

Mindfulness-Based Relapse Prevention (MBRP-R12) for Substance Misuse: A Feasibility Study

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Declaration

This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

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STATEMENT 1

This thesis is the result of my own investigations, except where otherwise stated. Where correction services have been used, the extent and nature of the correction is clearly marked in a footnote(s). Other sources are acknowledged by footnotes giving explicit references. A bibliography is appended.

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Abstract

Background: Relapse is common after substance misuse treatment. Mindfulness-based interventions have been shown to reduce substance misuse and related psychological problems, and mechanisms of action have been examined. The current study hypothesised increased mindfulness and decreased craving after MBRP training, and that relationships found in previous studies may be replicated in a naturalistic setting, where training and supervision are sub-optimal.

Method: 36 subjects were recruited and 10 completed treatment. Measures before and after completing a modified, 12-week rolling version of MBRP were examined for significance. For maximum environmental validity, a naturalistic, pre-post, non-controlled methodology was employed.

Results: At baseline, significant positive correlations were found between mindfulness and positive affect. Mindfulness also negatively correlated with both negative affect and craving. Mindfulness practice was found to positively correlate with increase in mindfulness scores, which, along with quality-of-life significantly improved over the treatment period.

Conclusions: The findings of this study offer inferential support to the acceptability and effectiveness of delivering modified MBRP in UK treatment settings, even if staff training and supervision are sub-optimal. Hypotheses that were confirmed, as well as those that failed to achieve significance, are both discussed, and clinical implications and directions for future research are suggested. This study also offers important guidance for conducting future studies in this challenging setting.

Introduction

Addiction is an international problem that has been termed a “chronic relapsing condition” (Harrison & Scarpitti, 2002). Mindfulness training draws on meditative traditions and has been used as an intervention for a wide range of problems, including aftercare treatment for addiction. While evidence from randomised controlled trials shows potential efficacy for this intervention, real world implementations often look different to experimental conditions. This study will explore evidence supporting the validity of experimental trials, and the feasibility of this modality as an intervention in a UK drug treatment agency.

There are, however, diverse definitions of addiction: a European Monitoring Centre of Drugs and Drug Addiction (EMCDDA) report points out that all definitions of addiction involve “...the notion of repeated powerful motivation to engage in an activity with no survival value, acquired through experience with that activity, despite the harm or risk of harm it causes” (West, 2013). This definition includes the more obvious addictions such as compulsive drug and alcohol abuse and nicotine dependence, but also behavioural compulsions that are generally accepted as addictions in society, such as obsessive gambling.

Each year, 3.3 million deaths (5.9% of global mortality) are attributed to alcohol misuse (WHO, 2014), and approximately 27 million people (0.6% of the global adult population) use drugs problematically, killing about 200,000 people every year (UNODC, 2012). Health and finances, families and societies are all impacted by addiction, and the criminality associated with many addictive behaviours further compounds the aggregated harms of addiction (West, 2013).

Ten percent of the European population are estimated to have some form of addiction to a substance with negative health consequences (Andlin-Sobocki, Jönsson,

Wittchen, & Olesen, 2005). Tobacco is cited as the most common form of addiction, while illicit drug dependence is identified as the least prevalent form of addiction (Andlin-Sobocki, et al., 2005). Alcohol and drug related harm in the United Kingdom has been estimated to have a combined financial cost to society of £36.3 billion (HM Government, 2012; National Audit Office, 2010). The overall cost of illegal drug use in the U.S. (not including alcohol) has been estimated at as much as \$193 billion, including loss of work, crime, and health costs, which includes over \$3 billion in direct addiction treatment expenditure, and a further \$11 billion attributed to additional health costs (National Drug Intelligence Center, 2011). Additionally, other addictive behaviours such as smoking and gambling similarly contribute a financial and social burden to society. It is therefore prudent to explore the most effective way to reduce the harmful consequences of addiction.

A range of evidence-based treatments for drug misuse have been shown to be effective for a variety of drug problems in different settings; positively affecting levels of drug use, the spread of disease, overdose risks, and offending behaviour (Department of Health, 2007). While between a third and a quarter of treatment recipients may attain sustained abstinence after two years (Gossop, Marsden, Stewart, & Treacy, 2001), relapse to substances within a year of treatment is estimated to be in excess of 60% (McLellan, Lewis, O'Brien, & Kleber, 2000). This figure rises to 75% in respect of gambling addiction (Hodgins, Currie, el-Guebaly, & Diskin, 2007). Offering reliable treatment for addictive behaviours has historically been a challenging endeavour. The combined financial and societal cost, as well as harm caused to individuals and families, warrants investment in research and the development of more effective interventions to support recovery from addictive behaviours. One such promising intervention is the application of mindfulness training as a relapse prevention strategy.

The term 'mindfulness' as used in a modern psychological context, draws its roots from a meditation practice outlined in Buddhist literature dating back over two thousand years. 'Mindfulness' has become the standard translation of an ancient Indian Pali word 'Sati', which more literally translates as 'memory', but was given new meaning in Buddhist teaching to summarise a practice and state that Bodhi (2011) characterises as 'lucid awareness'. The Buddhist practice of 'Sati' or mindfulness is qualified as "right mindfulness", in which a practitioner "... dwells contemplating the body in the body, ardent, clearly comprehending, mindful, having removed covetousness and displeasure in regard to the world" (Bodhi, 2000). This way of attending to experience in the body is applied to four areas as "foundations" of mindfulness; the body, feelings, mind and phenomena (Bodhi, 2000). These four foundations of mindfulness outlined in early Buddhist texts have arguably, either explicitly or implicitly, found their way into modern interpretations offered in secular contexts for both the alleviation of clinical symptoms and for general wellbeing. A commonly quoted definition of mindfulness in this context is offered by the principal pioneer of modern, secular mindfulness, Jon Kabat-Zinn, "Paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally" (Kabat-Zinn, 1994, p4). The direct contemplation of body, feelings and mind with equanimity, are clearly shared in the ancient definition of mindfulness (Sati) and its modern expression (Bodhi, 2011).

The mindfulness training programme initially developed by Jon Kabat-Zinn in his Mindfulness-Based Stress Reduction (MBSR) course is a teacher-led programme. It is delivered to a closed group over eight weeks, usually two and a half hours each week, in addition to a single 'retreat' day of mindfulness practice. Daily home practice is an important part of the course (Blacker, Meleo-Meyer, Kabat-Zinn, & Santorelli, 2009).

Pre-course interviews are commonly used to screen people to ensure there is sufficient motivation to commit to the course requirements.

Despite an acknowledged limit of high quality studies, meta-analysis indicates that MBSR is effective in reducing a wide range of clinical and non-clinical problems (Grossman, Niemann, Schmidt, & Walach, 2004). A number of variants of the course have been developed for specific clinical and non-clinical populations as diverse as school children, cancer patients, and military (McCown, Reibel, & Micozzi, 2011), but the majority follow the weekly eight session format and use similar meditation practices. As a whole, mindfulness-based interventions have been found to be an effective treatment for a variety of psychological problems, in particular when used to reduce anxiety, stress, or depression; they have also shown lower attrition rates than more traditional cognitive behavioural treatments (Khoury et al., 2013).

The most successful adaptation of MBSR is Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2002) which was modified by combining it with an accepted Cognitive Behavioural Therapy (CBT) framework and techniques to prevent depression relapse. Its robust evidence base (Teasdale, Segal, Ridgeway, & Soulsby, 2000) helped it find its way into national guidelines for clinical practice (NICE, 2009). Like MBCT, Mindfulness-Based Relapse Prevention (MBRP; Bowen, Chawla & Marlatt, 2010) has taken the basic format of MBSR and adapted it to a similar degree. MBRP includes elements of cognitive-behavioural relapse prevention for addictive behaviours (Marlatt & Donovan, 2005) and like MBCT, is intended to be offered to clients in periods of remission or as aftercare.

The effectiveness of mindfulness training in substance misuse treatment is becoming evident (Chiesa & Serretti, 2014). Bowen and her colleagues conducted a pilot, randomised controlled trial (RCT) (N=168; Bowen et al., 2009) and larger scale

full RCT (n=286; Bowen et al., 2014) testing MBRP. This addressed criticisms of earlier research into mindfulness-based meditation techniques for addictive behaviours that they lacked randomised controls (Chiesa & Serretti, 2014).

Bowen and other's pilot study compared MBRP with treatment as usual (TAU), which consisted of a twelve step support group offered over a similar four month time scale. This study collected extensive data on alcohol and drug use, craving, consequences, as well as quantity of mindfulness practice, acceptance, mindfulness scores plus sub-factors and feedback from participants. A number of measures were used so that mechanisms could be explored in secondary, follow-up studies. Results indicated an increase in mindfulness levels as well as significant reductions in craving as measured by the Penn Alcohol Craving Scale (PACS; Flannery, Volpicelli, & Pettinati, 1999). It also found significant reductions in alcohol and drug use. Significant findings were maintained at two month follow-up, but the effect was lost after four months. It was postulated that the lack of consistent post-intervention support and the fact that clients returned to TAU and were not encouraged to continue their personal mindfulness practice may explain the drop-off in effect.

The subsequent full trial (Bowen et al., 2014) improved on methodological limitations of the previous study by including an existing evidence-based modality as one of the control conditions, and by extending follow-up to 12 months. Clients were randomised to one of three conditions: MBRP, standard Relapse Prevention (RP) or TAU. At six months, drug and drinking days for the RP and MBRP groups were reduced over TAU, but after 12 months, RP effects were no longer significantly distinguishable from TAU; however, the MBRP participants maintained their gains with a significant 31% reduction in drug using days over the standard RP control group. These results are particularly promising when compared with Contingency

Management (CM), one of the few psychosocial interventions for substance misuse recommended in UK national guidelines (NICE, 2007). Contingency Management (CM), which rewards clean drug tests with vouchers or prizes, received unequivocal support from NICE (2007). However, its effectiveness has been shown to decay after three months ($d = 0.33$), and after six months lose all detectable effects ($d=-0.09$) (Benishek, et al., 2014).

The mechanisms of how mindfulness training on the MBRP programme successfully transforms addictive behaviour have been the subject of investigation in follow-up studies from previous efficacy trials. Bowen et al.'s (2009; 2014) experiments collected sufficient data to support a number of secondary analyses. These studies showed that MBRP may prevent depression from triggering craving and the associated substance misuse (Witkiewitz & Bowen, 2010). In addition, the frequency and quantity of client mindfulness practice between sessions and therapeutic relationship both correlated with improved mindfulness in clients in the short-term (Bowen & Kurz, 2012). Long-term positive substance use outcomes were more strongly related to greater levels of post-course mindfulness practice (Grow, Collins, Harrop, & Marlatt, 2015), suggesting that what sustains outcome may change over time. Interestingly, of the sub-domains of mindfulness measured by the Acceptance and Action Questionnaire (AAQ; Hayes, Strosahl, Wilson, & Bissett, 2004) and the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2008), only when the three domains of non-judgement, awareness and acceptance all scored highly, were mindfulness scores found to mediate between receiving MBRP and craving reduction (Witkiewitz, Bowen, Douglas & Hsu, 2013). These three domains in isolation, and other domains, did not seem to have a mediating effect between receiving MBRP and craving. This suggests that when in evidence together, these particular domains of

mindfulness may be of importance when working with addictive behaviours.

Adaptations of the MBRP model have received minimal research attention, although notably, and of particular relevance to this study, a rolling version of the MBRP programme was developed and tested with racial and ethnic minority women. This study found that this adapted, rolling version of MBRP may still be more effective than standard Relapse Prevention (Witkiewitz, Greenfield & Bowen, 2013).

Although efficacy studies show that MBRP can be effective in experimental conditions where staff are well trained, and participants may be financially rewarded for attendance and for each questionnaire completed; real world settings usually do not have these ideal conditions. There is rarely any cash or voucher incentive to complete forms or attend sessions as there was in the Bowen et al. (2014) study. Historically, workers dealing with substance misuse clients have often been poorly trained, supervision has been sub-optimal (Hall, Amodeo, Shaffer & Vander-Bilt, 2000; Maslin et. al., 2001), and the effective transporting of complex evidence-based models to community settings has not always been successful (Henggeler, Schoenwald, Liao, Letourneau, & Edwards, 2002).

An additional complicating factor in implementing research models into community settings is the common requirement that state funded agencies take in clients who are not ideal for treatment. For example, agencies must accept less motivated clients who might be mandated for treatment by a court order as an alternative to a custodial sentence. If they are less motivated, they are less likely to take up home practices (Helbig & Fehm, 2004), and so may be less likely to benefit from the intervention (Bowen & Kurz, 2012; Grow, Collins, Harrop & Marlatt, 2015).

It has long been known that treatment motivation is predictive of treatment participation and recovery (De Leon, Melnick, & Kressel, 1997; Simpson & Joe, 1993);

however, there has been little research on the effect of motivation on engagement with mindfulness practice. A unique potential this research hoped to highlight was examining the effects of motivation on mindfulness practice engagement. It was intended that by identifying if or how motivation for treatment and engagement with the mindfulness aspect of the programme might be related to engagement in mindfulness practice, important clinical implications may be drawn.

The impact of motivation on programme completion (Simpson & Joe, 1993), and evidence that treatment completion is associated with a reduction in the need for psychiatric inpatient care, increased abstinence and reduced conviction/incarceration rates (Wallace & Weeks, 2004; McMurrin & Theodosi, 2007), invites exploration of motivation for, and acceptability of mindfulness as an intervention for this client group.

Therefore, research is needed to explore whether MBRP is still accepted and effective under typical conditions in community settings.

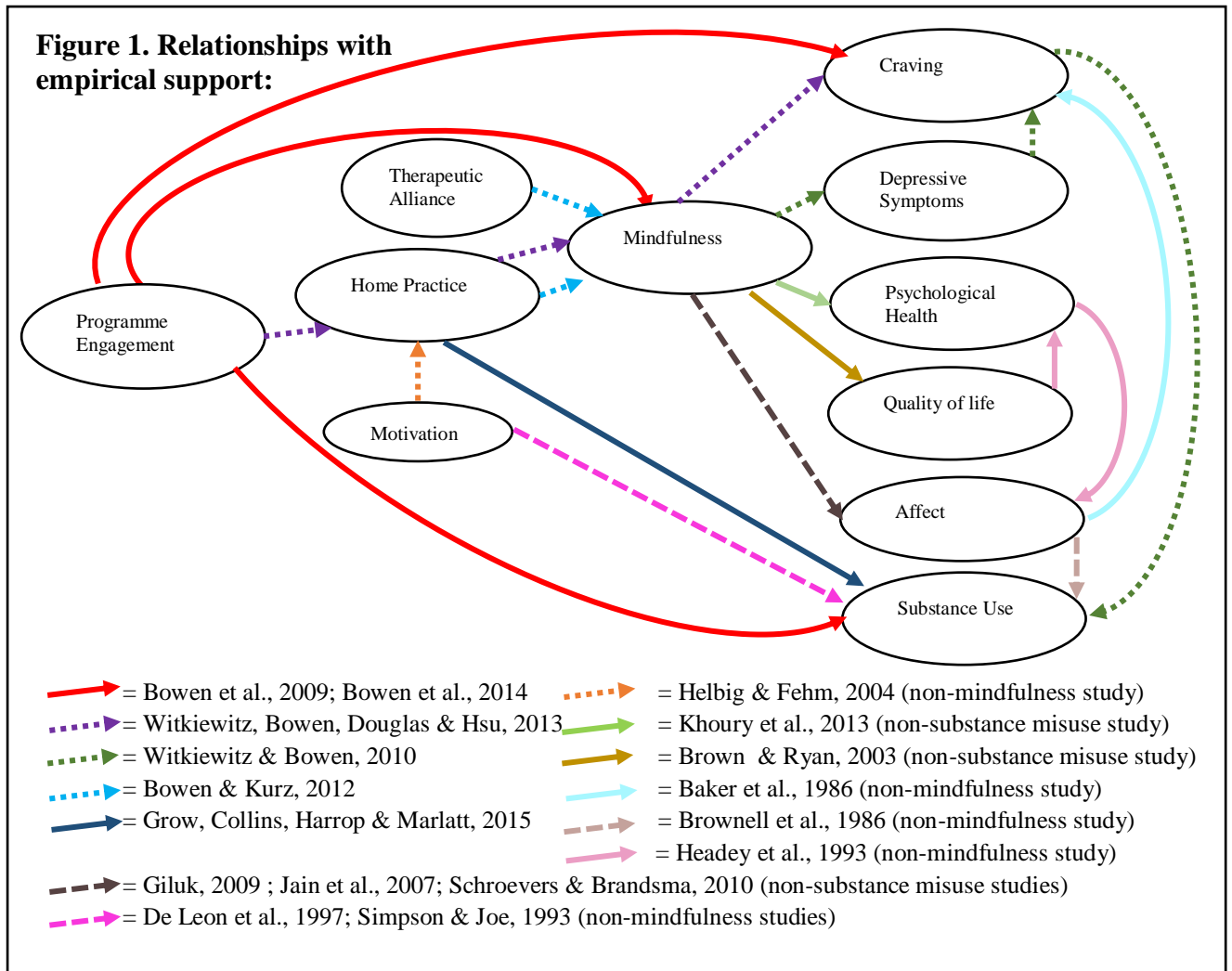


Figure 1: is presented to summarise key relationships, which have been evidenced, that may inform the mechanisms of mindfulness and relapse prevention.

The dissonance between experimental and real-world MBRP practice warrants an investigation into the potential helpfulness of actual implementation of MBRP with clients typical of those entering treatment for addictive behaviours in the UK. This study will investigate an adapted formulation of MBRP in a UK agency setting, to examine if there is any similarity with underlying mechanisms evidenced in larger studies (see Figure 1). Studies such as this can either lend support to the idea that MBRP is still likely to be effective when rolled out into community agencies, or

highlight limitations of following non-standard treatment protocols and using staff with limited training and supervision.

The aim of this feasibility study is to examine the acceptability of an adapted, real-world implementation of MBRP to support addiction aftercare. Data is presented on demographics, retention rates, frequency of home practice, pre-course motivation, and evaluation scores. Pre- and post-treatment data are also presented on mindfulness, craving, psychological health, quality of life and positive and negative affect.

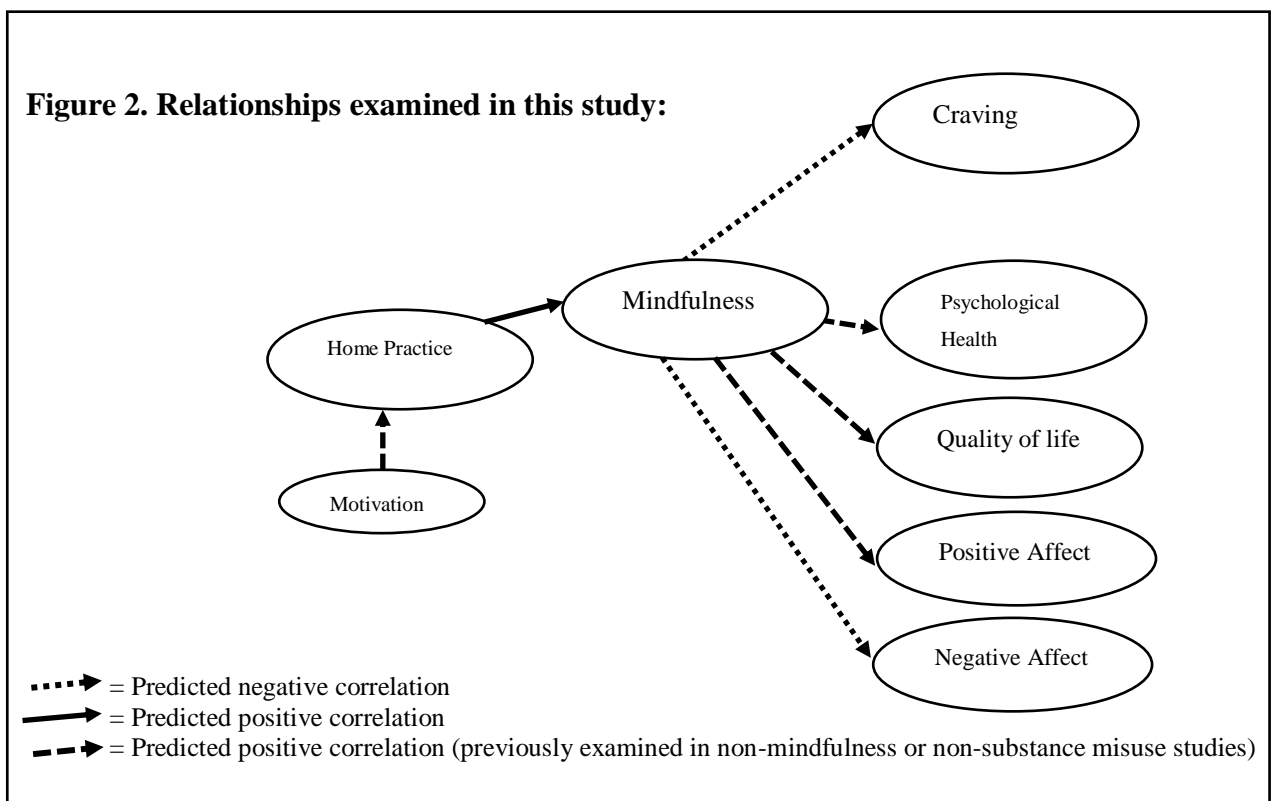
Hypotheses

Selected relationships from the studies summarised in Figure 1 were examined in this study, to test six hypotheses that take the position that offering adapted MBRP in this setting would mirror results in previous studies:

1. There will be positive correlations between mindfulness and
 - a. psychological health,
 - b. quality of life and
 - c. positive affect.
2. There will be negative correlations between the mindfulness domains of non-judgement and awareness and
 - a. negative affect and
 - b. craving.
3. Mindfulness, psychological health, quality of life and positive affect will be increased post-treatment.
4. Negative affect and craving will be reduced post-treatment.
5. There will be a positive correlation between pre-treatment motivation and mindfulness meditation practice.

6. There will be a positive correlation between mindfulness meditation practice and
 - a. gain in overall mindfulness scores.
 - b. gain in the mindfulness domains of non-judgement and awareness

These hypotheses were examining how mechanisms outlined in Figure 1 operate in implementations of MBRP that more closely resemble its delivery in UK treatment agencies. Figure 2 presents the relationships that were intended to be tested.



Feasibility data was collected that included client characteristics, motivation, retention rates, home practice uptake, and satisfaction with the mindfulness aspect of their treatment programme.

Method

Study Situation and Participants

The Community Recovery programme was established in 2002 and runs an ongoing, rolling version of MBRP, called MBRP-R12 as part of their structured day treatment programme. Participants were drawn from this group, which is an aftercare service for those in early recovery from addiction, the majority of whom have received a medicated detox immediately prior to treatment. Service users sign up after being referred by a Drug and Alcohol Action Team (DAAT). They may have chosen to engage voluntarily or have been sent by a court as an alternative to a prison sentence. It is required that all clients entering the programme abstain from illicit drugs and alcohol for the duration of their treatment. Community Recovery operates five days a week, 09:15 to 16:15 Monday to Thursday and 09:15 to 13:30 on Friday (see Appendix 1 for details).

Clients access treatment at no cost to themselves (funding is provided by the local DAAT). They must be over 18 years of age and be resident in the local authority region. Prior to commencing treatment, an assessment procedure screens prospective clients. The primary criteria for unsuitability are significant risk of harm to self or others during treatment; secondary to this, clients may be excluded if they are deemed unlikely to benefit from treatment due to poor motivation or lack of ability to engage with the treatment. There are no gender restrictions or exclusions based on specific diagnosis, but rather individuals are admitted on their individual presentations.

Because clients often initially agree to treatment while still under the influence of mind-altering substances, as soon as they join the programme, clients receive an Intake Interview with a staff member at the agency, which lasts up to an hour. Here a

short talk is delivered outlining the treatment programme and reminding them of the commitments to which they registered.

36 participants were recruited to the research programme (83% male and 17% female) who ranged in age from 28 to 64 years old ($M=45.1$ years, $SD=9.3$ years). Participants were largely White British (86%) with the balance Black British (14%). 25% had no educational qualifications, 36% GCSE/'O' level, 14% 'A' level, 8% Foundation Degree/HND, 11% Honours degree and 6% had a post graduate qualification. The treatment programme was full time, so 88% were either unemployed or not working due to disability, 3% were engaged in voluntary work, 3% self-employed, 3% employed part-time and 3% retired. Participants generally reported being on a low income, 92% were on benefits, or had an income lower than £11,999 per annum, 6% had an income of £12,000 - £19,999 and 3% didn't know their income. The majority (64%) of participants were single, 19% were divorced, 11% lived with a partner and 6% were married.

Procedure

Recruitment. Clients who joined the treatment programme; were invited to participate in the research project by trained staff at the Community Recovery agency, on the first day, during their Intake Interview. As such, there were no exclusion criteria. Clients were presented with an information sheet (Appendix 2) describing the research project and how they could access research findings online following completion of the programme. It was explained to research participants that they could withdraw from the research at any time without consequence to themselves. They were given time to ask questions and consider participation in the research programme with the option to take the information home and consider it before receiving a consent form (Appendix 3), which they could sign if agreeing to participate. Those who agreed to

have their data included in the research project had identical treatment to those declining to be part of the research, as similar questionnaires were collected from all clients for evaluation purposes whether they became research participants or not.

After signing the consent form, trained staff at the agency supported participants to complete a set of questionnaires to form a baseline assessment. Once completed clients then joined the treatment programme at the current stage in its rolling format. Participants joined others on the programme, who had already been in treatment for up to eleven weeks. They then completed their own twelve-week programme before graduating. Upon completion, agency staff supported clients to fill in post-treatment questionnaires (12 weeks after baseline). Participants were considered to have completed treatment if they answered end questionnaires and attended MBRP eight out of twelve weeks during their treatment. Attrition rate was recorded.

Intervention. The intervention examined has been called MBRP-R12, as it is based on the original MBRP manual (Bowen, Chawla, & Marlatt, 2010) but rolling over a 12-week programme. This manual outlines a delivery pattern spanning eight weekly two-hour sessions in a closed group format. Community Recovery has adapted this model in a way typical of day treatment programmes in the UK. Their version of MBRP abandoned the closed-group approach to fit in with their existing open, rolling programme and extended this over twelve weeks to match the period of client engagement. In the open format, clients might begin any week between one and twelve, complete their weekly one and a half hour MBRP session along with other therapeutic interventions that form part of their treatment for twelve weeks before completing and leaving the programme. MBRP sessions included up to a half-hour mindfulness meditation session, enquiry into their mindfulness practice, discussions and workshop style exercises focused on relapse prevention. In addition, each session started with a

review of the previous week's home practice assignment (working with recorded audio guidance of a daily mindfulness practice of between 15 – 30 minutes).

The MBRP-R12 programme was designed with the assistance of the MBRP lead authors to maximise compliance with the aims of the standard version: it loses the progressive developmental aspect of the training, but means clients do not have to wait for the next iteration of treatment to start, as is commonly required by commissioning services. The original MBRP themes for sessions were preserved in the adapted version, but spread over the 12-week period with a few key practices such as 'urge surfing' repeated and an extra session on interpersonal mindfulness added. Other activities with which clients engaged, alongside the adapted MBRP programme, included: diary keeping, community discussion groups, interpersonal group therapy (four each week), optional cognitive-behavioural or 12 step support, "working recovery" (a workshop-based creative skills session), a support and gender group, optional family support, a community theatre group and written assignments. A guided mindfulness practice was offered for 30 minutes once a week to give clients an opportunity to engage with at least one of their daily mindfulness home practice exercises in a group setting (see Appendix 1 for details). The adapted MBRP sessions featured in this investigation were offered weekly, for 90 minutes in the morning. Themes of the sessions included: "automatic-pilot" and how this relates to relapse, awareness of sensations, emotions and thoughts, triggers and high-risk situations as well as bringing mindfulness into everyday life, self-care, and social support. All clients completed pre- and post-treatment questionnaires regardless of research participation status. These questionnaires were generally completed with the aid of staff at the agency, usually on, or as near as possible to the first and last day of treatment during the initial interview and at an exit interview.

Measures

Demographic information was collected during the intake interview via a questionnaire developed for clinical assessment purposes. Level of motivation for taking part in the complete Community Recovery programme as well as level of motivation for training in mindfulness was measured (Appendix 4). Four core measures were utilised at both pre- and post-treatment points to analyse changes over time. To measure changes in sub-domains of mindfulness, a Five Facet Mindfulness Questionnaire-Short Form (FFMQ-SF; Bohlmeijer, Peter, Fledderus, Veehof, & Baer, 2011) was used (Appendix 5). This is a 24-item measure that scores for Observation, Description, Acting with Awareness, Non-judgement, and Non-reactivity. This measure has been tested for use with adult populations and is evidenced as sensitive, valid, and reliable (Bohlmeijer, et al., 2011). Crucially, it differentiates particular domains of mindfulness (Acting with Awareness & Non-judgement) that have been found to play a mediating role between engaging with MBRP and craving (Witkiewitz, Bowen, Douglas, & Hsu, 2013).

The second pre-post questionnaire is the Treatment Outcome Profile (TOP; Marsden et al, 2008; Appendix 6), a standard evaluation tool used in statutory funded addiction treatment services throughout the UK, including questions such as “Client’s rating of psychological health status (anxiety, depression and problems with emotions and feelings). It is a twenty-item instrument that has been validated and reliably records demographic information, substance use, quality of life, and health related data through self-reports (Marsden et al, 2008).

The final pre- and post-treatment form consisted of a 5-item questionnaire, the Penn Craving Scale (PCS; Flannery, Volpicelli, & Pettinati, 1999; Appendix 7). This measure has been adapted slightly so that it is appropriate for measuring craving for any

substance, not just alcohol. For example, in the first question, the words “*doing drugs or*” were added to the question to make it “How often have you thought about *doing drugs or* drinking, or about how good that would make you feel during this period?”. In tests, the PCS has been found to have good construct and predictive validity, and internal consistency has also been evidenced (Flannery, Volpicelli, & Pettinati, 1999). The PCS form included an adapted version of the Positive And Negative Affect Schedule (PANAS; Watson, Clark & Tellegen, 1988) The original version has been found to be internally consistent, with high convergent and discriminant correlations with longer measures of both positive and negative moods (Watson, Clark & Tellegen, 1988). The adaptation to the original version is explored in the discussion section of this paper and in Appendix 8.

Post-treatment, participants were invited to complete a Meditation Record questionnaire developed for the purposes of the study, which asks participants to estimate their average mindfulness meditation practice over the period of the programme, with which practices they engage, and for how long (Appendix 9). Acceptability of the MBRP programme is assessed using a custom-made evaluation questionnaire that collects both qualitative and quantitative data (Appendix 10). Supported sessions in which clients completed measures, took less than thirty minutes on or as close as possible to the first and last day of their treatment.

Research Design & Analysis

The research design is primarily quantitative and uncontrolled, using pre and post measures to collect data that was analysed to evaluate changes in measures and correlations between variables of interest. Feasibility was assessed using an evaluation questionnaire to calculate quantitative and qualitative satisfaction with the intervention. Dropout rates, home practice compliance, and client demographics were recorded.

Descriptive statistics were calculated to check data normality. T-tests were conducted to compare completer and non-completer as well as male and females groups to see if there were significant differences at baseline. Possible impacts of the intervention such as reductions in craving and negative affect, increases in mindfulness, and improvements in positive affect, psychological health and quality of life, were determined.

Ethical Considerations

This study gained ethical approval from Bangor University. Because clients are in recovery and therefore no longer actively using drugs or alcohol when referred to the relapse prevention programme, they are not being referred on the basis of an existing diagnosis. Therefore it is not necessary to obtain approval from a NHS Research Ethics Committee. Treatment is offered in a building managed by an addiction charity that offers the service (not NHS premises). The charity has given permission. Approval has also been obtained from the local Drug and Alcohol Action Team/Assessment Team that commission services and refer clients to the project (Appendix 11). An information sheet (Appendix 2) describing the research project was given to clients and they were invited to ask questions and take time before considering signing up to the research project. Those who wish to participate signed an informed consent sheet (Appendix 3) prior to the collection of research data.

Results

Group Comparisons.

Independent samples t-tests were conducted to see if there were differences between completers and non-completers as well as between males and females at baseline. There were no significant differences between completers (N=10) and non-

completers (N=26) at baseline. However, mean scores for completers tended to be marginally higher in age, education level, motivation, psychological health, quality of life, positive affect and mindfulness and lower in substance use, negative affect and craving. The only significant difference ($p=.014$) found between gender groups was that mean age for males (N=30, M=46.1 years, SD=9.78 years) was higher than for females (N=6, M=40.0 years, SD=3.46 years).

Descriptives.

Table 1 shows that all mean variables measured at two time points moved in the predicted directions between Time-1 (T1) at the start of treatment and Time-2 (T2) at the end of treatment, however, not all changes achieved significance.

Table 1
Descriptives

Measure	Variable	T1	T2
		M (SD) N	M (SD) N
TOPS			
	Psychological Health	9.8 (4.8) N=21	13.1 (4.4) N=18
	Quality of Life	11.3 (4.6) N=21	13.0 (4.4) N=18
FFMQ			
	Observe	14.2 (2.9) N=35	15.6 (3.5) N=10
	Describe	16.4 (3.6) N=35	18.0 (2.5) N=10
	Act with Awareness	14.6 (3.7) N=35	16.4 (3.8) N=10
	Non-judge	13.5 (3.2) N=36	14.7 (3.4) N=10
	Non-react	14.7 (3.2) N=35	17.2 (2.5) N=10
	Total Mindfulness	73.3 (9.9) N=35	81.9 (10.1) N=10
PCS-A			
	Craving	10.9 (6.7) N=31	6.8 (6.1) N=10
PANAS-A			
	Mean Positive Affect	3.3 (0.8) N=34	3.6 (0.7) N=10
	Mean Negative Affect	2.7 (1.0) N=33	1.7 (0.8) N=10
Demographics		<i>Time 1 data only</i>	
	Motivation for Programme	6.4 (0.9) N=36	
	Motivation for Mindfulness	6.2 (0.9) N=36	
MR		<i>Time 2 data only</i>	
	Formal Mindfulness Practice	16.2 (25.0) N=10	
	Informal Mindfulness Practice	65.4 (91.0) N=10	
Evaluation		<i>Time 2 data only</i>	
	Importance of course	3.3 (1.7) N=7	
	Continue Formal Practice	3.0 (1.4) N=7	
	Continue Informal Practice	3.6 (1.6) N=7	
	Group Facilitation	4.4 (1.0) N=7	
	Quality of Venue	4.3 (1.2) N=6	

Note. M=Mean, SD=Standard Deviation, N=Number. TOP=Treatment Outcome Profile, FFMQ-SF=Five Facet Mindfulness Questionnaire-Short Form, PCS-A= Adapted-Penn Craving Scale, PANAS-A=Adapted-Positive And Negative Affect Schedule, MR=Meditation Record, Evaluation=Evaluation Forms

Pearson product-moment correlation coefficients examined baseline scores to assess hypothesised correlations between key measures.

Table 2

Correlations Among Primary Constructs

	1	2	3	4
1 Baseline Mindfulness Score	-	-	-	-
2 Baseline N-Judge+Act-Aware	.68 **, N=35	-	-	-
3 Baseline Positive Affect	.35 *, N=34	.07, N=34	-	-
4 Baseline Negative Affect	-.40 *, N=33	-.34 *, N=33	-.16, N=33	-
5 Baseline Craving Score	-.45 **, N=31	-.44 **, N=31	-.31 *, N=31	.36 *, N=30

Note: ** $p \leq .01$, * $p \leq .05$, (one-tailed)

Baseline N-Judge+Act-Aware=combined baseline mindfulness subscales non-judgement+acting with awareness

Table 2 shows that as predicted, there was a positive, significant, but weak correlation between total mindfulness (but not the combined mindfulness domains of non-judgement and acting with awareness) and positive affect. Also as predicted, there was a negative, significant but weak correlation between the combined mindfulness domains of non-judgement and acting with awareness (and total mindfulness) and negative affect. Finally, as hypothesised, there was a negative, significant, moderate correlation between the combined mindfulness domains of non-judgement and acting with awareness and craving.

At the research design stage, no relationship was hypothesised between affect and craving, however, Table 2 shows one-tailed significance for a weak, negative correlation between positive affect and craving and a positive correlation between negative affect and craving. These findings are in-line with previous research (Baker Morse & Sherman, 1986).

Paired-samples t-tests were conducted to compare scores before and after treatment. Three of the hypothesised changes were evidenced in this study. There was a

significant difference in the combined sub-factors of mindfulness, Non-Judgement and Acting with Awareness scores before treatment ($M=27.50$, $SD=5.38$) and after treatment ($M=31.10$, $SD=5.65$); $t(9)=1.96$, $p=.041$ (one-tailed). There was a significant difference in the total mindfulness scores before ($M=75.10$, $SD=7.68$) and after treatment ($M=81.90$, $SD=10.09$); $t(9)=1.91$, $p=.045$ (one-tailed). There was a significant difference in Psychological Health scores before ($M=9.25$, $SD=5.01$) and after treatment ($M=12.92$, $SD=4.44$); $t(11)=2.64$, $p=.012$ (one-tailed).

Four of the original hypothesised changes were not evidenced in this study. The difference in negative affect scores did not achieve significance before treatment ($M=2.51$, $SD=1.19$) and after treatment ($M=1.71$, $SD=0.79$); $t(9)=1.45$, $p=.090$ (one-tailed). There was no significant difference in craving scores before treatment ($M=9.90$, $SD=6.51$) and after treatment ($M=6.80$, $SD=6.07$); $t(9)=1.12$, $p=.146$ (one-tailed). There was no significant difference in Quality of Life scores before treatment ($M=11.67$, $SD=5.11$) and after treatment ($M=12.42$, $SD=4.54$); $t(11)=0.50$, $p=.314$ (one-tailed). Finally, there was no significant difference in positive affect scores before treatment ($M=3.38$, $SD=0.86$) and after treatment ($M=3.64$, $SD=0.70$); $t(9)=0.89$, $p=.198$ (one-tailed).

Pearson product-moment correlation coefficients were computed to assess the hypothesised relationships between key variables and gains and reductions in primary measures. Measure gain was calculated by subtracting T1 scores from T2 scores, measure reduction was calculated by subtracting T2 from T1 scores.

Formal mindfulness meditation practice times were found to have a strong positive correlation with gain in the combined sub-factors of mindfulness, non-judgement and acting with awareness ($r=.70$, $n=10$, $p=.012$) and a moderate (non-

significant) positive correlation with gain in total mindfulness ($r=.40$, $n=10$, $p=.127$). Informal mindfulness meditation practice times were found to have a strong positive correlation with gain in overall mindfulness ($r=.60$, $n=10$, $p=.035$), and a weak (non-significant) positive correlation with gain in the combined sub-factors of mindfulness, non-judgement and acting with awareness ($r=.22$, $n=10$, $p=.272$).

Gain in total mindfulness was not found to significantly positively correlate with reduction in craving ($r=.188$, $n=10$, $p=.301$), gain in positive affect ($r=.204$, $n=10$, $p=.286$), or reduction in negative affect ($r=-.233$, $n=10$, $p=.259$). Gain in the combined sub factors of mindfulness, Non-judgement and Acting with Awareness was not found to significantly positively correlate with reduction in craving ($r=.224$, $n=10$, $p=.267$), gain in positive affect ($r=.105$, $n=10$, $p=.387$), or reduction in negative affect ($r=-.345$, $n=10$, $p=.164$).

Unreliable data collection for psychological health and quality of life at both T1 and T2 prevented these scores from providing meaningful data to calculate Pearson's r , therefore, no evidence for these hypotheses are presented.

Feasibility

Motivation. Motivation for the mindfulness aspect of the programme was found to have a very strong positive correlation with motivation for the programme overall ($r=.87$, $n=36$, $p=.000$).

Attendance. After recruitment, 36 clients attended between 0 and 12 sessions of MBRP-R12 ($M=5.4$ sessions, $SD=4.4$ sessions) prior to leaving or completing the programme. Absence rates at sessions were 17%. Participant drop-out prior to attending 8+ sessions was 67%, 5% completed 8+ sessions but did not fill in ending questionnaires. 10 participants (28%) completed ending questionnaires.

Home practice. Of the 10 programme completers, 70% reported taking part in some formal mindfulness practice in their own time. 10% reported engaging in formal mindfulness practice once a day, 40% reported practicing between once a day and once a week and 20% reported practicing less than once a week. 70% reported taking part in some informal mindfulness practice between sessions, 10% reported engaging in informal mindfulness practice more than once a week, 60% less than once a week. 30% did not take part in any (formal or informal) mindfulness practice in their own time.

Quantitative Evaluation Forms. Of the programme completers, a subset filled in the post-course satisfaction survey and rated a range of questions. Their responses are detailed in Table 3.

Table 3

Evaluation Form part A	Scores
	M (SD)
¹ How important has the course been to you?	3.3 (1.7)
¹ How likely are you to continue regular, formal mindfulness practice?	3.0 (1.4)
¹ How likely are you to continue regular, informal mindfulness practice?	3.6 (1.6)
² The quality of the group facilitation?	4.4 (1.0)
² The quality of the venue?	4.3 (1.2)

N=7

Note. ¹Evaluation scores were on a 5-point Likert scale, with 1 meaning “not” and 5 meaning “very”.

²Evaluation scores were on a 5-point Likert scale, with 1 as "poor" and 5 as "excellent".

Middle scores were received for the importance of the mindfulness aspect of the course and their likelihood to continue formal practice, although slightly higher scores were received for likeliness to engage in informal practice. The highest scores were for the quality of the group facilitation and the quality of the venue.

Qualitative Evaluation Forms. Clients were invited to elaborate on the quantitative feedback given. When asked “How important has the course been for

you?” three participants offered qualitative feedback, all of it positive: one client said “it has enabled me to learn about myself and how my addiction has controlled me”.

Four participants responded to the question “How likely are you to continue regular formal mindfulness practice?” Three answered positively saying it was “useful”, “beneficial” and “helpful”, while one offered a neutral answer, saying they are “open to trying” the practice.

Respondents were asked “How likely are you to continue regular informal mindfulness practice?” Two offered positive feedback saying they “enjoyed walking” practice and it was “positive to be aware”.

The quality of the group facilitation was given positive feedback from three participants, saying it “helped me to practice”, that the “support has been brilliant”, and it was “facilitated well”. One participant offered neutral feedback saying it was “hard to tell” how good the facilitation was.

There were also four questions that were purely qualitative in nature; these were addressed by respondents more fully. Participants were asked: “Please write if there is anything that you particularly valued about the course or learned”. Nine responded, seven positively. Three mentioned the practice being “relaxing” and three suggested that their awareness of thoughts, feelings, behaviours or surroundings had improved; one person also said their confidence had improved. One client said “I have practiced MBRP many times daily over the last 3 months... and will continue to do so”. One participant said they found it “difficult to practice” and another (who gave bottom scores for all quantitative feedback) said they learned “Never to do MBRP”.

Participants were asked “if anything has changed for you over the past 12 weeks?” Eight responded; seven of these responses were positive. Two responses

mentioned being less reactive, two referenced being calmer or less anxious and two highlighted greater awareness. One comment mentioned being more confident and one was simply positive about their life change. Only one person offered a negative comment saying “Not really”

Participants were asked “Was there anything that made the course difficult to engage with?” Nine responded with three saying “No”. Other barriers reported included other people on the course who were not engaging, anxious thoughts, the Body Scan, self-discipline, and one person said that they “Just didn’t enjoy it”.

When asked to suggest improvements to the course, seven people responded. Three said there were no improvements or that it was about right. Others mentioned preferring to lie down during practices, a larger room, more yoga, or including acupuncture.

Discussion

Outliers. Output from descriptives and examination of scatter plots identified a number of outliers in the data, and their relative positions. The majority were so close to other observations that it was decided to leave them untransformed. There was one outlier in each of Formal Mindfulness Practice and Informal Mindfulness Practice that was further from the bulk of the other observations, however, these items appeared to be in-line with the trends of the overall data and were so also left untransformed.

Relationships highlighted in Table 2 will now be discussed.

Motivation -> Home Practice engagement. As no significant correlations were found in relation to motivation in this study, no conclusions can be drawn on this unique aspect of this research. The lack of findings here may be due to a number of factors. It might be that there is no relationship between motivation and home practice,

however, research in a cognitive-behavioural field other than mindfulness (Helbig & Fehm, 2004) suggests that motivation is linked to home practice. It could be that our small study size lacked statistical power to find significance in a relatively small effect size or that the simple measure used for motivation was not sensitive enough. A final proposition is the possibility that the null hypothesis might be due to a lack of training and supervision in staff delivering the model; this could mean the skill needed to turn initial motivation into engagement in home practice was absent, therefore however motivated clients were, this was not effectively capitalised on to increase active participation in homework assignments.

Home Practice → Mindfulness improvement. The significant correlations found in this study between engagement in formal and informal mindfulness meditation practice and increase in mindfulness scores over the treatment period goes some way to support the theory that it is engaging in mindfulness practice that increases the psychological trait of mindfulness. However, without experimental research to more robustly evidence a causal relationship, we cannot discount the possibility of a third confounding factor that both increases engagement in formal and informal mindfulness meditation, and increases mindfulness scores independently. This could be other programme ingredients, such as interpersonal learning developed in group therapy, or increased self-efficacy developed in the cognitive-behavioural relapse prevention sessions. However, given that previous experimental studies (Witkiewitz et al., 2013; Bowen & Kurz, 2012) have presented evidence for a causal link between engagement in mindfulness meditation and increase in mindfulness, it is not an unrealistic supposition that the link between home practice and mindfulness improvement found in other studies is replicated here: that if clients engage in mindfulness practices, they will increase their psychological measures of mindfulness.

Mindfulness -> Craving. Confirmation of the hypothesis that baseline mindfulness scores would negatively correlate with craving at the level $p \leq 0.01$ is consistent with literature evidencing improved levels of mindfulness and reduced craving and related substance use in MBRP participants (Witkiewitz, et al., 2013). Given that the intervention studied significantly raised mindfulness scores in the participants, it might be expected that craving would reduce. However, mean craving scores for the participant group did not significantly reduce over the intervention period and that reductions in craving were not correlated with gain in mindfulness, this therefore fails to evidence the premise that delivering MBRP in this manner is likely to reduce substance use through increasing mindfulness and so reducing craving. One possible explanation for this discrepancy with the literature is that there is no link between mindfulness and craving in this setting. However, the evidence of more methodologically robust studies cannot be ignored, so other explanations must be considered. Failing to find evidence for a decrease in craving in relation to gain in mindfulness does not prove that these constructs are not linked; in fact the baseline correlation suggests they may well be. It is therefore possible that the absence of a positive finding is methodological in nature and that the small number of completers in this study was not large and representative enough to evidence limited effects of mindfulness on craving.

Mindfulness -> Psychological Health and Quality of Life. While the predicted, before and after treatment increases in both mindfulness and psychological health were found to be significant, poor data collection for items on the TOPS form (psychological health and quality of life) meant that correlations between increases could not be meaningfully tested. The study design prevents any causal conclusions from being drawn, but knowing that the programme (which includes a

mindfulness training element) improved self-report psychological health in this cohort is an encouraging finding for this modality of treatment.

Failing to find a significant improvement in quality of life might mean that although people felt that their psychological health improved, this did not translate into an overall improvement in their life situation and quality of life. However, this finding might also be due to methodological shortcomings; such as unreliable data collection for items on the TOPS questionnaire, the small completing sample lacking statistical power to show small differences as significant, and the simplicity and therefore lack of sensitivity of the single item quality of life scale used.

Mindfulness -> Positive and Negative Affect. Finding a positive, significant, if weak correlation between total mindfulness and positive affect at baseline, in addition to finding a negative, significant (but weak) correlation between the combined mindfulness domains of non-judgement and acting with awareness as well as total mindfulness and negative affect, suggests a link between mindfulness and affect, with higher levels of mindfulness being associated with more positive affect and less negative affect. While these constructs appear to have a relationship the methodology of this study prevents proposing a directional causation, however, other studies have provided evidence that affect effects craving in a causal manner (Giluk, 2009 ; Jain et al., 2007; Schroevers & Brandsma, 2010).

The move in positive and negative affect in the predicted directions after treatment not achieving significance, could suggest that the programme did not improve affect. Although it could be speculated from this study that increasing mindfulness levels does not improve affect (raise positive and lower negative), and non-significant improvements in affect will play a role in the failure to find any correlation between

increased mindfulness scores and affect improvements, this is not the findings of other research (Giluk, 2009 ; Jain et al., 2007; Schroevers & Brandsma, 2010). However, previous research was not conducted with recovering substance misuse clients, therefore it is possible that affect is less affected by improvements in mindfulness in this particular client group. It is also possible that the limited training and supervision received by staff delivering the mindfulness intervention had an impact on the effectiveness of mindfulness improving client's mood. Methodological limitations of this study may also play a role in the failure to detect significant improvements in affect, in particular, not using the standard (validated) PANAS measure for affect could have made it less sensitive. In addition, the limited completing sample makes statistical significance harder to achieve and results less reliable and generalizable.

Evaluation & Feasibility. The high score and strong correlation between motivation for the mindfulness aspect of the programme and the overall programme suggests that participants were motivated to engage in mindfulness training. Completion rates in the study fall mid-way between those identified in other intensive outpatient treatment settings which range from 18% (Wickizer, et. al., 1994) to 52% (Stahler, Mennis, & DuCette, 2016) and absence rates were low. Engagement in formal mindfulness home practice was not as high as hoped, and less than the Bowen et al. (2009) study where 86% of participants reported continued mindfulness practice even after the intervention. Feedback forms showed an appreciation for the group facilitation, but scored lowest for intention to continue formal mindfulness practice. Considering that formal practice has been associated with long term outcomes (Bowen et al., 2014), it seems important to explore the contributing factors to engagement in home practice, which may include level of facilitator training and supervision, as this was a difference with the Bowen et al. (2014) study.

Study Limitations

A major limitation in this and other studies that wish to be naturalistic in nature, is that the more questionnaires that are completed by clients and the more changes that are made purely for research purposes, by for example, randomizing clients to groups, the less the study looks like an actual treatment setting in normal conditions and the less generalizable the results become. In this study, the researcher was limited in the number and size of questionnaires that could be used both by this factor, and because the agency giving permission to undertake research was clear about the limited time they were willing to have clients engage in additional paperwork. For this reason, two single-item Likert scales were used to assess client motivation and one single item scale was used each for psychological health and quality of life. The limited sensitivity of these measures may have missed finding significance where more robustly measured constructs might have succeeded.

A further major and unavoidable limitation of this research is the high number of uncontrolled variables. To begin, the version of MBRP being examined has been modified *and* it is being delivered by less well-trained and supervised staff. Therefore, for hypotheses that were not supported, aside from rejecting the hypothesis, it is not possible to speculate whether it is more likely to be the modification of the model *or* staff characteristics that may be responsible for the null hypothesis. The uncontrolled nature of this research design also makes causal conclusions impossible to draw. The MBRP-R12 course was offered as part of a much larger full-time day programme, with a wide range of interventions. There is no way to know if increases in mindfulness and psychological health are as a result of the mindfulness training or other aspects of the community recovery programme that participants were engaging with.

The typical high drop-out rate in this intensive structured day treatment programme prevented higher rates of end treatment data being compared to baseline. This meant that mediation analysis was unlikely to produce statistically significant results, so this was not examined. The limited size of the study also reduced the chance of finding statistical significance in the changes and correlations tested.

The limited time and resources available for this study prevented follow-up data from being collected to assess the potential for continued improvement that MBRP has been found to make after a 12-month period (Bowen et al., 2014).

Finally, data on actual substance misuse was not analysed in this study because it was not expected to provide meaningful findings due to the nature of the agency offering the intervention. Clients who breach their contract of abstinence while attending community recovery, either do not return, or are removed from the programme (if they report using substances) and rarely return for treatment, so would therefore not be available to complete end-of-treatment questionnaires. This meant that the main goal of the treatment programme could not be effectively assessed in this limited study and comparison with other studies that do look at this outcome was not possible.

Research Challenges

Numerous challenges are posed to those undertaking research that examines mechanisms and outcome in intensive substance misuse treatment settings. Firstly, the intensive setting makes it difficult to differentiate between the effects of different aspects of the treatment programme. Also, the client group presents a significant complication. Studies suggest that individuals seeking alcohol and drug misuse treatment are more likely to: have high severity substance dependence, mental health

problems, and acute health issues; be socially disadvantaged; have a low quality of life; and make use of social services (Lubman, et al., 2016). Additionally, dual diagnosis of mental health problems alongside substance misuse is often unreported: a study in the US found that while 11.7% of people participating in community-based day programs had a psychiatric diagnosis, clinical evaluation by psychologists suggested the true number to be more like 39% (Reiss, 1990). Dual-diagnosis has been estimated to be as high as 58% in substance misuse services in the UK (Schulte & Holland, 2008). This client profile, combined with underfunding and understaffing issues makes for a complex and often chaotic, therapeutic and research environment. Clients can be interpersonally challenging, unpredictable and fail to fulfil their attendance and other commitments, or arrive under the influence of substances. Most challenging, clients in this field can often suddenly cease all contact with services without explanation. These factors make gathering complete and reliable data sets for a significant number of participants difficult. Well-funded research studies such as those conducted by Bowen et al. (2009, 2014) can offer contingencies so that clients are paid for attendance and/or completing questionnaires, and this seems to have a positive effect on retention. However, doing this also inevitably has an effect on the intervention itself, making results less generalisable to non-research conditions that offer no such contingency for attendance.

Further difficulty in conducting research in a busy and chaotic substance misuse treatment setting is generated when relying on overworked agency staff to assist with administration and data collection. Staff may have a lack of training and supervision and the pressures of the work setting mean that protocols are sometimes not followed adequately. In this study, some questionnaires had data missing or were collected at a sub-optimal time period. Some copies of the PACS tool were at one point reproduced

with some questions missing, meaning data was missing, however this was only in 14% of T1 measures and no T2 measures, so it is hoped this had a minimal effect on the overall analysis of results. Another administration error resulted in every PANAS scale missing 8 out of the 20 items, meaning that a subset of the total measure had to be used and means calculated instead of totals. It was decided that the remaining 12 items were still more than the 10 used in the PANAS-SF (Thompson, 2007) which has been found to be a reliable measure, so this data was included in the analysis. TOPS forms which collected Quality of Life and Psychological Health scores were the most unreliably collected measure. These were filled in as part of a separate process to the main set of starting and ending questionnaires and confusion around procedures meant that many were not completed and some start forms were completed late and some end forms completed early. It was however decided that accepting late start forms and early completion forms was a more conservative constraint on finding significant effects of the intervention, so these were included in some analysis.

Failure to pilot the Mindfulness Meditation Record questionnaire left doubt as to the reliability of data collected using it. The client who offered qualitative feedback saying “I have practiced MBRP many times daily over the last 3 months”, answered the Mindfulness Meditation Record question quantifying formal mindfulness meditation practice times, saying they only practiced mindfulness formally 16 times in the last 12 weeks. This casts doubt on the validity of that particular mindfulness Meditation Record question. It is therefore possible that a number of clients read the question as if it was the last one week (as many questions ask) rather than the last 12 weeks. If this is the case, this would make data on the number of times people practiced mindfulness considerably flawed as people interpreting the question in different ways would make

these responses non-comparable and significantly skew correlation results and affect the significance of changes.

While there were significant challenges in conducting this study, all possible action was taken to obtain complete data-sets and significant lessons for future research in treatment settings such as this were identified. To account for some of the difficulties experienced in this study, future researchers working in this field are advised to maintain close contact with clients during the period of data gathering, ensuring contact details are held along with appropriate permissions to follow up on clients that fail to engage. Also, if it is essential to involve agency staff in administration or data gathering, they should be well trained and supervised and have regular checks to ensure all research procedures are followed. Unvalidated questionnaires generated specifically for the purposes of research should use explicit questions and be piloted to ensure questions are meaningful to participants and have sufficient construct validity.

Future Research

Overall, qualitative feedback was largely positive but with one participant clearly having a negative experience of MBRP. This client's unique take on the course would be valuable to explore in a case study which may unearth what it is about the individual and the course that makes the intervention difficult or less attractive for them and potentially others.

The current study attempted to evaluate a version of MBRP, modified to approximate a more typical form of mindfulness teaching based on the author's extensive experience of supervising addiction workers in UK settings. However, the diversity of interpretations of mindfulness approaches offered in numerous addiction

treatment settings makes it hard to know what is actually being delivered nationally. While some 'mindfulness' interventions may be congruent with evidence-based approaches, we do not know the extent to which evidence-based practice has proliferated. A comprehensive survey of current practice, exploring how mindfulness interventions in addiction treatment are being delivered in the UK is warranted and would allow a future study to observe versions of mindfulness teaching that more accurately reflect current practice.

Although results from this study are inconclusive regarding the effects of receiving MBRP on craving and relevant psychosocial indicators; the largely affirmative feedback from clients, combined with significant improvements in mindfulness and positive, if tentative associations found between mindfulness, craving and other measures, provides support for further avenues of research, including a full randomised controlled trial, informed by the findings of this research.

To better evaluate the constructs observed in this research, a future RCT would need to engage a larger sample and use more robust measures. Motivation could be assessed with a more comprehensive and sensitive questionnaire, such as the Treatment Motivation Questionnaire (TMQ; Ryan, Plant, & O'Malley, 1995). In addition to the complete version of the PANAS, psychological health could be assessed with greater reliability and sensitivity to sub-factors with a more comprehensive assessment such as the Mental Health Inventory (MHI; Veit, & Ware, 1983). Also, quality of life is a more complicated construct than can be meaningfully summarised in a single item measure, therefore, using a longer questionnaire, for example, the Multidimensional Index of Life Quality (MILQ; Avis, et al, 1996) would likely generate more meaningful data. Using questionnaires that allow constructs to be analysed in relation to underlying sub-factors highlighted in these measures would also help to understand more subtle

mechanisms and effects of interventions. The AAQ could be added to the FFMQ-SF to assess mindfulness more comprehensively. In addition, substance use frequency and levels could be measured. Longitudinal effects of the mindfulness intervention could be better understood by the collection of follow up data at periods of six, twelve and even 24 months post treatment if resources allow. However, randomisation and the inclusion of more testing all compromise the advantages of a more naturalistic study. This balance needs to be considered in identifying the aims of future research.

Research aimed at deepening understanding of the feasibility and acceptability of this approach is one avenue. To explore the extent to which the mindfulness aspect of the programme may have affected completion rates requires a controlled experiment which will help to assess the relative acceptability of mindfulness, as one argument (that this study does not add weight to) is that mindfulness may be more readily accepted than alternative more interpersonally challenging interventions and therefore mindfulness clients may complete treatment programmes in greater numbers. Another avenue of research is in comparing MBRP groups led by facilitators with different training and supervision levels, this could help illuminate the hypothesis that this makes a difference to home practice engagement. To better understand the effect of motivation on treatment adherence and completion, conducting a randomized study to compare court mandated with voluntary clients is not possible, so comparing non-randomised groups and examining outcome correlations with motivation in naturalistic studies such as this one would be a helpful future research avenue here. Finally, replicating the RCT previously conducted by Bowen et al. (2014), but using this model, could help to assess MBRP-R12 in a UK context against TAU and standard cognitive behavioural relapse prevention, thereby testing the relative efficacy of the model.

Clinical Implications

Findings from this study tentatively support the acceptability of MBRP-R12 in UK treatment settings. However, there is still a question as to whether findings from more comprehensive studies may be replicated in this modified version or when staff receive lower levels of training and supervision. Particular emphasis may be put on skilful encouragement for clients to engage in home practice assignments to make the most of their initial motivation. This may include pre-course Motivational Interviewing (M.I.; Miller, & Rollnick, 2012) techniques which have been shown to enhance engagement (Brown & Miller, 1993)

Conclusions

Positive qualitative client feedback along with acceptable attendance and completion rates tentatively support the feasibility of this intervention as part of substance misuse programmes in the UK. Relationships identified in this study between home practice and mindfulness and between baseline mindfulness and health promoting psychosocial indicators, promote the idea that engaging with MBRP-R12, even when led by less experienced and supervised teachers may have beneficial outcomes. Engaging in home practice assignments is likely to be an important part of the course and should receive adequate attention.

Although increases in mindfulness did not correlate with craving reduction in this study, the correlations at baseline (Table 2), in particular between mindfulness and affect and mindfulness and craving, offer tentative support for a more comprehensive study that explores these mechanisms and outcomes with greater participant numbers. A future study would be informed by lessons identified in this research and undertake a comprehensive path analysis of the model outlined in Figure 2.

References

- Andlin-Sobocki, P., Jönsson, B., Wittchen, H. U., & Olesen, J. (2005). Cost of disorders of the brain in Europe. *European Journal of Neurology*, *12*(1), 1-27.
- Avis, N. E., Smith, K. W., Hambleton, R. K., Feldman, H. A., Selwyn, A., & Jacobs, A. (1996). Development of the multidimensional index of life quality: a quality of life measure for cardiovascular disease. *Medical Care*, *34*(11), 1102-1120.
- Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S. & Williams, J. M. G. (2008). Construct validity of the five facet mindfulness questionnaire in meditating and nonmeditating samples. *Assessment*, *15*(3), 329-342.
- Baker, T. B., Morse, E., & Sherman, J. E. (1986). The motivation to use drugs: a psychobiological analysis of urges. In *Nebraska Symposium on Motivation*. University of Nebraska Press.
- Benishek, L. A., Dugosh, K. L., Kirby, K. C., Matejkowski, J., Clements, N. T., Seymour, B. L., & Festinger, D. S. (2014). Prize-based contingency management for the treatment of substance abusers: a meta-analysis. *Addiction*, *109*(9), 1426-1436.
- Blacker, M., Meleo-Meyer, F., Kabat-Zinn, J., & Santorelli, S., (2009) *Stress Reduction Clinic Mindfulness-Based Stress Reduction (MBSR) Curriculum Guide*, Center For Mindfulness In Medicine, Health Care, And Society. University of Massachusetts Medical School
- Bohlmeijer, E., Peter, M., Fledderus, M., Veehof, M., & Baer, R. (2011). Psychometric properties of the Five Facet Mindfulness Questionnaire in depressed adults and development of a short form. *Assessment*, *18*(3), 308-320.
- Bodhi, B. (2000). *Connected Discourses of the Buddha: A Translation of the Samyutta Nikaya*. Wisdom Publications.
- Bodhi, B (2011) What Does Mindfulness Really Mean? A Canonical Perspective, in Williams, J. M. G., & Kabat-Zinn, J. (2011). Mindfulness: diverse perspectives on its meaning, origins, and multiple applications at the intersection of science and dharma. *Contemporary Buddhism*, *12*(01), 1-18.
- Bowen, S., Chawla, N., Collins, S. E., Witkiewitz, K., Hsu, S., Grow, J. & Marlatt, A. (2009). Mindfulness-based relapse prevention for substance use disorders: A pilot efficacy trial. *Substance Abuse*, *30*(4), 295-305.

- Bowen, S., Chawla, N., & Marlatt, G. A. (2010). *Mindfulness-based relapse prevention for addictive behaviors: A clinician's guide*. Guilford Press.
- Bowen, S., & Kurz, A. S. (2012). Between-Session Practice and Therapeutic Alliance as Predictors of Mindfulness After Mindfulness-Based Relapse Prevention. *Journal of Clinical Psychology, 68*(3), 236-245.
- Bowen, S., Witkiewitz, K., Clifasefi, S. L., Grow, J., Chawla, N., Hsu, S. H., Carroll, H. A., Harrop, E., Collins, S. E., Lustyk, M. K. & Larimer, M.E. (2014). Relative Efficacy of Mindfulness-Based Relapse Prevention, Standard Relapse Prevention, and Treatment as Usual for Substance Use Disorders: A Randomized Clinical Trial. *Journal of the American Medical Association Psychiatry; 71*(5), 547-556.
- Brown, J. M., & Miller, W. R. (1993). Impact of motivational interviewing on participation and outcome in residential alcoholism treatment. *Psychology of Addictive Behaviors, 7*(4), 211.
- Brownell, K. D., Marlatt, G. A., Lichtenstein, E., & Wilson, G. T. (1986). Understanding and preventing relapse. *American Psychologist, 41*(7), 765.
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: mindfulness and its role in psychological well-being. *Journal of Personality & Social Psychology, 84*(4), 822.
- Chiesa, A., & Serretti, A. (2014). Are mindfulness-based interventions effective for substance use disorders? A systematic review of the evidence. *Substance use & misuse, 49*(5), 492-512.
- Department of Health (2007). *Drug Misuse and Dependence: UK Guidelines on Clinical Management*. London: Department of Health (England), the Scottish Government, Welsh Assembly Government and Northern Ireland Executive
- De Leon, G. D., Melnick, G., & Kressel, D. (1997). Motivation and readiness for therapeutic community treatment among cocaine and other drug abusers. *The American journal of drug and alcohol abuse, 23*(2), 169-189.
- Flannery, B. A., Volpicelli, J. R., & Pettinati, H. M. (1999). Psychometric properties of the Penn alcohol craving scale. *Alcoholism: Clinical and Experimental Research, 23*(8), 1289-1295.
- Giluk, T. L. (2009). Mindfulness, Big Five personality, and affect: A meta-analysis. *Personality and Individual Differences, 47*(8), 805-811.

- Gossop, M., Marsden, J., Stewart, D., & Treacy, S. (2001). Outcomes after methadone maintenance and methadone reduction treatments: two-year follow-up results from the National Treatment Outcome Research Study. *Drug & Alcohol Dependence*, 62(3), 255-264.
- Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of Psychosomatic Research*, 57(1), 35-43.
- Grow, J. C., Collins, S. E., Harrop, E. N., & Marlatt, G.A. (2015). Enactment of home practice following mindfulness-based relapse prevention and its association with substance-use outcomes. *Addictive Behaviors*, 40, 16-20.
- Hayes, S. C., Strosahl, K., Wilson, K. G., & Bissett, R. T. (2004). Measuring experiential avoidance: A preliminary test of a working model. *The psychological record*, 54(4), 553.
- Hall, M. N., Amodeo, M., Shaffer, H. J., & Vander Bilt, J. (2000). Social workers employed in substance abuse treatment agencies: A training needs assessment. *Social work*, 45(2), 141-155.
- Harrison, L. D., & Scarpitti, F. R. (2002). Introduction: Progress and issues in drug treatment courts. *Substance use & misuse*, 37(12-13), 1441-1467.
- Headey, B., Kelley, J., & Wearing, A. (1993). Dimensions of mental health: life satisfaction, positive affect, anxiety and depression. *Social Indicators Research*, 29(1), 63-82.
- Helbig, S., & Fehm, L. (2004). Problems with homework in CBT: Rare exception or rather frequent?. *Behavioural and Cognitive Psychotherapy*, 32(03), 291-301.
- Henggeler, S. W., Schoenwald, S. K., Liao, J. G., Letourneau, E. J., & Edwards, D. L. (2002). Transporting efficacious treatments to field settings: The link between supervisory practices and therapist fidelity in MST programs. *Journal of Clinical Child and Adolescent Psychology*, 31(2), 155-167.
- HM Government. (2012). *The Government's Alcohol Strategy*. HM Government, UK. Retrieved from <https://www.gov.uk/government/publications/alcohol-strategy>
- Hodgins, D. C., Currie, S. R., el-Guebaly, N., & Diskin, K. M. (2007). Does providing extended relapse prevention bibliotherapy to problem gamblers improve outcome?. *Journal of Gambling Studies*, 23(1), 41-54.

- Jain, S., Shapiro, S. L., Swanick, S., Roesch, S. C., Mills, P. J., Bell, I., & Schwartz, G. E. (2007). A randomized controlled trial of mindfulness meditation versus relaxation training: effects on distress, positive states of mind, rumination, and distraction. *Annals of Behavioral Medicine, 33*(1), 11-21.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. Hyperion.
- Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., Chapleau, M-A., Paquin, K. & Hofmann, S. G. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review, 33*(6), 763-771.
- Lubman, D. I., Garfield, J. B., Manning, V., Berends, L., Best, D., Mugavin, J. M., & Room, R. (2016). Characteristics of individuals presenting to treatment for primary alcohol problems versus other drug problems in the Australian patient pathways study. *BMC psychiatry, 16*(1), 250.
- Marlatt, G. A., & Donovan, D. M. (Eds.). (2005). *Relapse prevention: Maintenance strategies in the treatment of addictive behaviors*. Guilford Press.
- Marsden, J., Farrell, M., Bradbury, C., Dale-Perera, A., Eastwood, B., Roxburgh, M., & Taylor, S. (2008). Development of the treatment outcomes profile. *Addiction, 103*(9), 1450-1460.
- Maslin, H. L. Graham, M. C., Copello, A., Birchwood, M., Georgiou, G., McGovern, D., Mueser, K., Orford, J. (2001). Combined severe mental health and substance use problems: What are the training and support needs of staff working with this client group? *Journal of Mental Health, 10*(2), 131-140.
- McCown, D., Reibel, D., & Micozzi, M. S. (2011). *Teaching Mindfulness: A Practical Guide for Clinicians and Educators* (1st ed.). London: Springer.
- McLellan, A. T., Lewis, D. C., O'Brien, C. P., & Kleber, H. D. (2000). Drug dependence, a chronic medical illness: Implications for treatment, insurance, and outcomes evaluation. *Journal of the American Medical Association, 284*, 1689-1695.
- McMurrin, M., & Theodosi, E. (2007). Is treatment non-completion associated with increased reconviction over no treatment?. *Psychology, Crime & Law, 13*(4), 333-343.
- Miller, W. R., & Rollnick, S. (2012). *Motivational Interviewing: Helping people change*. Guilford press.

- National Audit Office (2010). *Tackling Problem Drug Use*. National Audit Office, UK. Retrieved: February 20, 2016, from <http://www.nao.org.uk/druguse10>
- National Drug Intelligence Center. (2011). *The economic impact of illicit drug use on American Society*. Retrieved: February 20, 2016, from <http://www.justice.gov/archive/ndic/pubs44/44731/44731p.pdf>
- NICE (2007) *Drug Misuse: Psychosocial Interventions. NICE clinical guideline 51*. London: National Institute for Health and Clinical Excellence.
- NICE. (2009). *CG90 Depression in adults (update)*. National Institute for Health and Clinical Excellence. Retrieved: February 20, 2016, from <http://publications.nice.org.uk/depression-in-adults-cg90>
- Reiss, S. (1990). Prevalence of dual diagnosis in community-based day programs in the Chicago metropolitan area. *American Journal on Mental Retardation*, 94(6), 578-585
- Ryan, R. M., Plant, R. W., & O'Malley, S. (1995). Initial motivations for alcohol treatment: Relations with patient characteristics, treatment involvement, and dropout. *Addictive Behaviors*, 20(3), 279-297.
- Schroevers, M. J., & Brandsma, R. (2010). Is learning mindfulness associated with improved affect after mindfulness-based cognitive therapy?. *British Journal of Psychology*, 101(1), 95-107.
- Schulte, S., & Holland, M. (2008). Dual diagnosis in Manchester, UK: practitioners' estimates of prevalence rates in mental health and substance misuse services. *Mental Health and Substance Use: Dual Diagnosis*, 1(2), 118-124.
- Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-Based Cognitive Therapy for Depression: A New Approach to Preventing Relapse* (1st ed.). London: Guilford Press.
- Simpson, D. D., & Joe, G. W. (1993). Motivation as a predictor of early dropout from drug abuse treatment. *Psychotherapy: Theory, Research, Practice, Training*, 30(2), 357.
- Stahler, G. J., Mennis, J., & DuCette, J. P. (2016). Residential and outpatient treatment completion for substance use disorders in the US: Moderation analysis by demographics and drug of choice. *Addictive Behaviors*, 58, 129-135.

- Teasdale, J., Segal, Z., Ridgeway, V., & Soulsby, J. (2000). Prevention of Relapse/Recurrence in Major Depression by Mindfulness-Based Cognitive Therapy. *Journal of Consulting and Clinical Psychology*, 68(4), 615–623.
- Thompson, E. R. (2007). Development and validation of an internationally reliable short-form of the positive and negative affect schedule (PANAS). *Journal of Cross-Cultural Psychology*, 38(2), 227-242.
- UNODC (2012). *World Drug Report, 2012*. United Nation Office on Drugs and Crime.
- Veit, C. T., & Ware, J. E. (1983). The structure of psychological distress and well-being in general populations. *Journal of consulting and clinical psychology*, 51(5), 730.
- Wallace, A. E., & Weeks, W. B. (2004). Substance abuse intensive outpatient treatment: Does program graduation matter?. *Journal of Substance Abuse Treatment*, 27(1), 27-30.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063.
- Watson, D., & Clark, L. A. (1999). *The PANAS-X: Manual for the positive and negative affect schedule-expanded form*. Department of Psychological & Brain Sciences Publications, The University of Iowa
- West, R., (2013). *European Monitoring Centre of Drugs and Drug Addiction (EMCDDA), Insights. Models of Addiction*. EMCDDA. Luxembourg: Publications Office of the European Union, Lisbon, Portugal.
- WHO (2014) *Global status report on alcohol and health, 2014*. World Health Organization.
- Wickizer, T., Maynard, C., Atherly, A., Frederick, M., Koepsell, T., Krupski, A., & Stark, K. (1994). Completion rates of clients discharged from drug and alcohol treatment programs in Washington State. *American Journal of Public Health*, 84(2), 215-221.
- Witkiewitz, K., & Bowen, S. (2010). Depression, craving, and substance use following a randomized trial of mindfulness-based relapse prevention. *Journal of Consulting & Clinical Psychology*, 78(3), 362.

Witkiewitz, K., Bowen, S., Douglas, H., & Hsu, S. H. (2013). Mindfulness-based relapse prevention for substance craving. *Addictive Behaviors*, 38(2), 1563-1571.

Witkiewitz, K., Greenfield, B. L., & Bowen, S. (2013). Mindfulness-based relapse prevention with racial and ethnic minority women. *Addictive Behaviors*, 38(12), 2821-2824.

Appendices

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