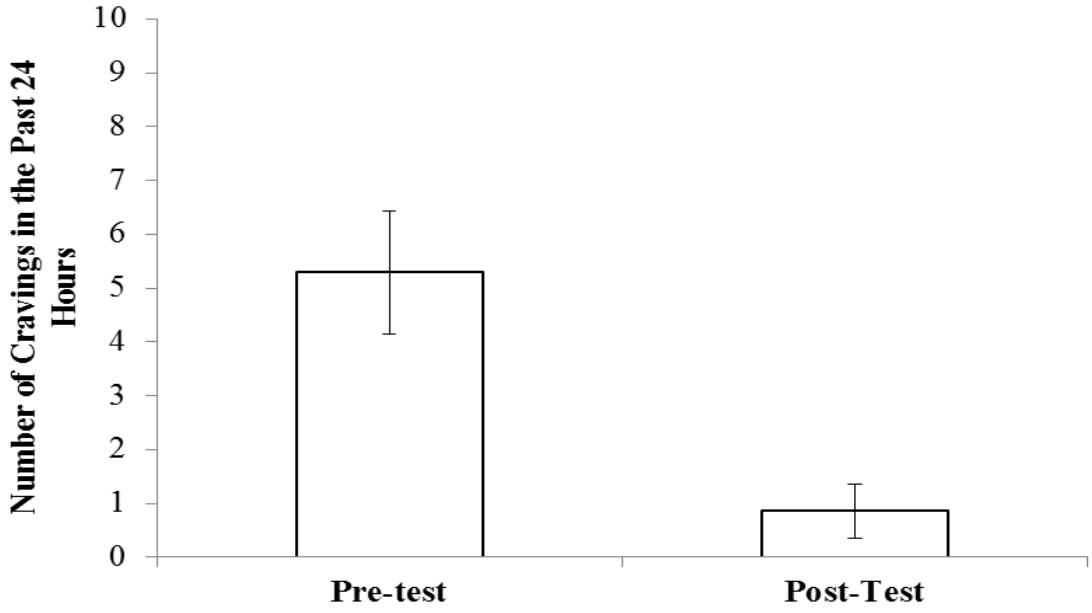

Figure 5. Average number of cravings in the past 24 hours at Pre- and Post-tests.

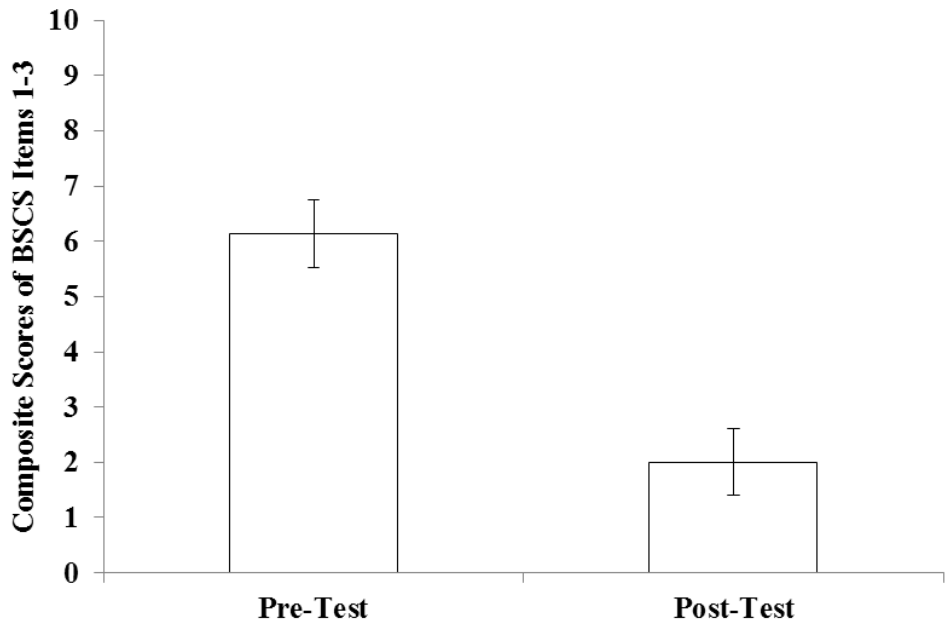

Figure 6. Composite Scores of BSCS items 1-3 at pre-test and post-test

Appendix B

Brief Substance Rating Scale

Brief Substance Craving Scale

Agency Name: _____ **Site Name:** _____

ID #: _____ **Date:** __ __ / __ __ / __ __ __ __

STAFF USE ONLY

A. Identify the primary substance dependence for which the participant is being treated at this clinic.

Downers or Sedatives (Barbiturates, etc.) ❑1
Benzos (Valium, Xanax, etc.) ❑2
Hallucinogens (including ecstasy) ❑3
Alcohol ❑4
Heroin or other Opiates (Morphine, etc.) ❑5
Marijuana ❑6
Stimulants (cocaine, amphetamine) ❑7
Other (specify): _____ ❑8

Please answer the following questions with regard to your craving for the primary drug.

1. The INTENSITY of my craving, that is, how much I desired this drug in the past 24 hours was:

None at all ❑0
Slight ❑1
Moderate ❑2
Considerable ❑3
Extreme ❑4

2. The FREQUENCY of my craving, that is, how often I desired this drug in the past 24 hours was:

Never ❑0
Almost never ❑1
Several times ❑2
Regularly ❑3
Almost constantly ❑4

3. The LENGTH of time I spent in craving this drug during the past 24 hours was:

None at all ❑0
Very short ❑1
Short ❑2
Somewhat long ❑3
Very long ❑4

4. Write in the NUMBER of times you think you had craving for this drug during the past 24 hours. __ __

Appendix C

Informed Consent

Consent of an Adult to Be in a Research Study

In this form "you" means a person 18 years of age or older who is being asked to volunteer to participate in this study.

*Participant's Name*_____

Principal Investigator:	*Edie Barbero, PhD* *P.O. Box 800826* *UVA School of Nursing* *Charlottesville, VA 22903* *434-960-7475* *ed5z@virginia.edu*

What is the purpose of this form?

This form will provide you with information about this research study. You do not have to be in the study if you do not want to. You should have all your questions answered before you agree to be in this study.

Please read this form carefully. If you want to be in the study, you will need to sign this form. You will be given a signed copy of this form.

Who is funding this study?

There is no funding for this study.

Why is this research being done?

Substance Use Disorder is a plaguing problem throughout the world. The programs used to help people recover are not as helpful as they could be and relapse is a common problem that occurs in two-thirds of people trying to recover. The reason we are doing this research is to find out if Mindfulness-Based Relapse Prevention is better at reducing cravings for drug use over the current treatment you are getting.

This research will involve the practice of meditation, learned through a class called Mindfulness-Based Relapse Prevention. The class will meet one time per week for 8 weeks. Each weekly session will be conducted for 2 hours, with a break in the middle.

You are being asked to be in this study, because of you are being treated at this facility with a goal of recovery. We hope to learn more about whether this mindfulness program will help to lessen the chances of relapse.

Up to 16 people will be in this study at Fresh Start.

What will happen if you are in the study?

If you agree to be in this study, you will sign this consent form before any study procedures take place. Then, the following will occur:

- We will ask you to fill out a short questionnaire which asks about your craving of several different substances. The questionnaire will take about five minutes.
- You will attend 8 – 2 hour sessions in this residential setting.
- In the first session a description of what Mindfulness-Based Relapse Prevention is will be explained and the first of 8 meditative practices will be implemented. You will be asked to sit in a comfortable position and receive educational instruction as well as engage in meditation. You will be asked to engage in mediation outside of this group on your own prior to the next session.
- At the following 7 sessions, you will engage in other directed meditation that will guide you through an awareness, mindfulness, of the experience of cravings.
- The mindfulness/meditation sessions will not take the place of your treatment, but will be in addition to your planned care.
- At the end of the 8 week course, we will ask you to repeat the questionnaire you took before the first session. Then, your participation in the study will be complete.

During this study, you will be asked to fill out a questionnaire. This questionnaire asks about:

- Your age
- Your gender
- Your race
- Cravings for substances

WHAT ARE YOUR AND YOUR PARENT/LEGAL GUARDIAN'S RESPONSIBILITIES IN THE STUDY?

You have certain responsibilities to help ensure your safety.

These responsibilities are listed below:

- You must attend each study visit.
- You must be completely truthful about your health history.
- Follow all instructions given.

- You should tell the study staff about any changes in your health or the way you feel.
- Answer all of the study-related questions completely.

How long will this study take?

Your participation in this study will require 8 visits over 8 weeks. Each visit will last about 2 hours.

If you want to know about the results before the study is done:

The final results of the research will not be known until all the information from everyone is combined and reviewed. At that time you can ask for more information about the study results.

What are the risks of being in this study?

There is only a very small risk that someone could see your private information. Your name will not be written on the questionnaires.

Risks from Completing Questionnaires

- Some of the questions asked may make you emotionally upset or stressed out now or at a later time. If this occurs, you may contact the researcher or clinical staff. If you do not wish to answer a question, you may skip it and to the next question

Other unexpected risks:

You may have side effects that we do not expect or know to watch for now. Call the study leader if you have any symptoms or problems.

Could you be helped by being in this study?

You may or may not benefit from being in this study. Possible benefits include: a decrease in uncomfortable cravings and a decreased risk for relapse. In addition, information researchers get from this study may help others in the future.

What are your other choices if you do not join this study?

You do not have to be in this study to be treated for your illness or condition. You will get the usual treatment even if you choose not to be in this study. The usual treatment would include:

- Individual therapy
- Group therapy
- Educational groups
- 12-step meetings

If you are an employee of UVa your job will not be affected if you decide not to participate in this study.

If you are a student at UVa, your grades will not be affected if you decide not to participate in this study.

Will you be paid for being in this study?

You will not get any money for being in this study.

Will being in this study cost you any money?

All of the procedures (mindfulness classes and questionnaires) in this study will be provided at no cost to you or your health insurance. You will continue to be responsible for the cost of your care in the Fresh Start program.

What if you are hurt in this study?

If you are hurt as a result of being in this study, there are no plans to pay you for medical expenses, lost wages, disability, or discomfort. The charges for any medical treatment you receive will be billed to your insurance. You will be responsible for any amount your insurance does not cover. You do not give up any legal rights, such as seeking compensation for injury, by signing this form.

What happens if you leave the study early?

You can change your mind about being in the study any time. You can agree to be in the study now and change your mind later. If you decide to stop, please tell us right away. You do not have to be in this study to get services you can normally get at the University of Virginia or Gaudenzia.

Even if you do not change your mind, the study leader can take you out of the study.

How will your personal information be shared?

The UVa researchers are asking for your permission to gather, use and share information about you for this study. If you decide not to give your permission, you cannot be in this study, but you can continue to receive regular medical care at UVA/Gaudenzia.

If you sign this form, we may collect any or all of the following information about you:

- Personal information such as name, address, and date of birth
- Social Security number ONLY IF you are being paid to be in this study
- Your health information if required for this study. This may include a review of your medical records and test results from before, during and after the study from any of

your doctors or health care providers. This may include mental health care records, substance abuse records, and/or HIV/AIDS records.

Who will see your private information?

- The researchers to make sure they can conduct the study the right way, observe the effects of the study and understand its results
- People or groups that oversee the study to make sure it is done correctly
- The sponsor(s) of this study, and the people or groups it hires to help perform or review this research
- Insurance companies or other organizations that may need the information in order to pay your medical bills or other costs of your participation in the study
- Tax reporting offices (if you are paid for being in the study)
- People who evaluate study results, which can include sponsors and other companies that make the drug or device being studied, researchers at other sites conducting the same study, and government agencies that provide oversight such as the Food and Drug Administration (FDA) if the study is regulated by the FDA.
- If you tell us that someone is hurting you, or that you might hurt yourself or someone else, the law may require us to let people in authority know so they can protect you and others.

Some of the people outside of UVa who will see your information may not have to follow the same privacy laws that we follow. They may release your information to others, and it may no longer be protected by those laws.

The information collected from you might be published in a medical journal. This would be done in a way that protects your privacy. No one will be able to find out from the article that you were in the study.

A description of this clinical trial will be available on *http:// www.ClinicalTrials.gov,* as required by U.S. Law. This Web site will not include information that can identify you. At most, the Web site will include a summary of the results. You can search this Web site at any time.

What if you sign the form but then decide you don't want your private information shared?

You can change your mind at any time. Your permission does not end unless you cancel it. To cancel it, please send a letter to the researchers listed on this form. Then you will no longer be in the study. The researchers will still use information about you that was collected before you ended your participation.

A copy of this consent form will be put in your medical record. (This is not the same as the record of this research study.) This means that everyone who is allowed to see your medical records will be able to find out that you are in this study. This is done so your

regular doctors will know what you receive as part of this study. If you have other health problems during the study, they will be able to treat you properly.

Please contact the researchers listed below to:

- Obtain more information about the study
- Ask a question about the study procedures or treatments
- Report an illness, injury, or other problem (you may also need to tell your regular doctors)
- Leave the study before it is finished
- Express a concern about the study

Principal Investigator: Edie Barbero

P.O. Box 800826

UVA School of Nursing

Charlottesville, VA 22903

Telephone: (434)960-7475

What if you have a concern about this study?

You may also report a concern about this study or ask questions about your rights as a research subject by contacting the Institutional Review Board listed below.

University of Virginia Institutional Review Board for Health Sciences Research
PO Box 800483
Charlottesville, Virginia 22908

Telephone: 434-924-9634

When you call or write about a concern, please give as much information as you can. Include the name of the study leader, the IRB-HSR Number (at the top of this form), and details about the problem. This will help officials look into your concern. When reporting a concern, you do not have to give your name.

Signatures

What does your signature mean?

Before you sign this form, please ask questions about any part of this study that is not clear to you. Your signature below means that you have received this information and all your questions have been answered. If you sign the form it means that you agree to join the study. You will receive a copy of this signed document.

Consent From Adult

_____	_____	_____
PARTICIPANT (SIGNATURE)	PARTICIPANT (PRINT)	DATE

To be completed by participant if 18 years of age or older.

Person Obtaining Consent

By signing below you confirm that you have fully explained this study to the potential subject, allowed them time to read the consent or have the consent read to them, and have answered all their questions.

_____	_____	_____
PERSON OBTAINING CONSENT (SIGNATURE)	PERSON OBTAINING CONSENT (PRINT)	DATE

Consent from Impartial Witness

If this consent form is read to the subject because the subject is blind or illiterate, an impartial witness not affiliated with the research or study doctor must be present for the consenting process and sign the following statement. The subject may place an X on the Participant Signature line above.

I agree the information in this informed consent form was presented orally in my presence to the **identified individual(s)** who has had the opportunity to ask any questions he/she had about the study. I also agree that the **identified individual(s)** freely gave their informed consent to participate in this trial.

_____	_____	_____
IMPARTIAL WITNESS (SIGNATURE)	IMPARTIAL WITNESS (PRINT)	DATE

Notification of My Health Care Provider

Please indicate below whether you want us to notify your health care provider that you have agreed to take part in this study.

_____ Yes, I want the study doctor to notify my health care provider that I have agreed to take part in this study.

Health Care Provider Name:
Health Care Provider Address:
Study team will send a copy of the consent form to the health care provider.

_____ No, I do not want the study doctor to notify my health care provider that I have agreed to take part in this study or I do not have a health care provider.

Appendix D

Delaware Nurses Association Submission Guidelines

The *DNA Reporter* welcomes unsolicited manuscripts by DNA members. Articles are submitted for the exclusive use of the *DNA Reporter*. All submitted articles must be original, not having been published before, and not under consideration for publication elsewhere. Submissions will be acknowledged by e-mail or a self-addressed stamped envelope provided by the author. All articles require a cover letter requesting consideration for publication. Each article should be prefaced with the title, author(s) names, educational degrees, certification or other licenses, current position, and how the position or personal experiences relate to the topic of the article. Include affiliations. Manuscripts should not exceed five (5) typewritten pages and include APA format. Also include the author's mailing address, telephone number where messages may be left, and fax number.

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Appendix E

Submission Guidelines for Journal of the American Psychiatric Nurses Association

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1. title
2. author names, degrees, affiliations, and contact information (name, address, e-mail address, and phone number)
3. author disclosure or conflict of interest information
4. author roles in research/writing of manuscript
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2. abstract
3. key words
4. text
5. references
6. tables and table captions
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