Published in final edited form as:

Mindfulness (N Y). 2016 August ; 7(4): 866–873. doi:10.1007/s12671-016-0525-9.

The relationship between mindfulness and compulsive sexual behavior in a sample of men in treatment for substance use disorders

Ryan C. Shorey¹, Joanna Elmquist², Michael J. Gawrysiak³, Scott Anderson⁴, and Gregory L. Stuart²

¹Ohio University, Department of Psychology

²University of Tennessee – Knoxville, Department of Psychology

³Delaware State University

⁴Cornerstone of Recovery

Abstract

Substance use disorders (SUDs) are a serious worldwide problem. Despite years of research on the treatment of SUDs, relapse remains high. One factor that may complicate SUDs treatment for some patients is compulsive sexual behavior. Factors that are related to both SUDs and compulsive sexual behavior could be targeted in SUDs treatment. In the current study, we examined dispositional mindfulness, a protective factor for a range of mental health problems, and its relationship to compulsive sexual behavior in a SUDs treatment sample. This is the first study to examine this relationship in a SUDs sample. Medical records from men in residential SUDs treatment were reviewed for the current study ($N = 271$). Upon admission to treatment, men completed self-report measures on alcohol and drug use, dispositional mindfulness, and compulsive sexual behavior. Bivariate correlations demonstrated dispositional mindfulness to be negatively associated with a variety of indicators of compulsive sexual behavior. After controlling for alcohol and drug use and problems in hierarchical regression analyses, which were both associated with compulsive sexual behaviors, dispositional mindfulness remained negatively associated with all of the compulsive sexual behavior indicators. Our results provide the first empirical association between dispositional mindfulness and compulsive sexual behavior in a SUDs sample. Although continued research is needed in this area, our findings suggest that it may be beneficial for SUDs treatment to incorporate mindfulness-based interventions for individuals with comorbid compulsive sexual behavior.

Keywords

Alcohol; drugs; mindfulness; compulsive sexual behavior; substance use

Corresponding Author: Ryan C. Shorey, Ph.D., Assistant Professor, Ohio University, Department of Psychology, 239 Porter Hall Athens, Ohio 45701, Phone: (740) 597-3298, shorey@ohio.edu.

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

Introduction

Substance use disorders (SUDs) are a serious and prevalent problem worldwide (Grant et al., 2015; Whiteford et al., 2013). Despite an abundance of research on risk and protective factors for SUDs (e.g., Kendler, Prescott, Myers, & Neale, 2003; Swendsen et al., 2010), as well as research on SUDs treatment (e.g., Bowen et al., 2014; Carroll & Onken, 2014), relapse rates following SUDs treatment remains high (Walitzer & Dearing, 2006). Factors that may complicate SUDs treatment outcomes include comorbid mental health problems (Bradizza, Stasiewicz, Paas, 2006). One comorbid mental health problem that has received only minimal attention with SUDs, but may negatively impact treatment outcomes and increase the risk for relapse, is compulsive sexual behavior (Elmquist, Shorey, Anderson, & Stuart, in press). Indeed, research suggests that there is high comorbidity between SUDs and compulsive sexual behavior (Sussman, Lisha, & Griffiths, 2011) and that untreated compulsive sexual behavior may increase the risk for relapse, due to substances being used to cope with the shame associated with these behaviors (Schneider & Irons, 2001). Due to this, it is important for research to examine factors that may influence both problems; these factors could be targeted in treatment programs. Toward this end, recent research has examined the relationship between mindfulness and SUDs, as well as between mindfulness and hypersexual behavior, which is similar to compulsive sexual behavior. However, we are unaware of any research that has examined the relationship between mindfulness and compulsive sexual behavior in a SUDs sample.

Mindfulness is commonly defined as “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (Kabat-Zinn, 1994, p. 4). Theoretically, mindfulness allows individuals to experience feelings, thoughts, and behaviors with awareness, non-judgmentally, and non-defensively (Heppner et al., 2008). With mindfulness, thoughts and feelings are allowed to naturally arise and fall away, and efforts to remove unpleasant thoughts or feelings or engage in reactive behavior, is diminished (Segal, Williams, & Teasdale, 2002). Over time, mindfulness may become a “way of being” that permeates all aspects of living (Kabat-Zinn, 2003).

In the current study, we examined mindfulness as a disposition. Dispositional mindfulness can be conceptualized as a naturally occurring individual characteristic, or trait, which can be ascertained through self-report measures that assess individual tendencies to have sustained awareness and attention to what occurs in the present moment of everyday life (Bowen & Enkema, 2014; Brown & Ryan, 2003). Not surprisingly, research has found that dispositional mindfulness, and mindfulness-based interventions which attempt to increase dispositional mindfulness through various mindfulness meditation practices, are associated with a wealth of positive mental and physical health outcomes, such as decreased rumination and worry, decreased depression, and increased subjective well-being (Eberth & Sedlmeier, 2012; Gu, Strauss, Bond, & Cavanagh, 2015; Keng, Smoski, & Robins, 2011).

Recently, there has been increased attention on mindfulness in SUDs populations. For instance, research has shown that dispositional mindfulness is lower among individuals in SUDs treatment relative to the general population (Dakwar, Mariani, & Levin, 2011; Shorey, Brasfield, Anderson, & Stuart, 2014). Bowen and Enkema (2014) found that dispositional

mindfulness was negatively associated with substance use dependence severity in men and women enrolled in outpatient SUDs treatment. Moreover, Mindfulness-Based Relapse Prevention (MBRP; Bowen et al., 2009), an 8-week outpatient group therapy for SUDs, has been shown to reduce substance use 12-months post-treatment to a greater degree than traditional Relapse Prevention (Marlatt & Gordon, 1985) and a 12-step based intervention (Bowen et al., 2014). Therefore, mindfulness interventions are an important consideration among individuals in treatment for substance use.

Compulsive sexual behaviors (CSBs) can be defined as “a clinical syndrome characterized by the experience of sexual urges, fantasies, and behaviors that are recurrent, intense, and a distressful interference in one’s daily functioning” (Miner, Coleman, Center, Ross, & Rosser, 2007). Specifically, CSBs encompasses problems with preoccupation with thoughts surrounding sexual behavior, loss of control over sexual behavior, disturbances in relationships due to sexual behavior, and disturbances in affect (e.g., shame) due to sexual behavior (Carnes, Green, & Carnes, 2010). It is estimated that in the general population the prevalence of CSBs range from 3% to 17% (Cooper, Delmonico, & Burg, 2000; McKeague, 2014; Roller, 2004) and is a chronic problem (Grant, Potenza, Levine, & Kim, 2005). This wide range in the prevalence of CSBs is largely due to different terminology (e.g., hypersexual behavior; sexual addiction) and assessment techniques used in the literature, which is likely due to CSBs not being acknowledged as a diagnosable mental health disorder in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychological Association, 2013). Thus, for the purposes of the current study, we have decided to utilize the term “CSBs” to be consistent with the terminology used in the assessment measure used in the current study (Carnes et al., 2010), as well as recent research (Karim & Chaudhri, 2012; Najavits et al., 2014).

Related to SUDs, it is estimated that 40-60% of individuals with CSBs also meet diagnostic criteria for a SUDs (Sussman et al., 2011). There are a number of theoretical explanations for this high level of comorbidity between CSBs and SUDs. First, it has been theorized that individuals who engage in CSBs may use substances to cope with negative feelings (e.g., shame, guilt) that they may experience as a result of their sexual behavior and resulting negative consequences (McKeague, 2014). Moreover, it is possible that individuals with both CSBs and SUDs have a difficult time tolerating negative affect, which may lead to both SUDs and CSBs. Second, the high comorbidity between CSBs and SUDs may be due to “cross-addiction,” which is defined as the cycling between multiple, different, addictive behaviors, and which is prevalent among individuals in treatment for SUDs (McKeague, 2014). It is also plausible that both SUDs and CSBs have similar etiological factors, such as impulsivity, which is known to be associated with both problems (Raymond, Coleman, & Miner, 2003; Verdejo-Garcia, Lawrence, & Clark, 2008). Thus, it is clear that CSBs and SUDs co-occur at high rates, warranting continued research on their association.

To date, there is a dearth of research on the relationship between dispositional mindfulness and CSBs, and no known research on this association among individuals in treatment for SUDs. Reid, Bramen, Anderson, and Cohen (2014) examined the relationship between dispositional mindfulness and hypersexual behavior, which is similar to CSBs and is defined as “a phenomenon involving repetitive and intense preoccupation with sexual fantasies,

urges, and behaviors, leading to adverse consequences and clinically significant distress or impairment in social, occupational, or other important areas of functioning” (p. 314), in a sample of male hypersexual patients and non-clinical controls. Findings demonstrated dispositional mindfulness to be negatively associated with hypersexual behavior, even after controlling for impulsivity. Similar findings were observed among men reporting hypersexual behavior at outpatient clinics where hypersexual behavior negatively associated with self-compassion, an important component of mindfulness (Reid, Temko, Moghaddam, & Fong 2014). In addition, in a community sample of male and female adults, Spinella, Martino, and Ferri (2013) demonstrated dispositional mindfulness to be negatively associated with CSBs. Thus, there is a small literature demonstrating dispositional mindfulness to be negatively associated with CSBs among non-SUDs populations.

There are empirical and theoretical reasons to suspect that mindfulness will also be inversely associated with CSBs among men in treatment for SUDs. Theoretically, mindfulness is believed to exert its beneficial influence through a number of mechanisms, including increased self-control and emotion regulation, and reduced impulsivity (e.g., Hill & Updegraff, 2012), all of which are problems associated with various indicators of CSBs (Kafka, 2010; Reid, Stein, & Carpenter, 2011). Consequently, it is speculated that mindfulness-based interventions may be beneficial for individuals with hypersexual behavior (Reid, Bramen et al., 2014). Moreover, as the empirical literature demonstrates mindfulness to be associated with reduced substance use severity (Bowen & Enkema, 2014) and lower hypersexual behavior (Reid, Bramen, et al., 2014) and CSBs in a community sample (Spinella et al., 2013), and research also demonstrates a high comorbidity between SUDs and CSBs (Sussman et al., 2011), it stands to reason that mindfulness would be negatively associated with CSBs in a SUDs population.

In the current study we investigated the relationship between dispositional mindfulness and CSBs among men in residential treatment for SUDs. This study is important as it is the first known investigation of this relationship in a population at-risk for a high co-occurrence between CSBs and SUDs. Based on prior research demonstrating negative associations between dispositional mindfulness and CSBs, and similar behaviors, in non-SUDs populations, as well as theory suggesting their association, we hypothesized that CSBs would be inversely associated with dispositional mindfulness. We hypothesized this relationship would be found even after controlling for alcohol and drug use and problems, known correlates of CSBs, due to the strong theoretical link between dispositional mindfulness and CSBs.

Method

Participants

The current study sample consisted of 271 men in residential SUDs treatment. The primary diagnoses for this sample included alcohol dependence (54.5%), opioid dependence (17.9%), and polysubstance dependence (14.9%). The remaining patients had a mix of primary substance use diagnoses (e.g., cannabis dependence; amphetamine dependence). The mean age of patients was 40.86 ($SD = 10.65$). The mean number of years of education completed was 13.83 ($SD = 2.10$). The majority of patients were non-Hispanic Caucasian

(91.0 %). This sample is a subsample of men reported on elsewhere (Elmqvist, Shorey, Anderson, & Stuart, 2015).

Procedures

Male patient medical records between March 2013 and April 2014 from a private residential SUDs treatment facility, located in the Southeastern United States, were reviewed and utilized for the current study. All medical records during this time period were included and there were no exclusion criteria. To be admitted into residential treatment at this facility patients must be 18 years of age or older and have a primary SUD. The residential treatment program is approximately 28-30 days and largely follows a traditional 12-step (abstinence-based) model. Upon admission to the facility, and after medical detoxification (if necessary), patients complete a battery of self-report measures to aid in their treatment (discussed below). Diagnoses were based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition – Text Revision (DSM-IV-TR) criteria (American Psychiatric Association, 2000). All substance use diagnoses are made through consultation and the consensus of a licensed psychologist, a psychiatrist, a general physician, and substance abuse counselors. As part of their treatment informed consent, patients are informed that their medical records may be de-identified and utilized for research. All procedures were approved by the Institutional Review Board.

Measures

Dispositional Mindfulness—The Mindful Attention Awareness Scale (MAAS), 14-item version, was employed to assess dispositional mindfulness (Brown, West, Loverich, & Biegel, 2011). The MAAS, one of the most widely used measures of dispositional mindfulness, is designed to measure a receptive state of mind, in which awareness of what is taking place in the present moment is simply observed, without appraising or evaluating experience. The MAAS has demonstrated good psychometric properties. A mean score is obtained by summing all items, which are rated on a 6-point Likert scale (*1 = Almost always; 6 = Almost never*), and dividing by the total number of items. Higher scores correspond to greater dispositional mindfulness.

Compulsive Sexual Behaviors—CSBs were measured with the Sexual Addiction Screening Test-Revised (SAST-R; Carnes et al., 2010). The SAST-R consists of 45 self-report items that screen for possible CSBs. A SAST Core scale is designed to capture four dimensions thought to be early indicators of addiction, including preoccupation (obsessive thoughts of sexual behavior), loss of control (inability to stop/control sexual behavior), relationship disturbance (sexual behavior has caused problems in relationships), and affect disturbance (e.g., depression, anxiety due to sexual behavior; Carnes et al., 2010). These four areas can also be examined individually. Thus, in the current study we utilized the following SAST-R subscales: Preoccupation (e.g., “Has sex (or romantic fantasies) been a way for you to escape your problems?”), Loss of Control (e.g., “Do you ever think your sexual desire is stronger than you are?”), Relationship Disturbance (e.g., “Has your sexual behavior ever created problems for you and your family?”), Affect Disturbance (e.g., “Do you ever feel bad about your sexual behavior?”), and Core (a combination of all subscales). The SAST-R has additional subscales (e.g., Internet items), and we decided to only utilize

the above four subscales due to the preliminary nature of the current study. All items are answered using a “yes”/“no” format, with items endorsed as “yes” coded as “1” and items endorsed as “no” coded as “0.” Total scores were obtained by summing all items within each respective subscale. SAST-R has evidence of adequate reliability and validity (Carnes et al., 2010).

Alcohol Use and Problems—The Alcohol Use Disorders Identification Test (AUDIT; Saunders, Asaland, Babor, de la Fuente, & Grant, 1993), which contains 10-items, assessed alcohol use and problems in the year prior to treatment. The AUDIT measures the frequency of alcohol use, symptoms that might indicate tolerance to alcohol, and negative consequences of alcohol use. The AUDIT is a widely used measure of alcohol use and problems with good psychometric properties (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001).

Drug Use and Problems—The Drug Use Disorders Identification Test (DUDIT; Stuart, Moore, Kahler, & Ramsey, 2003; Stuart et al., 2004), a 14-item measure, assessed drug use in the year prior to treatment. The DUDIT measures the frequency of drug use, symptoms that may indicate tolerance, and negative consequences associated with drug use across 7 different types of drugs (cannabis, cocaine, hallucinogens, stimulants, sedatives/hypnotics/anxiolytics, opiates, and other substances [e.g., steroids, inhalants]). The DUDIT has good psychometric properties (Stuart et al., 2004).

Data Analytic Plan

All analyses were conducted using SPSS version 18.0. We first examined all variables for normal or skewed distributions and whether demographic characteristics were associated with the variables of interest. Next, bivariate correlations among study variables were examined. Lastly, we conducted hierarchical multiple regression analyses to examine whether dispositional mindfulness remained associated with CSBs after controlling for alcohol and drug use and problems. This was done in two steps. In the first step, alcohol and drug use and problems were entered as predictors of CSBs. In the second step, dispositional mindfulness was added as a predictor of CSBs. This was done for each indicator for CSBs separately.

Results

We first examined all study variables for skew and kurtosis, with results demonstrating all SAST-R subscales were positively skewed and kurtotic. Thus, these variables were log-transformed prior to analyses to reduce skew and kurtosis. Next, we examined whether demographic characteristics were associated with the SAST-R subscales, and results demonstrated that age and years of education were not significantly associated with any subscale. Thus, these demographic variables were not included in additional analyses.

Table 1 displays bivariate correlations, means, and standard deviations among study variables. As displayed, dispositional mindfulness was negatively and significantly associated with all five SAST-R subscales. Alcohol use was positively and significantly associated with all five SAST-R subscales, whereas drug use was only positively and

significantly associated with the relationship disturbance subscale. Both alcohol and drug use were negatively and significantly associated with dispositional mindfulness.

The findings for the hierarchical multiple regression analyses are displayed in Table 2. As displayed, dispositional mindfulness remained a significant predictor of each indicator of CSBs (i.e., Core, Preoccupation, Loss of Control, Relationship Disturbance, and Affect Disturbance) after controlling for the effects of alcohol and drug use and problems. Alcohol use remained positively associated with all indicators of CSBs and drug use was positively associated with the Core and Affect Disturbance indicators of CSBs.

Discussion

Recent research has demonstrated a high comorbidity between SUDs and compulsive sexual behaviors (CSBs) in the general population (Sussman et al., 2011), and recent research has begun to examine CSBs in SUDs treatment populations (e.g., Elmquist et al., in press). Moreover, dispositional mindfulness has been observed to negatively associate with CSBs in the general population (e.g., Spinella et al., 2013) and substance use among individuals in treatment for SUDs (Bowen & Enkema, 2014). Additionally, mindfulness-based interventions are known to improve SUDs treatment outcomes (Bowen et al., 2014). Thus, in the current study we investigated the relationship between dispositional mindfulness and CSBs in a sample of men in residential treatment for SUDs. Findings supported our hypothesis that dispositional mindfulness would negatively associate with CSBs.

Specifically, findings demonstrated that dispositional mindfulness was negatively associated with the CSBs subscales of affective disturbance, loss of control, preoccupation, and relationship disturbance (as well as the combination of these subscales), even after controlling for alcohol and drug use and problems, which are known correlates of CSBs. These findings are important for several reasons, such as adding to the growing literature on the potential beneficial effects of high levels of dispositional mindfulness among individuals in SUDs treatment. Although our findings should be considered preliminary until replicated and extended, this is the first study to demonstrate dispositional mindfulness to be negatively associated with CSBs in a sample of men in SUDs treatment.

From a theoretical standpoint, it makes sense that dispositional mindfulness would be negatively associated with CSBs. That is, mindfulness is believed to exert its beneficial effects by enhancing emotion regulation, impulse control, and decreasing reactive behavior (Baer, 2003), which are all counter to CSBs. It is possible that higher levels of dispositional mindfulness reduce thoughts about CSBs in general, thus reducing actual engagement in CSBs. However, it is also possible that higher levels of dispositional mindfulness reduce impulsive and reactive behavior when faced with thoughts about engaging in CSBs. Future research will need to clarify this distinction, although our preliminary study adds to the growing literature suggesting that dispositional mindfulness is associated with lower CSBs/hypersexual behavior.

As this is the first study to examine the relationship between dispositional mindfulness and CSBs in a SUDs sample, there are a number of avenues for future research. One area for

future research is to investigate mediators of the relationship between dispositional mindfulness and CSBs. Theoretically and empirically, lower dispositional mindfulness is associated with higher levels of impulsivity (Peters, Erisman, Upton, Baer, & Roemer, 2011), impulsivity is associated with increased substance use (Verdejo-Garcia et al., 2008), and impulsivity is associated with CSBs (Raymond et al., 2003). Thus, impulsivity may be one possible mediator of this relationship.

Another area for future research on the intersection between SUDs, CSBs, and dispositional mindfulness is the examination of these relationships in more diverse samples that utilize different methodological designs. For instance, our study only examined male residential SUDs patients. However, women in SUDs treatment also evidence high comorbidity with CSBs (Sussman et al., 2011) and benefit from mindfulness-based interventions (Bowen et al., 2014). Thus, it is plausible that the relationships identified in the current study would also be evident in women. It will also be important for research to examine this relationship among individuals who are not in SUDs treatment, as it is possible this relationship is only evident for individuals with more severe substance use problems (e.g., individuals in treatment). Moreover, longitudinal studies are needed to determine whether these relationships hold up over time, as well as to clarify the potential causal relationships among SUDs, CSBs, and dispositional mindfulness.

Finally, we believe that it will be important for future research to examine whether concurrent treatment for SUDs and CSBs is effective, as preliminary research in this area suggests some success when both problems are treated concurrently (i.e., Hartman, Ho, Armour, Hambley, & Lawson, 2012). Specifically, we believe it would be fruitful for future research to examine whether mindfulness-based interventions are effective at treating this comorbidity. First, research demonstrates that mindfulness-based interventions enhance dispositional mindfulness (Bowen et al., 2009). Second, research has demonstrated mindfulness-based interventions to be effective in reducing substance use after treatment (Bowen et al., 2014). Third, it has been proposed that mindfulness-based interventions may be effective for problems similar to CSBs (i.e., Reid et al., 2014), which is further supported by recent theoretical writings on mindfulness-based interventions being appropriate across diagnostic categories (Greeson, Garland, & Black, 2014). It will be important for future research to determine whether mindfulness-based interventions need to be developed specifically for CSBs and comorbid SUDs, or whether general mindfulness-based programs (e.g., Mindfulness-Based Stress Reduction; Mindfulness-Based Relapse Prevention; Bowen et al., 2009; Kabat-Zinn, 1990) are effective for this problem.

Limitations

There are several limitations that should be addressed in future research. We utilized a cross-sectional chart review methodology, hindering our ability to determine causation among study variables. Longitudinal research is therefore needed to determine whether deficits in dispositional mindfulness precede and increase the risk for SUDs/CSBs. The generalizability of our findings is limited and future research should examine these relationships in non-treatment seeking populations and more diverse treatment samples, as the majority of the patients included were Caucasian. Diagnostic interviews were not conducted by the

treatment facility to confirm substance use diagnoses, or to establish non-substance use diagnoses (e.g., personality disorders, depression), which should be utilized in future research to provide greater confidence in diagnoses. The assessment measures also had limitations. The MAAS, although widely used, only examines one specific aspect of dispositional mindfulness: moment-to-moment awareness. Other self-report measures of dispositional mindfulness capture different aspects of this complex construct (e.g., non-judgment, non-reactivity; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) and future research would be improved with the inclusion of more comprehensive measures of dispositional mindfulness. Similarly, there are additional measures of CSBs, and similar constructs (e.g., hypersexual behavior), which would be fruitful for future research to include (e.g., Carnes et al., 2012; Miner et al., 2007), as the measure utilized in the current study includes items that would not reflect CSBs (e.g., items about childhood sexual abuse). Due to the chart review nature of the current study, we did not have access to individual items for each self-report measure, and are therefore unable to report internal consistencies for our measures. Finally, as there is no agreed upon criteria for CSBs, the assessment of this construct is limited.

In summary, this is the first study to examine the relationship between dispositional mindfulness and CSBs in a sample of men in residential treatment for SUDs. This research is important due to the high comorbidity between SUDs and CSBs, recent research suggesting an empirical and theoretical relationship between CSBs and mindfulness, as well as research demonstrating mindfulness-based interventions are effective for the reduction of substance use. Pending replication and extension by future research, this research suggests that mindfulness-based interventions should be investigated for individuals with comorbid SUDs and CSBs.

Acknowledgments

Compliance with Ethical Standards: Funding: This work was supported, in part, by grant K24AA019707 from the National Institute on Alcohol Abuse and Alcoholism (NIAAA) awarded to the last author. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIAAA or the National Institutes of Health.

References

- American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th. Washington, DC: American Psychiatric Publications; 2000. text rev
- American Psychological Association (Ed.). Diagnostic and statistical manual of mental disorders: DSM-IV-5. Washington, DC: American Psychiatric Publications; 2013.
- Baer RA. Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice*. 2003; 10(2):125–143.
- Baer RA, Smith GT, Hopkins J, Krietemeyer J, Toney L. Using self-report assessment methods to explore facets of mindfulness. *Assessment*. 2006; 13(1):27–45. [PubMed: 16443717]
- Bowen S, Enkema MC. Relationship between dispositional mindfulness and substance use: Findings from a clinical sample. *Addictive Behaviors*. 2014; 39(3):532–537. [PubMed: 24290208]
- Bowen S, Chawla N, Collins SE, Witkiewitz K, Hsu S, Grow J, et al. Marlatt A. Mindfulness-based relapse prevention for substance use disorders: a pilot efficacy trial. *Substance Abuse*. 2009; 30(4): 295–305. [PubMed: 19904665]
- Bowen S, Witkiewitz K, Clifasefi SL, Grow J, Chawla N, Hsu SH, et al. Larimer ME. Relative efficacy of mindfulness-based relapse prevention, standard relapse prevention, and treatment as usual for

substance use disorders: a randomized clinical trial. *JAMA Psychiatry*. 2014; 71(5):547–556. [PubMed: 24647726]

Bradizza CM, Stasiewicz PR, Paas ND. Relapse to alcohol and drug use among individuals diagnosed with co-occurring mental health and substance use disorders: a review. *Clinical Psychology Review*. 2006; 26(2):162–178. [PubMed: 16406196]

Brown KW, Ryan RM. The Benefits of Being Present: Mindfulness and Its Role in Psychological Well-Being. *Journal of Personality and Social Psychology*. 2003; 84(4):822–848. [PubMed: 12703651]

Brown KW, West AM, Loverich TM, Biegel GM. Assessing adolescent mindfulness: validation of an adapted Mindful Attention Awareness Scale in adolescent normative and psychiatric populations. *Psychological Assessment*. 2011; 23(4):1023–1033. [PubMed: 21319908]

Carnes P, Green B, Carnes S. The same yet different: Refocusing the Sexual Addiction Screening Test (SAST) to reflect orientation and gender. *Sexual Addiction & Compulsivity*. 2010; 17:7–30.

Carnes PJ, Green BA, Merlo LJ, Polles A, Carnes S, Gold MS. PATHOS: A brief screening application for assessing sexual addiction. *Journal of Addiction Medicine*. 2012; 6:29–34. [PubMed: 21817915]

Carroll KM, Onken LS. Behavioral therapies for drug abuse. *American Journal of Psychiatry*. 2014; 162(8):1452–1460. [PubMed: 16055766]

Cooper A, Delmonico DL, Burg R. Cybersex users, abusers, and compulsives: New findings and implications. *Sexual Addiction & Compulsivity*. 2000; 7:5–29.

Dakwar E, Mariani JP, Levin FR. Mindfulness impairments in individuals seeking treatment for substance use disorders. *The American Journal of Drug and Alcohol Abuse*. 2011; 37(3):165–169. [PubMed: 21410417]

Eberth J, Sedlmeier P. The effects of mindfulness meditation: a meta-analysis. *Mindfulness*. 2012; 3(3):174–189.

Elmqvist J, Shorey RC, Anderson SE, Stuart GL. The relationship between early maladaptive schemas and eating-disorder symptomatology among individuals seeking treatment for substance dependence. *Addiction Research & Theory*. 2015; 23:429–436. [PubMed: 27375373]

Elmqvist J, Shorey RC, Anderson S, Stuart GL. The relation between compulsive sexual behaviors and aggression in a substance-dependent population. *Journal of Aggression, Maltreatment, & Trauma*. In press.

Grant BF, Goldstein RB, Saha TD, Chou SP, Jung J, Zhang H, et al. Hasin DS. Epidemiology of DSM-5 alcohol use disorder: results from the National Epidemiologic Survey on Alcohol and Related Conditions III. *JAMA Psychiatry*. 2015; 72:757–766. [PubMed: 26039070]

Grant JE, Levine L, Kim D, Potenza MN. Impulse control disorders in adult psychiatric inpatients. *American Journal of Psychiatry*. 2005; 162:2184–2188. [PubMed: 16263865]

Greeson, J.; Garland, EL.; Black, D. Mindfulness: a transtherapeutic approach for transdiagnostic mental processes. In: Le, A.; Ngunoumen, CT.; Langer, EJ., editors. *The Wiley Blackwell Handbook of Mindfulness*. West Sussex, UK: Wiley; 2014. p. 531-562.

Gu J, Strauss C, Bond R, Cavanagh K. How do mindfulness-based cognitive Therapy and mindfulness-based stress reduction improve mental health and wellbeing? A systematic review and meta-analysis of mediation studies. *Clinical Psychology Review*. 2015; 37:1–12. [PubMed: 25689576]

Hartman LI, Ho V, Arbour S, Hambley JM, Lawson P. Sexual addiction and substance addiction: Comparing sexual addiction treatment outcomes among clients with and without comorbid substance use disorders. *Sexual Addiction & Compulsivity: The Journal of Treatment & Prevention*. 2012; 19:284–309.

Heppner WL, Kernis MH, Lakey CE, Campbell WK, Goldman BM, Davis PJ, Cascio EV. Mindfulness as a means of reducing aggressive behavior: Dispositional and situational evidence. *Aggressive Behavior*. 2008; 34(5):486–496. [PubMed: 18464229]

Hill CL, Updegraff JA. Mindfulness and its relationship to emotional regulation. *Emotion*. 2012; 12(1): 81–90. [PubMed: 22148996]

Kabat-Zinn, J. *Full catastrophe living: The program of the stress reduction clinic at the University of Massachusetts Medical Center*. New York: Delta; 1990.

- Kabat-Zinn, J. Wherever you go, there you are: Mindfulness meditation in everyday life. Hyperion; 1994.
- Kabat-Zinn J. Mindfulness-based interventions in context: past, present, and future. *Clinical Psychology: Science and Practice*. 2003; 10(2):144–156.
- Kafka MP. Hypersexual disorder: A proposed diagnosis for DSM-V. *Archives of Sexual Behavior*. 2010; 39(2):377–400. [PubMed: 19937105]
- Karim R, Chaudhri P. Behavioral addictions: An overview. *Journal of Psychoactive Drugs*. 2012; 44:5–17. [PubMed: 22641961]
- Kendler KS, Prescott CA, Myers J, Neale MC. The structure of genetic and environmental risk factors for common psychiatric and substance use disorders in men and women. *Archives of General Psychiatry*. 2003; 60(9):929–937. [PubMed: 12963675]
- Keng SL, Smoski MJ, Robins CJ. Effects of mindfulness on psychological health: A review of empirical studies. *Clinical Psychology Review*. 2011; 31(6):1041–1056. [PubMed: 21802619]
- Marlatt, GA.; Gordon, JR. *Relapse Prevention: Maintenance strategies in addictive behavior change*. New York, NY: Guilford; 1985.
- McKeague EL. Differentiating the Female Sex Addict: A Literature Review Focused on Themes of Gender Difference Used to Inform Recommendations for Treating Women With Sex Addiction. *Sexual Addiction & Compulsivity*. 2014; 21:203–224.
- Miner MH, Coleman E, Center BA, Ross M, Rosser BS. The compulsive sexual behavior inventory: Psychometric properties. *Archives of Sexual Behavior*. 2007; 36:579–587. [PubMed: 17192832]
- Najavits L, Lung J, Froias A, Paull N, Bailey G. A study of multiple behavioral addictions in a substance abuse sample. *Substance Use & Misuse*. 2014; 49:479–484. [PubMed: 24304172]
- Peters JR, Erisman SM, Upton BT, Baer RA, Roemer L. A preliminary investigation of the relationships between dispositional mindfulness and impulsivity. *Mindfulness*. 2011; 2(4):228–235.
- Raymond NC, Coleman E, Miner MH. Psychiatric comorbidity and compulsive/impulsive traits in compulsive sexual behavior. *Comprehensive Psychiatry*. 2003; 44(5):370–380. [PubMed: 14505297]
- Reid RC, Brame JE, Anderson A, Cohen MS. Mindfulness, emotional dysregulation, impulsivity, and stress proneness among hypersexual patients. *Journal of Clinical Psychology*. 2014; 70(4):313–321. [PubMed: 23852856]
- Reid RC, Stein JA, Carpenter BN. Understanding the roles of shame and neuroticism in a patient sample of hypersexual men. *The Journal of Nervous and Mental Disease*. 2011; 199(4):263–267. [PubMed: 21451351]
- Reid RC, Temko J, Moghaddam JF, Fong TW. Shame, Rumination, and Self-Compassion in Men Assessed for Hypersexual Disorder. *Journal of Psychiatric Practice*. 2014; 20(4):260–268. [PubMed: 25036581]
- Roller CG. Sex addiction and women: A nursing issue. *Journal of Addictions Nursing*. 2004; 15:53–61.
- Saunders JB, Asaland OG, Babor TF, de la Fuente JR. Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption: II. *Addiction*. 1993; 86:791–804. [PubMed: 8329970]
- Schneider JP, Irons RR. Assessment and treatment of addictive sexual disorders: Relevance for chemical dependency relapse. *Substance Use & Misuse*. 2001; 36(13):1795–1820. [PubMed: 11795580]
- Segal, ZV.; Williams, JMG.; Teasdale, JD. *Mindfulness-based cognitive therapy for depression: A new approach to relapse prevention*. New York: Guilford; 2002.
- Shorey RC, Brasfield H, Anderson S, Stuart GL. Mindfulness deficits in a sample of substance abuse treatment seeking adults: A descriptive investigation. *Journal of Substance Use*. 2014; 19(1-2): 194–198. [PubMed: 24707192]
- Stuart GL, Moore TM, Kahler CW, Ramsey SE. Substance abuse and relationship violence among men court-referred to batterers' intervention programs. *Substance Abuse*. 2003; 24:107–122. [PubMed: 12766378]

- Stuart GL, Moore TM, Ramsey SE, Kahler CW. Hazardous drinking and relationship violence perpetration and victimization in women arrested for domestic violence. *Journal of Studies on Alcohol*. 2004; 65:46–53. [PubMed: 15000503]
- Sussman S, Lisha N, Griffiths M. Prevalence of the addictions: A problem of the majority or the minority? *Evaluation & the Health Professions*. 2011; 34:3–56. [PubMed: 20876085]
- Swendsen J, Conway KP, Degenhardt L, Glantz M, Jin R, Merikangas KR, et al. Kessler RC. Mental disorders as risk factors for substance use, abuse and dependence: results from the 10-year follow-up of the National Comorbidity Survey. *Addiction*. 2010; 105:1117–1128. [PubMed: 20331554]
- Verdejo-García A, Lawrence AJ, Clark L. Impulsivity as a vulnerability marker for substance-use disorders: review of findings from high-risk research, problem gamblers and genetic association studies. *Neuroscience & Biobehavioral Reviews*. 2008; 32(4):777–810. [PubMed: 18295884]
- Walitzer KS, Dearing RL. Gender differences in alcohol and substance use relapse. *Clinical Psychology Review*. 2006; 26(2):128–148. [PubMed: 16412541]
- Whiteford HA, Degenhardt L, Rehm J, Baxter AJ, Ferrari AJ, Erskine HE, et al. Burstein R. Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010. *The Lancet*. 2013; 382:1575–1586.

Table 1

Bivariate correlations, means, and standard deviations among study variables.

	1.	2.	3.	4.	5.	6.	7.	8.
1. AUDIT	---	-.24***	-.18**	.26***	.20**	.20**	.22***	.21***
2. DUDIT		---	-.21***	.11	.07	.11	.10	.18**
3. MAAS			---	-.32***	-.28***	-.22***	-.23***	-.22***
4. SAST Core Items				---	.84***	.69***	.77***	.76***
5. SAST Affect Disturbance					---	.59***	.49***	.63***
6. SAST Loss of Control						---	.52***	.58***
7. SAST Preoccupation							---	.48***
8. SAST Relationships								---
<i>M</i>	16.03	11.10	4.19	1.57	.49	.25	.41	.34
<i>SD</i>	11.65	13.21	1.04	2.96	1.06	.78	.76	.81
Range	0-40	0-70	1.43-6	0-17	0-5	0-4	0-4	0-4

Note: AUDIT = alcohol use disorders identification test; DUDIT = drug use disorders identification test; MAAS = mindful attention awareness scale; SAST = sexual addiction screening test. Means and standard deviations for all SAST scores are presented as raw scores.

* $p < .05$,

** $p < .01$,

*** $p < .001$

Table 2
Hierarchical multiple regression analyses predicting compulsive sexual behavior

	Core Items β	Affect Disturbance β	Loss of Control β	Preoccupation β	Relationship Disturbance β
Model 1	$R^2 = .10$ $F = 15.72^{***}$	$R^2 = .05$ $F = 7.96^{***}$	$R^2 = .06$ $F = 9.96^{***}$	$R^2 = .07$ $F = 10.84^{***}$	$R^2 = .10$ $F = 14.91^{***}$
AUDIT	.31 ^{***}	.23 ^{***}	.25 ^{***}	.26 ^{***}	.26 ^{***}
DUDIT	.19 ^{***}	.12 [*]	.17 ^{**}	.16 ^{**}	.24 ^{***}
Model 2	$R^2 = .16$ ($R^2 = .06$) $F = 16.91^{***}$	$R^2 = .11$ ($R^2 = .06$) $F = 10.47^{***}$	$R^2 = .09$ ($R^2 = .03$) $F = 8.96^{***}$	$R^2 = .10$ ($R^2 = .03$) $F = 9.81^{***}$	$R^2 = .12$ ($R^2 = .02$) $F = 11.77^{***}$
AUDIT	.24 ^{***}	.17 ^{**}	.21 ^{**}	.22 ^{***}	.23 ^{***}
DUDIT	.12 [*]	.06	.12 [*]	.11	.21 ^{**}
MAAS	-.25 ^{***}	-.24 ^{***}	-.16 [*]	-.16 ^{**}	-.14 [*]

Note: AUDIT = alcohol use disorders identification test; DUDIT = drug use disorders identification test; MAAS = mindful attention awareness scale; SAST = sexual addiction screening test.

* $p < .05$,
** $p < .01$,
*** $p < .001$