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I would like to thank Dr. Leonard Jason for giving me the opportunity to work in the community research lab and for letting me use the data set that made this project possible. I would also like to thank my mentor Sarah Callahan for giving me guidance throughout the project and overall molding me into a better writer. The CSH Undergraduate Research Program funded the following project in summer and fall of 2015.

Motivation for Change in Heroin and Opiate Users

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ABSTRACT Opioid and heroin abuse is a continuing problem in the United States that has been increasing dramatically since 2000. Common treatment programs tend to use methadone and behavioral therapies that do not focus on motivational factors despite the research suggesting it to be an important element to treatment retention and sustained abstinence. Motivation for the purposes of this study is defined as an individual's inner reasons for change. The current study focused on differences in motivation for change among different substance abusers. We found that opiate and heroin abusers had higher motivational scores in comparison to other substance abusers. These results imply that treatment programs should focus on increasing motivation and explore the circumstances and factors that may hinder it.

INTRODUCTION

Approximately 22.5 million Americans or 9.4% of our population struggle with a substance abuse disorder, 7 million of which are strictly opiate abusers (Office of National Drug Control Policy, 2010). According to the Centers for Disease Control (2010), opiate overdose has surpassed automobile fatalities and is the leading cause of accidental death.

Hedegaard and colleagues (2015) indicate that opiate and heroin related deaths have been increasing dramatically since 2000, thus indicating that opiate and heroin abuse is a continuing and growing problem. Though overall opioid abuse has been slightly declining since 2010, heroin use specifically has increased at a rate of 37% per year (Hedegaard, Chen, & Warner, 2015). The following study is comparing heroin and opiate abusers to other substance abusers and exploring potential differences in their initial motivation for changing their substance abusing behavior.

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Part of the overarching issue with heroin abuse in particular is the high relapse rates and inadequate retention of patients in treatment. Hubbard and Marsden (1990) analyzed the rate in which individuals relapse to a certain drug one year after treatment. After taking into consideration what kind of user the individual was (daily, weekly, monthly), heroin ended up having higher relapse rates for daily users (53.6%) than any other drug (Hubbard, Marsden, Rachal, & Hardwood, 1990). For example, 105 patients were followed into the community for one year after leaving methadone maintenance treatment; two-thirds (67.6 percent) of the patients relapsed back to injection drug use (Ball & Ross, 1991).

When looking into the retention rates for treatment programs for heroin users, there is a trend of low retention rates. D'Ippoliti and colleagues followed 1,503 heroin-dependent individuals in methadone, naltrexone, and drug free treatment. The retention rates after the one-year follow-up for methadone therapy was 40%, naltrexone therapy was 18%, and drug-free therapy was 15% (D'Ippoliti, Davoli, Perucci, et al., 1998). If individuals had doses over 60 mg of methadone, then 50% to 70% of individuals were more likely to stay in treatment than those receiving smaller doses, likewise, those in the methadone treatment were 30% more likely than non-methadone individuals to remain in treatment (D'Ippoliti, Davoli, Perucci, et al., 1998). Simpson and Joe (1993) found that 24 percent of their sample (311 heroin-dependent individuals varied into 3 different methadone programs) dropped out within 60 days. The significant predictors of retention were social stability (being married, employed, and having few prior arrests), previous treatment experience, high dosage levels, and motivation for treatment (Simpson & Joe, 1993).

Though methadone therapy has been shown to increase retention of patients, it is not a sufficient solution to reduce relapse. When using methadone in higher doses to treat heroin addiction, one runs into the problem of changing his/her dependency from heroin to methadone. It is clear that other factors, such as motivation for treatment and social stability, need to be considered in treatment when attempting to treat

substance abuse as a whole. Behavioral therapies for substance abuse, such as contingency management (patient is rewarded for not using substances), attempt to remedy this issue, but they do not cover all aspects of motivation, circumstances or readiness for treatment (NIDA, 2012).

Social circumstances such as employment, and mental and physical health are associated with opiate users having a longer abstinent period during treatment follow-ups (Sheehan, Openheimer, & Taylor, 1993). In particular, increased employment and social stability, along with reduction in depression and criminality, were factors that contributed to longer abstinence periods (Sheehan, Openheimer, & Taylor, 1993). Unfortunately, heroin use significantly decreases the likelihood that that an individual will be employed and increases the likelihood that the individual would receive income illegally (Callahan et al. 2015). This indicates that social circumstances are necessary to consider in treatment because it has an effect on abstaining from heroin and opiate abuse.

Motivation and readiness for change are important elements to analyze when considering the success of treatment models. Sampson and Joe (1993) found that motivation for drug abuse treatment is an important component for predicting early treatment dropout. They also suggest that opioid addicts have better holding power in treatment (Sampson & Joe, 1993). These findings imply that opiate abusers in general are more motivated for treatment but other factors, such as employment, marital status, and arrests affect their initial motivation and treatment dropout.

The multiple health and financial risks associated with heroin and opiate use are clear. Thus, heroin and opiate users may be highly motivated to change their drug use. Further, the social circumstances of heroin and opiate users may increase their motivation to change. However, there is a dearth of literature that explores the circumstances, readiness, and motivation for treatment in heroin and opiate users, and comparisons between heroin and opiate users and other drug users have not been made regarding

these constructs. Accordingly, the following study compared the scores between heroin and opiate users and other drug users on the Circumstances, Readiness, and Motivation Scale (CMR), which is used to predict a person's initial circumstances, readiness, and motivation for entering treatment. The results of this study can inform relapse prevention and treatment strategies for heroin and opiate users.

METHOD

Participants

The current research used baseline data from an NIH funded longitudinal study on aftercare treatment models. Recruitment of all participants ($n=270$) was acquired through inpatient substance abuse treatment facilities or reentry/case management programs (see Jason, Olson & Harvey, 2015). Ninety-three percent of participants were recruited from inpatient treatment facilities in which they were currently receiving inpatient services. Five percent of participants were not undergoing treatment during recruitment, but were referred to the project through inpatient facilities. Two percent of participants were referred through reentry/case management services. Twelve participants did not report their primary drug of choice.

Materials

ASI. Data was evaluated through the 5th edition Addiction Severity Index Lite-CF (ASI lite) created by McLellan and colleagues (1992). The ASI lite has been shown to be a reliable (Cronbach's alpha ranged from 0.46 to 0.93) and valid (correlations between ASI severity and composite range from 0.03 to 0.90) structured interview that examines an individual's development in treatment from substance abuse (Makela, 2004, as cited by Callahan, LoSasso, & Olson, 2015). Analyses were conducted using questions regarding demographics (gender, ethnicity, age), education, criminal history, drug of choice, and sources of income over a 30-day period.

CMR. The Circumstances, Motivation, and Readiness scale (CMR) was used to analyze three factors (motivation, circumstances, and readiness) that lead individuals to enter treatment and what made individuals remain in treatment. De Leon, and colleagues (1994) have shown the CMR (aside from the circumstance scale) to be a reliable measure ($\alpha=.86$) when using a standard cohort (cohort A) and two validity cohorts (cohorts B and C). All CMR scores and the log of all time in program, and 30-day retention meet statistical significance (De Leon, Melnick, Kressel, & Jainchill, 1994). There was long-term significance in all scales for cohorts A and C; however, only the readiness scale was significant in cohort B (De Leon et al, 1994). The correlations in the original CMR study show predictive validity in treatment outcomes for long-term treatment (an average of .25 between cohorts) and thirty-day retention (.21 for cohort A and .16 for cohort B) although the long-term retention does not have a lot of power. Analyses in the current study were conducted by using a series of questions regarding each scale. The constructs (circumstances, readiness, motivation) in the current study use the same operational definition as De Leon and colleagues (1994) when the scale was developed. Circumstances were defined as external conations or reasons that influence people to seek treatment (De Leon et al, 1994). An example that was used in the current study was "are you sure you would go to jail if you didn't enter treatment". Motivation was defined as the individual's inner reasons for change (De Leon et al, 1994). An example of a question used to analyze motivation was "Basically, you feel that your drug use is a very serious problem in your life". Readiness was defined as an individual's perceived need for treatment as opposed to other self-change options, such as self-reliance (will power) and the use of external supports (religion, friends, etc.) (De Leon et al, 1994). A sample item of readiness was "basically, you don't see any other choice for help at this time except for some kind of treatment".

Data Analysis

The present study dichotomized the participants' primary substance of choice with individuals

reporting heroin as their primary drug of choice (n=108, coded "1" and all other drugs users n=150, coded 0). We also dichotomously coded ethnicity due to most of the sample containing African Americans and Caucasian individuals (White n=57, coded as 1, all other races n=213, coded as 0; 13 of 200 of the participants included in the other race category did not identify as African American). Table 1 represents the sample as a whole and shows that the sample contains mainly Caucasian and African Americans. Since there was such a small number of people (N=13) in the other category it was decided to include them in the non-White individuals while doing the analysis.

In order to test the hypothesis we used a binomial logistic regression model to explore the likelihood that a heroin and opiate abuser would score differently on the CMR subscales (Circumstances 1 & 2, motivation and readiness for change) than other substance abusers while controlling for gender and race.

Procedure

A survey containing the ASI and CMR was distributed to participants in the Chicagoland area, and each participant received a compensation of \$40 for completing the survey. The survey was administered to participants over a five-year period, but for the purposes of this study only data from wave one was used. The ASI was used to find an individual's drug of choice. A logistic regression was then used to determine what scores on the CMR would predict a person to be a heroin user or not a heroin user. Variables used in the logistic regression include the outcomes of motivation, while circumstances, readiness, and drug of choice serve as independent variables. The model analysis controlled for demographic variables (age, ethnicity and gender).

RESULTS

Sample Characteristics

The total sample contains 270 participants. The sample was 83% male (224) and 17% female

(46). 40.8% of males were heroin/ opiate abusers and 46.7% of women were heroin/ opiate abusers. Overall, 40% of the sample was either heroin or opiate abusers. The sample was 21.1% White, 74.1% African American, 4.8% other races. Table 1 shows demographic, gender, and substance abuse information

Table 1.

	Total Sample (N=270)	Heroin and opiate users (N=108)	Non-heroin/ opiate users (N=150)
<u>Race/Ethnicity</u>			
White	21.1% (57)	52.8% (28)	47.2% (25)
African American	74.1% (200)	39.6% (76)	60.4% (116)
Other	4.8% (13)	30.8% (4)	69.2% (9)
<u>Gender</u>			
Male	83% (224)	40.8% (87)	59.2% (126)
Female	17% (46)	46.7% (21)	53.3% (24)

Regression Results

A logistic regression analysis was conducted to predict whether circumstances, motivation, and readiness to change could predict heroin use after controlling for age, race, and gender. The overall model was significant ($X^2=38.30$, $df=8$, $p=.000$). Further, being White significantly increased the likelihood of being a primary heroin/opiate user ($X^2 = 8.26$, $df= 8$, $N=$, $p=.004$). White individuals are 3.22 times more likely to use heroin/opiates. Older individuals are 6% more likely with each year of age to be heroin/opiate users ($X^2=11.25$, $df = 8$, $p=.001$). Each point on the motivation scale increased by 17% the likelihood that the user would be a heroin/opiate user ($X^2 = 6.92$, $df=8$, $p=.009$). Table 2 shows regression results.

Table 2.

	B	SE	p	EXP (B)
Age	.05	.01	.001*	1.06
Gender	.53	.37	.151	1.70
White_other	1.17	.40	.004*	3.22
Circumstances 1	.03	.05	.508	1.03
Circumstances 2	-.00	.07	.939	.99
Motivation	.15	.05	.009*	1.16
Readiness	-.05	.04	.209	.94
Constant	-4.54	1.59	.004	.011

DISCUSSION

Our hypothesis was supported by our results showing that heroin and opiate users do have significantly more motivation for change than other drug users. The results imply that these particular substance abusers are more willing to change when treatment starts, but other factors, such as circumstances and readiness for change, also need to be considered to have an effect on motivation during treatment. Current treatments are too focused on treating a person on a psychological and biological level and often ignore socioeconomic variables that have shown to impact treatment outcomes. Motivational enhancement therapy (MET) elicits motivation by discussing the individual's substance abuse and then using self-motivational statements (NIDA, 2012). In subsequent sessions for MET the therapist monitors change, reviews cessation strategies being used, and continues to encourage commitment to change or sustained abstinence (NIDA, 2012). The MET does not help individuals who might have issues within their social networks or circumstances, which could explain mixed results with heroin and opiate abusers in MET. These treatments need to embrace substance abusers' motivation or figure out how to motivate individuals throughout the time of treatment. Heroin abusers may be more motivated in general, which helps beginning the process of treatment; however, the current behavior therapies tend to ignore social circumstances that may inhibit treatment and overall make these individuals not ready for

change. Callahan and colleagues (2015) found that heroin abusers are more likely to obtain income illegally in comparison to other substance abusers. Using behavioral therapies along with drug therapy has proven to increase retention in treatment. However, they seem to be insensitive toward circumstantial issues. If counselors understand what makes individuals want to change their behavior or enhance the desire to change, then the counselors have better ideas on how to keep individuals in treatment programs. Behavioral treatments such as MET, contingency management, and community reinforcement could continue to take advantage of the motivational factor along with figuring out how to alleviate circumstantial issues; then perhaps these individuals will be more ready for change.

Our demographic results of Whites being more likely to abuse opiates and heroin have shown to be consistent with current crime statistics. Ohio arrest records of 2012 show that 82 percent of individuals arrested for heroin possession were White (Shoaf, 2012). The actual crime statistics in this state are consistent with our results, thus showing opiate and heroin abusers are likely to be White individuals. Beckett and colleagues (2005) also stated in their study that around 61% and 69% of individuals that injected or snorted cocaine or used heroin were White.

There was not a lot of research that addressed the motivation of specific substance abusers. Therefore, more studies should address motivation to see how big of a factor it is outside of treatment programs in the recovery of opiate and heroin abusers. The effect size of opiate and heroin abusers being more motivated was significant; however, the effect size is small and other studies need to be done to conclude that even though there is a difference, the difference is small. More studies also need to re-evaluate the relapse rate of heroin since it was difficult to find more up to date information on relapse. Our sample size had a large African American sample, which had more heroin/opiate users than other races (N=76). This might not be the case if the sample was evenly distributed among races, and even though heroin/opiate abusers were more likely to be White individuals, it should be retested to see if the results are still the same. The

age results state that opiate and heroin abuser individuals are more likely to be older, but we did not define the specific age in which people are more likely to abuse. It should be tested to make sure it is consistent with current research. Lastly, the literature was unclear as to which behavioral treatments are used the most. Even though there are motivational behavioral therapies, it is unclear how much they are actually used. Also the current motivational therapies are focused on motivating the person without considering social circumstances, which could ultimately reduce motivation. Studies need to be conducted to see if mixed results for motivational therapy are due to

the lack of focus on certain social circumstances such as employment.

It is important to understand that an individual needs to be motivated to proceed with treatment or to even attend a treatment program. Without the initial motivation, the individual is likely to drop out of treatment. The current study has identified that motivated individuals that use substances are likely to be heroin users; thus, substance abuse programs need to focus on not just sustaining motivation for change, but perhaps making programs sensitive toward individuals across various levels of socioeconomic status.

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