Evaluating anxiety, depression and dream imagery in men recovering from substance abuse

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Summary. Addiction can lead to a plethora of health, social and economical problems. Substances are used for mood regulation, and therefore, waking day mood is extremely important during recovery of alcohol and drug addiction. The current study examined the effects of meditation on anxiety and depression levels. All participants were male, and currently in treatment programs or early stages of recovery from alcohol and drug addiction. Participants were tested for anxiety and depression and were asked to provide a recent dream, prior and post to participating in the intervention. Dreams were scored using Hall and Van de Castle guidelines for scoring imagery. Results are consistent with previous research in that anxiety and depression levels changed over the course of the meditation period. Implications for future research are discussed as well as applications of meditation in clinical and applied practice.

Keywords: Mood fluctuation; dream imagery; addiction

1. Introduction

Alcohol and drug addiction is one of today's problematic illnesses, which can lead not only to health problems, but also to social, economic, and occupational damage (DeCicco & Higgins, 2009; Haydon, Rehm, Fischer, Monga & Adlaf, 2005; Tuten, DeFulio, Jones & Stitzer, 2011). Experiencing the physiological characteristics of addiction, rather than just dependence, leads to an increase in suffering both physically and mentally. As such, waking day mood also becomes very important during recovery of alcohol and drug addiction, as the substances work as mood regulators (DeCicco & Higgins, 2009).

Addiction includes an increase in tolerance and withdrawal and a loss of control with a compulsion to take a drug on a periodic or continuous basis (Heather, 1998, p3). Alcoholism can be defined as repeated alcohol-dependent impairment which includes interpersonal, cognitive, legal, occupational, and health problems, due to repeated drinking (Schuckit, 1994; DeCicco & Higgins, 2009).

Integration back into the community is vital for continuous sobriety and decreased recidivism in regards to addiction and treatment (Lesage et al., 2000). Early recovery is extremely important due to consequences of active use, but those in early recovery are at an extremely high risk for relapse (Shumway et al., 2013). Treatment has been seen to positively affect self-efficacy, psychosocial functioning, network/social support, craving, and quality of life (Tiffany et al., 2011), and as such improves daily life.

1.1. Treatment

To begin discussing treatment for addiction is to begin discussing treatment for mental health. There have been an excess of treatments for mental health disorders over time, including psychiatric disorders as a result of chronic addiction. There are many treatments currently used for addiction, dependent on the substance and severity including abstinence based programs such as residential treatment or recovery homes. Housing has been noted as one of the most important factors for those recovering from a SUD (Tuten et al., 2011). "Recovery houses are operated typically by individuals in recovery and require the residents to pay rent, remain abstinent, and obey house policies" (Tuten et al., 2011, p. 973). Another abstinence-based resource is Alcoholics Anonymous (A.A.), a support group which utilizes a 12-step program to teach alcoholics how to live without alcohol by addressing mood changes that are consequently due to abstaining from alcohol (DeCicco & Higgins, 2009). Members of A.A. share their experiences with one another and offer services or sponsorship to any alcoholic coming into the program. There have been many studies on the effectiveness of 12-step programs with much success (Chi, Campbell, Sterling & Weisner, 2011), specifically increasing attendance and active involvement in 12-step programs following treatment for SUD is associated with better substance outcomes (Kelly et al., 2012). Treating the chemical dependence is only part of a full recovery, as mood fluctuations and disorders appear to run rampant within this population. There are also client-centered therapies such as Cognitive Behavioural Therapy or harm reduction programs such as the Methadone program (Donovan et al., 2011). Regardless, treatment of the substance dependence is only part of a full recovery, there are social, emotional and biological components that require treatment as well.

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1.2. Comorbidity

There is a plethora of research on drug use disorders comorbidity with mood disorders such as anxiety, depression and personality disorders (Fenton, 2011). According to Delmonte (1985), shame and guilt are two emotions regularly experienced as psychological symptoms associated with anxiety. A common co-occurring mood disorder experienced when suffering from drug and/or alcohol addiction is depression (Fenton et al., 2011). Depression is one of the most pervasive problems in mental health but it is still reported that at least one-third of primary care patients escape early detection (Hill, 2003). According to Afifi, Enns, Cox and Martens (2005), depression is twice as prevalent in Canadian adolescence in comparison to childhood and is one of the leading causes of disability due to functional impairments and development of other mental disorders. Further, research has found a positive association between depression and alcohol abuse (Afifi et al., 2005; Paterson & Markou, 2007). Depression can be very dangerous (Paterson & Markou, 2007), combined with the dangerous effects of drug abuse, it can lead to fatality. One explanation of this comorbidity is drug dependence may be maintained through positive reinforcement of drug use and negative effects of withdrawal (Paterson & Marjou, 2007). The authors explain how the depressive symptoms that are associated with drug withdrawal can lead to continued use and dependence of the substance as an avoidance mechanism. After initial physical acute withdrawal symptoms, those in recovery may experience Post Acute Withdrawal Syndrome (PAWS) (Post Acute Withdrawal, 2014). PAWS often involves emotional and psychological withdrawal symptoms, including increased anxiety, depression, and nightmares (Post Acute Withdrawal, 2014). Thus, treating the depression may in fact help treat the addiction as it may lessen the withdrawal symptoms. Although there are a variety of treatment methods, both behavioural and pharmaceutical, treatment of mood disorders is necessary regardless as they tend to worsen without treatment (Howard, 2003). One example of a behavioural intervention used to decrease anxiety and depression is meditation.

1.3. Meditation

Meditation has developed into many different forms, such as self-guided (natural stress relief) or therapist guided (mindfulness based cognitive therapy), and can be utilized in a variety of ways (Coppola & Spector, 2009; Schreiner & Malcolm, 2008). Natural stress relief (NSR) meditation can be practiced for 15 minutes twice a day and reduces stress and anxiety by inducing a physiological state of deep rest (Coppola & Spector, 2009). Practicing NSR meditation continuously has a positive correlation with self-actualization, which Coppola and Spector (2009) state is a natural consequence of the elimination of stress and anxiety through deep rest, while remaining mentally alert. One of the most common uses for meditation used by therapists and clinicians is to help reduce the symptoms of stress and its related symptoms such as anxiety and depression and has successfully benefitted patients with mental illness (Alterman et al., 2004). A mindfulness technique attempts to rest all attention including sensory and mental contents and has been used to treat substance use disorders by promoting acceptance of thoughts and feelings, such as cravings and using these skills to develop coping mechanisms (Alterman et al., 2004; Witkiewitz, Marlatt & Walker, 2005).

1.4. Sleep Mentation

One dominant and current theory of dreams is the Continuity Hypothesis, suggesting that waking day life and experiences are continued into dream imagery (Hall & Nordby, 1972; King & DeCicco, 2007). Heaton, Hill, Hess, Leotta and Hoffman (1998) explain, "….dreams reflect unresolved emotional concerns and function to integrate or assimilate these concerns into a person's existing memory system" (p. 147). This allows for meaning to be derived in regard to waking day, by connecting emotional past and present situations (Heaton et al., 1998). This has been reflected in people suffering with an addiction to alcohol, as DeCicco and Higgins (2009) found during active drinking, dreams appear to be unpleasant and contain drinking, observing drinking, talking about drinking, craving, and a repressed desire to drink. King and DeCicco (2007) reinforced these findings suggesting that people who score lower in emotional wellbeing and higher in depression experience more sadness, anger, aggression, violent, and negative dreams. Those who suffer from addiction have lower emotional wellbeing and may also suffer from depression, suggesting their dreams may include this negative affect as well. Interestingly, Looney (1972) discussed a study in which 37 heroin addicts' dreams were analyzed and none of the dreams included a successful high. Such that, the participants reported seeing, touching, attempting to use but the euphoric feeling of a successful hit was never recalled. This suggests different substances may be associated with different dream content.

Literature also demonstrates the physiological connection between dreaming and addictions, such that exposure to drugs upregulates dopaminergic neurotransmission in the ventral tegmentum (Johnson, 2001). Johnson (2001) notes that this "…upregulation both stimulates increased dreaming and introduces as new drive, whose object is addictive drugs." (p. 17). Johnson (2001) explains that the ventral tegmental pathway drives animals to seek food, water, and sex, and also produces cravings for drug and drug-associated stimuli due to episodic drug exposure. The author also notes the same ventral tegmental pathway is activated during dreaming, specifically during Rapid Eye Movement (REM) sleep. This link may be why patients in detox and treatment programs describe drug dreams (Looney, 1972), such that they are craving the drugs because of this up regulation, as this pathway both increases dreaming and cravings. Symptoms of PAWS may also have an impact on substance abusers dream content, including disturbed sleep and dreams. This finding suggests that drug using dreams can be a very important tool in recovery for both the patient and therapist. The current study will examine dream content in relation to early recovery in male substance abusers.

1.5. Purpose

Thus, the purpose of the present study was to examine how a form of meditation used as an intervention effects waking day anxiety and depression levels for those in early recovery from drug and alcohol addiction. Changes in dream imagery were examined as this is known to be an indicator of waking day mood (DeCicco, 2007a; Jones & DeCicco, 2009; Miller & DeCicco, 2012).

1.6. Hypotheses

▪ Hypothesis 1 states that waking day depression and anxiety will be reflected in dream imagery, as was found in previous studies (Jones & DeCicco, 2009; Zanasi et al., 2010). Anxiety will be shown through multiple scene changes, and depression through negative affect and mood imagery (Miller & DeCicco, 2012; 2013; Clarke, De-Cicco & Navara, 2010).

▪ Hypothesis 2 states that measures of waking day anxiety and depression will decrease after two weeks of Meditation (Coppola & Spector, 2009).

▪ Hypothesis 3, an exploratory analysis, hypothesizes that dream imagery will significantly predict lower levels of anxiety and depression in hierarchical regression models.

2.   Method

2.1. Participants

The study participants included 18 substance-dependent men who were in a treatment at Paul J Sullivan Centre through Renascent, or residing in Park Road South Community Home, a recovery facility for men in early recovery from drug and alcohol addiction. All participants partook in the intervention program, but voluntarily participated in the study, and completed full informed consent procedures. Control data (n = 5) was collected with clients who participated in regular programing at both the treatment facility and sober house for a period of two weeks. Followed by a two-week cycle of clients who participated in the intervention (n = 13) in addition to their regular programming. Data was collected through this cycle for three months to try and account for recidivism rates and client turn over in each program. The mean age of the participants was 41 (SD = 13.4), 50 percent indicated alcohol as their drug of choice and almost 45 percent had been using for over 20 years. Please see Table 1 for demographics.

2.2. Measures

2.3. Mood Measurements

The Beck Anxiety Inventory (BAI) (Beck, Epstein, Brown & Steer, 1988) is a 21-item self-report questionnaire that was used to measure the participants' pre and post anxiety levels. The BAI measures the severity of an individual's anxiety. The BAI has been found to be both valid and reliable in previous research (Steer et al., 1997). To measure the participant's pre and post depression levels, The Beck Depression Inventory (BDI) was used, as it measures symptom severity (Beck, Ward & Mendelson, 1961). The BDI has been found to be both valid and reliable (Beck, Ward & Mendelson, 1961).

2.3.1   Dream Measure

The Projective method of dream interpretation involves group projections on sleep mentation and has been found to be both valid and reliable (DeCicco, 2007b).

2.3.2   Content Categories

All the participants were asked to hand in one dream that they had experienced within the last week before meditation (pre-condition), and one dream from the current week after meditation (post-condition). All dreams were content analyzed using Content Analysis, designed by Hall and Van de Castle (1966). Content Analysis uses a scoring system of dream imagery, chosen through predefined content categories. Categories were chosen in regards to frequency within the dreams as well as previous research. For example, anxious imagery has been correlated with animals and scene changes, and depressive imagery has been correlated with dark colours and negative affect (Jones & DeCicco, 2009; Zanasi et al., 2010). The categories chosen for this study were: Drugs (alcohol or drugs), Using, Searching and Selling substances; Using Fail, the inability to use; Friendly, Sexual and Aggressive Social Interactions; Family Members (current/ex partners, children and parents); Objects (paraphernalia); Fear Group (Afraid, Scared, Distress), Nervous Group (Nervous, Jittery); Hostile Group (Hostile, Irritated), Upset and Guilt Group (Guilty, Ashamed) emotions; Anxious Emotions; Animals; Dark Colours; Violence; Failure; Familiar and Unfamiliar Characters in association with substance use; Buildings associated with substance use (e.g. LCBO, Bar, Methadone Clinic); Male and Female Characters.

2.4. Procedure

The researcher met with the participants everyday (or as appropriate) for the duration of the study. During the first meeting the participants read and signed a consent form and information on demographics was collected. The participants were asked to fill out their initial package, including a recording of their most recent dream, as well as the BAI and BDI measures. Participants then filled out a second package after a period of two weeks, with no intervention in place to act as a control, or after a period of two weeks meditating once a day for 15 minutes. Mood and dream content was analyzed. Statistical analyses were then performed to examine any differences between the groups of participants for mood fluctuation as well as dream content and predictability.

2.5. Analyses

SPSS Statistics 21.0 was used for all statistical analyses.

3.   Results

3.1. Dream Imagery

In order to test hypothesis one, the Hall and Van de Castle system of content analyses was used to score and analyze anxiety and depression imagery. Correlations were then conducted to observe whether waking day anxiety and depression measures are linked with specific dream imagery. A correlation was conducted to test whether there was a significant relationship between BAI scores and the frequency of Scene Changes, Anxious Emotion and Animals. Although no significant correlations were found with typical anxious imagery, there was a significant correlation between pre-treatment BAI scores and the frequency of Objects (paraphernalia) ($r = .59$, $p < .05$), and Upset emotions ($r = .66$, $p < .01$) in dream imagery. Indicating that before intervention implementation, as participants' anxiety scores increased, the frequency of Paraphernalia and Upset dream imagery appear to increase as well. Contrary to predictions, there were no significant correlations between BAI after intervention implementation and specific dream imagery (See Table 2).

A correlation was also conducted between BDI scores and negative dream imagery, including Dark, and Failure with no significant correlations found. However there were significant correlations between BDI scores and Using (r = -.47, p < .05), Sexual Social Interactions (r = .47, p < .05), and Confusing (r = .63, p < .01) dream imagery before intervention implementation. This suggests that as depression scores increased, Using dream imagery decreased, but

Table 1. Baseline demographics of participants.

Measure		Control n=5 % (n)	Experimental n=13 % (n)
Age		M = 37.8, SD = 13.6	M = 42.2, SD = 13.6
Marital Status	Single	40 (2)	53.8 (7)
	Married	20 (1)	23.1 (3)
	Common Law	40 (2)	23.1 (3)
LOE	High School	60 (3)	53.8 (7)
	College/University	40 (2)	30.8 (4)
	Trades	0	7.7 (1)
	Other	0	7.7 (1)
Drug of Choice	Alcohol	60 (3)	46.2 (6)
	Crack/Cocaine	20 (1)	15.4 (2)
	Opiates/Opioid	20 (1)	15.4 (2)
	Poly		23.1 (3)
Duration of Use	1-5 Year	20 (1)	15.4 (2)
	5-10 Years	20 (1)	
	>10 Years	20 (1)	30.8 (4)
	>20	20 (1)	53.9 (7)
Duration of Recovery (weeks)	<1	20 (1)	30.8 (4)
	1-5	20 (1)	30.8 (4)
	5-10	20 (1)	15.4 (2)
	10-20	20 (1)	15.4 (2)
	>20	20 (1)	7.7 (1)
Psychiatric Disorder	Yes	60 (3)	46.2 (6)
	No	40 (2)	53.8 (7)
Medication	Yes	20 (1)	30.8 (4)
	No	80 (4)	69.2 (9)
Meditation	Yes	40 (2)	30.8 (4)
	No	60 (3)	69.2 (9)
Meditation Freq	Rarely	0	7.7 (1)
	Sometimes	20 (1)	15.4 (2)
	Often	0	7.7 (1)
	Very Often	20 (1)	
Spirituality	Yes	80 (4)	23.1 (3)
	No	20 (1)	76.9 (10)

Note. LOE = Level of Education; Drug of Choice = Participants drug of choice; Duration of Use = Number of years participants have been using drugs and/or alcohol; Recovery (w) = Number of weeks participants have been sober; Psych Disorder = Clinically diagnosed psychiatric disorder; Medication = Whether or not participants are currently taking medication for their psychiatric disorder; Meditation = Meditation history; Frequency= Frequency of meditation experience; Spirituality = Do you consider yourself spiritual.

Table 2. Correlation BAI and Dream Imagery .

	BAI-Pre	ScChang	AnxEmot	Animal	Object	Upset
BAI-PRE	1.00	-.22	-.05	-.22	.59*	.66**

Note. BAI = Beck Anxiety Inventory; ScChang = Scene Change in imagery; AnxEmot = Anxious Emotion imagery; Animal = Animal imagery; Object = Paraphernalia imagery; Upset = Upset imagery. *p < .05 **p < .01

both Sexual social interactions and Confusing imagery increased before any treatment intervention. Contrary to prediction, there were no significant correlations between BDI post interventions and specific dream imagery (See Table 3).

3.2. Mood Levels pre- and post-intervention

Hypothesis two was tested using t tests to compare anxiety and depression levels pre and post meditation interventions. There was a significant difference between anxiety levels before (M = 20.25, SD = 13.15) and after (M = 15.88, SD = 12.26) two weeks of meditation intervention, t(15) = 2.6, p < .05. Suggesting that anxiety levels significantly decreased after the implementation of meditation from moderate to mild scoring of anxiety. The paired sample t-test also illustrated a significant difference between depression levels before meditation (M = 18.40, SD = 8.65) indicating borderline clinical depression and post (M = 11.63, SD = 5.98) meditation intervention, t(15) = 2.89, p < .05, indicating a mild mood disturbance (See Table 4).

3.3. Exploratory Analysis

Finally, hypothesis three included exploratory analyses, inquiring whether dream imagery would significantly predict lower levels of anxiety and depression in hierarchical regression models. A linear regression was conducted to determine if dream imagery was predictive of mood. After conducting a correlation between BAI scores and dream imagery, both Object and Upset were entered into a stepwise regression. At step one Upset was entered into the regression equation and was significantly related to moderate to high anxiety, F(1, 5) = 9.95, p < .05. The multiple correlation coefficient (R = .82), indicated that approximately 66.5 percent of the variance of BAI scores could be accounted for by Upset dream imagery, before intervention was implemented.

Another regression was performed to see whether or not specific dream imagery was predictive of depression levels. Stepwise regression indicated that Confusion within dream imagery is predictive of moderate to extreme depression, F(1, 6) = 32.26, p < .001. The multiple correlation coefficient (R = 0.92) indicated that approximately 84.3 percent of the variance of BDI scores could be accounted for by Confusion within dream imagery before an intervention was implemented.

4. Discussion

4.1. Dream Imagery

Contrary to past research, which suggests those who are suffering from moderate to high anxiety experience scene changes, the participants in this study did not illustrate a correlation between scene changes and their anxiety levels (DeCicco & Higgins, 2009). One possible explanation is that isolation is very common and problematic for addicts (Wolffgramm & Heyne, 1995). People suffering from addiction tend to isolate themselves from other people and do not partake in layperson daily routines, especially when using for long periods of time (Wolffgramm & Heyne, 1995). Isolation prevention is actually built into treatment programs, for example most treatment facilities do not allow the clients to stay in single rooms or access technology (computers, cell phones etc.) to control for this isolation. Although research has found a link between scene changes and anxiety, this is for a population who may not isolate as much as addicts e.g. students. Given the demographics of this sample included male addicts who were post detox, who had been through treatment programs and/or were living in a sober house, very early in their recovery and half of them had a duel diagnosis, they may have been the most severely affected by their addiction. These environmental and biological factors are different from the general population. Therefore, if their waking day patterns were very different in comparison to other populations it is not as unexpected that they may experience different dream patterns.

There is however a positive relationship between anxiety scores and Object-Paraphernalia and Upset dream imagery. This indicates that before treatment, having frequent Paraphernalia and Upset imagery within sleep mentation may indicate moderate anxiety. Both the client and clinician can use this to measure mood fluctuations and seek or provide treatment as necessary. A participant in the control group experienced a dream which included Paraphernalia and Using, for example:

Had a dream of Fentynol and oxys and crack it felt as real that it was true woke up checked my pocket to see if it was there. I was using by myself smoking these drugs off of tin foil and pipe also dreamt about going to jail of something I've done in the past (Participant 5-DIA03G).

Table 3. Correlation BDI and Dream Imagery.

	BDI-Pre	DarkCol	Failure	Using	Sexual	Confusion
BDI-Pre	1.00	.07	-.15	-.47*	.47*	.63**

Note. BBDI-Pre = Beck Depression Inventory pre intervention; DarkCol = Dark Colours imagery; Failure = Failure Imagery; Using = Using drug and/or alcohol; Sexual = Sexual Interaction imagery; Confusion = Confusing imagery. *p < .05 **p < .01

Table 4. Mood Differences Pre & Post Meditation.

Variable	Pre Intervention		Post Meditation		
	M	SD	M	SD	t(15)
BAI	20.25	13.15	15.88	12.26	2.6*
BDI	18.4	8.65	11.63	5.98	2.89*

Note. BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory Pr Intervention = Pre Condition; Post Meditation = Post Condition; M = Mean; SD = Standard Deviation. *p < .05

This second example was a dream experienced by a participant in the intervention group that included Paraphernalia and Negative Affect:

I wake up in my dream to find myself watching my wife using my drug (heroin). The sense of anger and the smell of vinegar fill my mind and nose. She continues in the same manner as me, heating a spoon and the smell of the lighter fill the air. I am helpless she can't hear me nor can I touch her to stop her. She starts to lie, steal and neglect our children again I yell and I scream but no reaction (Participant 15-LIN07N).

4.2. Mood Levels pre and post intervention

As predicted, anxiety and depression scores did in fact decrease after two weeks of meditation with mean BAI scores falling from borderline clinical depression to mild mood disturbance. This indicates that meditation in adjunct to regular programming may help alleviate anxious emotions and symptoms. Clients claimed they felt much better and the clinical supervisor saw improved behaviour. These claims are supported in the results, such that both anxiety and depression did in fact decrease significantly after 2 weeks of meditation. In addition to the statistical analysis, participants were given the availability to leave comments for the researcher, as testimonials of the program. When asked whether or not they felt the program had benefited them in their treatment, one of the participants wrote:

…I am an addict of cocaine and opiates (10 yrs coke, 5 years opiates) when detoxed my emotions were (alive) and noisy in my head. This form of meditation had such an impact that it helped me 'quiet' some of this noise and anxiety became more manageable each day. And could use myself when needed. I find this was a key piece of my treatment; and will continue to use…(Ryan K, 2014)

This illustrates the perceived benefit of meditation that one participant felt, he believed the intervention positively impacted his recovery. Again, illustrating the effectiveness of only two weeks of meditation.

4.3. Exploratory Analysis

Upset dream imagery appears to be predictive of moderate to high anxiety before intervention is implemented. This indicates that the recovering addicts are not regulating their emotions, eliciting high waking day anxiety. This has strong clinical implications because emotional regulation is the key to addiction recovery.

Confusion within dream imagery appears to predict moderate to severe depression in those who are post detox with little to no treatment. The strong clinical implication is that if clients have Confusion in their dream imagery, this may be a red flag indicating clinical depression levels and therefore, treatment may be necessary.

4.4. Important Implications

Participants reported feeling emotionally regulated after 2 weeks of meditation. This was supported in the results such that, after 2 weeks of meditation participants were less anxious and depressed. Meditation appears to be more powerful than originally predicted. Here is another example of a participant testimonial in regard to the effect meditation had on him "I came to the session with excruciating itchiness in the lower back. I was squirming on the chair itching constantly before the session. As the meditation session progressed I concentrated on my back and the itchiness completely subsided." (Andrew G, 2014).

Another important clinical implication was the predictive value of dream imagery pre-treatment. Before any treatment was implemented, specific dream imagery predicted clinical levels of anxiety and depression, which could be used in a clinical environment.

4.5. Limitations

One important limitation to working with this population was a very high attrition rate, resulting in a low n. The original sample was 37 men in residential treatment programing, 19 relapsed leaving a total of 18, five were left in the control group and 13 completed the full intervention. This high attrition is a known problem in addiction recovery (Witkiewitz et al., 2005), which emphasizes the importance of this research.

The low sample size could also be due to the sample demographics. Research has found that withdrawal may increase nocturnal awakenings, and therefore decrease dream recall (Schredl, 1999). This sample is very early in recovery and therefore, the short duration post detox may interfere with dream recall. With that, perhaps the duration of recovery and dream recall have a positive relationship. It would be interesting to see if the frequency of words increases for sleep mentation recall over time such that, the longer one is in recovery the easier it is for them to recall their dream. This low n also made it difficult to compare the intervention group and control group and increases the possibility of type 2 error.

A third limitation of this study was that all participants are post detox and in either a residential treatment program or

post treatment facility in which they are tested with urine and saliva randomly. Given the detection period for alcohol is about 12 hours and two to four days for other drugs (Donovan et al., 2011) and the relapse rate is high within this population, participants possibility could have still been using substances during data collection period. Therefore, this could have affected both dream recall and mood regulation. Furthermore, as stated in Armitage, Rochlen, Fitch, Trivedi and Rush (1995), antidepressant medications may influence the amount of REM sleep experienced and therefore may influence dream recall. With that, 70 percent of participants were taking prescribed medication and as such this too may have influenced dream content and/or recall.

4.6. Future Directions

Within this study, anxiety and depression were measured to represent mood fluctuations as they are one of the biggest indicators. With that, other mood measures should be used in future studies. As the population used in this study was high-risk, procedure and methodologies may become complicated and therefore, repeated studies are always recommended. Now that it is illustrated that participants' mood is in fact being regulated, future studies should include follow up procedures to measure sobriety long term. Proof of the benefits of these interventions can be seen in physical appearance, their mood measures, and their sobriety.

It would also be interesting to examine outcomes beyond two weeks of meditation. Is there a ceiling effect or does mood continue to improve? Tracking the frequency of words in dream recall after two weeks would indicate if sleep mentation recall becomes easier and more frequent the longer one is in recovery. The current study highlights the benefits of conducting a longitudinal study to allow for a more complete look at meditation effects.

4.7. Conclusion

It is important to note the complexity of the sample used in this study. Not only were the participants males suffering from severe alcohol and or drug addiction but also as the research suggests, this usually includes comorbidity of mental health problem, lower SES, criminal behaviour and, tragic circumstances (Fenton et al., 2011; Merikangas, 1998). Most of the participants within this study had discussed their criminal background, or court ordered treatment plan with the researcher. One of the participants had come from the Special Handling Unit co-located at Sainte-Anne-Des Plaines, Quebec, Canada's highest security prison. Another participant was removed from treatment and placed within a mental health hospital due to on-going mental health illness. These occurrences suggest the sample of participants were extremely high risk for high recidivism and relapse rate. Substance abuse is problematic worldwide (Witkiewitz et al., 2005), emphasizing the importance of this research and treatment of mood regulation is imperative. Lesage et al. (2000) describes the importance of integration back into the community post treatment, as vital for continuous sobriety and decreased recidivism. Decreased levels of anxiety and depression may help with this transition and using mindfulness techniques can be utilized outside of treatment as well. In conclusion, it appears that these participants may have been using drugs and alcohol to regulate their negative mood, and meditation appeared to be helpful mediating their depression and anxiety.

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