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REFERRAL SOURCE, EMPLOYMENT, AND THE RECOVERY OF
UNDERSERVED SUBSTANCE USE TREATMENT CLIENTS

by

Ethan Sahker

A thesis submitted in partial fulfillment
of the requirements for the Doctor of Philosophy
degree in Psychological and Quantitative Foundations in the
Graduate College of
The University of Iowa

August 2019

Thesis Supervisors: Professor Saba Rasheed Ali
Professor Stephan Arndt

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Graduate College
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CERTIFICATE OF APPROVAL

PH.D. THESIS

This is to certify that the Ph.D. thesis of

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the thesis requirement for the Doctor of Philosophy degree
in Psychological and Quantitative Foundations at the August 2019 graduation.

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To my family, Joyce Sahker, Zach Sahker, and Florence Faye Angelo. Their support, education, and encouragement made this all so attainable. To my wife Mai Tanaka Sahker. Without her support, this would be a very different life, and I appreciate her loving sacrifices more than she could possibly know. Now it's your turn!

ABSTRACT

Substance use disorders (SUDs) are a serious public health concern contributing to health risks for individuals and communities. Recovery capital are client strengths associated with SUD recovery. Employment represents recovery capital associated with positive SUD treatment outcomes. However, the relationship between employment mechanisms and SUDs are not well understood. The present study investigates how specific employment variables at SUD treatment intake predict (a) successful treatment completion, (b) abstinence at six-month treatment follow-up, (c) reduced use at six-month treatment follow-up. Additionally, employment variable change is explored. A retrospective, cross-sectional investigation with logistic regression modeling to predict substance use at six-months post SUD treatment follow-up was used. Clients in the study period (1999-2016, N = 8,925) were a mean age of 31.7 (SD=11.8), mostly male (67.2%), and primarily White (86.6%). Results demonstrated that employment variables at intake predicted greater successful treatment completion, Wald $\chi^2_{[36]}=185.3$, $p<0.0001$. However, greater employment strengths were predictive of maintained use at six-month follow-up rather than abstinence or reduced use. Further investigation showed, the best predictors of post-treatment recovery were months employed change (AOR=1.53, 95% CI=1.34-1.75) and days missed from work change (AOR=2.43, 95% CI=2.00-2.96). Counseling psychologists can help to improve substance use outcomes and the quality of life for those in SUD treatment by becoming involved in intervention design, consultation, and policy making that focuses on increasing employment length and reducing absenteeism due to substance use. Employment is one route to engagement that can help to improve the lives for those involved.

PUBLIC ABSTRACT

Addiction affects many people, families, and communities. Treating addiction tends to be coercive, such as criminal justice mandates or family ultimatums. Therefore, completing treatment and staying abstinent is often motivated by avoiding punishment. Alternatively, treatment can focus on people's strengths for motivation to change. Employment is one strength associated with treatment success. However, the specific factors of employment in relation to recovery after treatment is still not well understood.

This research investigates specific some factors of employment that are associated with improved recovery after treatment is completed. A total of 8,925 people who went to addictions treatment in Iowa were surveyed six-months after they completed treatment. This study tested, Current Employment, Occupation, Primary Support Source, Months Employed, Days of Work Missed due to substances use, and Gross Income to see what is associated with recovery.

Results from the study showed that more employment strengths for every category (i.e. full-time employment, greater income) was associated with successful treatment completion. However, these same strengths were surprisingly also associated with greater relapse at six-months post-treatment. Alternatively, an improvement in employment strengths in Months Employed and Days of Work Missed was associated with greater recovery, regardless of what people had at treatment admission.

This means that treatment interventions may be more successful when focused on developing improvements in employment retention and reducing work absenteeism. This may be due to greater internalized or intrinsic motivation, or improvements in self-esteem and self-determination.

TABLE OF CONTENTS

Employment and the Treatment of Substance Use Disorders	1
Introduction.....	2
Employment in a Strength-Based Recovery Framework.....	3
Employment and Substance Use Treatment.....	5
The Present Study.....	6
Methods.....	7
Procedure.....	7
Outcome Variables.....	8
Employment Recovery Capital.....	8
Employment Recovery Capital Change.....	9
Demographic Variables	9
Treatment Variables.....	10
Statistical Analysis.....	10
Results.....	11
Table 1. Demographic and treatment variables at SUD treatment admission stratified by total use outcome.....	12
Treatment Completion.....	13
Six-Month Follow-Up.....	14
Table 2. Logistic models predicting total use at six-month follow-up.....	14
Employment.....	15
Table 3. Employment variable comparisons and differences stratified by treatment completion and total use at six-month follow-up.....	16
Occupation.....	17
Primary support.....	17
Months employed.....	17
Work missed.....	18
Gross monthly income.....	18
Employment Variables with the Greatest Predictive Value.....	18
Employment Variable Change from Admission to Six-Month Follow-Up.....	19
Table 4. Logistic regression models predicting abstinence from employment recovery capital change at six-month follow up.....	20
Figure 1. Percent abstinent by employment variable change at six-month follow-up.....	21
Figure 2. Percent abstinent at six-month follow-up for work missed change by sex.....	22
Discussion.....	22
Limitations.....	25
Clinical Implications.....	26
Conclusion.....	28
References.....	29

LIST OF TABLES

Table 1. Demographic and treatment variables at SUD treatment admission stratified by total use outcome.....	12
Table 2. Logistic models predicting total use at six-month follow-up.....	14
Table 3. Employment variable comparisons and differences stratified by treatment completion and total use at six-month follow-up.....	16
Table 4. Logistic regression models predicting abstinence from employment recovery capital change at six-month follow up.....	20

LIST OF FIGURES

Figure 1. Percent abstinent by employment variable change at six-month follow-up.....	21
Figure 2. Percent abstinent at six-month follow-up for work missed change by sex.....	22

Employment and the Treatment of Substance Use Disorders

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Introduction

Substance use disorders (SUDs) are a serious public health concern contributing to health risks for the individual and their community (Csete et al., 2016; U.S. Department of Health and Human Services, 2016). Sustainable and effective SUD treatment provides relief from the health, social, and economic costs to society and the individual (Marshall et al., 2014; Mundt, French, Roebuck, Manwell, & Barry, 2005; U.S. Department of Health and Human Services, 2016). Employment is associated with SUD treatment completion and contributes to these social and economic benefits. For instance, successfully completing substance use treatment is understood to be associated with greater employment outcomes and reduced criminal involvement (Arndt, Black, Schmucker, & Zwick, 2004; Arria, 2003; Evans et al., 2009; Garnick et al., 2009; Zarkin et al., 2002) . Therefore, substance use treatment succeeds in improving clients' lives and their contribution to the community. In addition, demonstrating the positive economic benefits of treatment improves stakeholder confidence in programs, adding to greater sustainability (Wolk, Hartmann, & Sullivan, 1994). However, much of the research studies focused on the relationship between employment and SUDs evaluates treatment's effect on employment.

More recently, researchers have begun to investigate how employment and education variables contribute to treatment completion (Defulio, Donlin, Wong, & Silverman, 2009; Defulio & Silverman, 2011; Sahker, Toussaint, Ramirez, Ali, & Arndt, 2015). Employment as a predictor of SUD treatment outcomes could help to design interventions supportive of change. For example, knowing that employment referrals have a greater incentive than community referrals for many clients (Sahker et al., 2015)

may inform policy makers to provide more funding for employer assistance programs (EAPs) and employment counseling. Vocational interventions used by counseling psychologists can focus on SUD recovery and gaining employment (Brown & Lent, 2016; Fitzgerald, Chronister, Forrest, & Brown, 2013; Varghese, 2013; Varghese & Cummings, 2013). Yet, current research investigates limited employment variables, and few employment-focused post-treatment studies exist.

The purpose of the present research is to investigate the relationship that multiple employment variables have with abstinence and reduced use at six-month treatment follow-up. The goal of the present study is to investigate if employment interventions would benefit client recovery resources known as *recovery capital*. Few counseling psychologists focus on SUD research and treatment. The present study first introduces the theoretical frameworks of SUD recovery capital and self-determination theory. Next, the intersection of counseling psychology and SUDs are briefly discussed. Finally, the current study is presented.

Employment in a Strength-Based Recovery Framework

Recovery capital is a strength-based approach to SUD treatment comprised of social resources supportive of motivation to change and maintained recovery (Best, Bird, & Hunton, 2015; Granfield & Cloud, 1999, 2001; Groshkova, Best, & White, 2013). Within the recovery capital theoretical framework, strengths present before treatment are associated with greater recovery outcomes and even spontaneous recovery without treatment (Granfield & Cloud, 1999). Factors of recovery capital consist of employment, physical health, mental health, housing, safety, relationships, and life satisfaction domains. The more recovery capital one has, the better the chances of recovery (Best et

al., 2015). Employment serves as a positive support improving one's recovery capital and provides an economic benefit for the community (Best et al., 2015; Granfield & Cloud, 2001; Henkel, 2011). Recovery capital is associated with increased quality of life and long-term recovery (Laudet, 2012; Laudet, Morgen, & White, 2006; Moos & Moos, 2005). Assessing employment variables at treatment admission may help to inform targeted interventions based on individualized recovery capital.

Self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000) has been posited as an overarching conceptual framework for understanding successful SUD treatment (Urbanoski, 2010; Wild et al., 2006; 1998). Self-determination theory suggests that extrinsic sources of motivation (i.e., coercion) are externally regulated and associated with lower motivation (Deci & Ryan, 2000; Ryan & Deci, 2000). Conversely, intrinsic sources of motivation (i.e., life satisfaction) garner greater motivation. Some sources of motivation may be technically extrinsic, but are introjected, identified, or integrated. The introjected, identified, and integrated regulation are more internalized and congruent with one's sense of self, and therefore improve self-determined motivation.

More coercive referral sources are associated with increased successful treatment completion percentages (Sahker et al., 2015; Urbanoski, 2010) and represent extrinsically regulated motivation. Wild and colleagues (2006) demonstrated that extrinsic coercive treatment referrals through the criminal justice system do not actually increase client engagement. Thus, engagement may not be maintained post treatment completion because the coercive value is absent after treatment. Yet, employment represents recovery capital that perhaps represents more integrated regulation in motivation to maintain SUD recovery. More integrated recovery capital may provide improved self-

determination, fundamental needs, and life-satisfaction (Blustein, 2008; Duffy, Blustein, Diemer, & Autin, 2016). Therefore, employment may be a source of recovery capital improving motivation to complete treatment and maintain recovery post-treatment.

Employment and Substance Use Treatment

Employment can be improved with vocational interventions thereby improving recovery (Marshall et al., 2014). Employment can be thought of as a behavior incompatible with drug and alcohol use. By reinforcing behaviors incompatible (employment) with the target behavior (substance use), one can reduce the target behavior (Conyers et al., 2004; Goetz, Holmberg, & Leblanc, 1975; Petscher, Rey, & Bailey, 2009). Currently, the research focused on employment, substance use, and substance use treatment tends to focus on how SUDs contribute to poor vocational outcomes (Arria, 2003; Bray, Zarkin, Dennis, & French, 2000; French, Zarkin, Hubbard, & Rachal, 1991; Zarkin et al., 2002, 2002; Zarkin, French, Mroz, & Bray, 1998; Zarkin, Mroz, Bray, & French, 1998). This research posits there are economic benefits associated with reducing substance misuse. While appealing to taxpayers and grantors, this approach fails in addressing basic needs first. Blustein (2008; 2013) suggests one's work provides a medium for people to fulfill their basic needs of survival, relatedness, and self-determination. Thus, enhancing the working lives of those with substance use problems may be associated with long-term SUD recovery as a source of recovery capital that increases self-determined motivation to change.

Vocational and social class research has already highlighted underserved populations of the jobless, homeless, and forensic populations, which may be related to SUDs (Ali, Fall, & Hoffman, 2012; Liu & Ali, 2005; Liu, Stinson, Hernandez, Shepard,

& Haag, 2009; Varghese, 2013; Varghese & Cummings, 2013). However, finding work is only one aspect of employment. Typically, research with employment and SUDs consider one aspect of employment as the predictor – current employment (e.g., full-time, part-time, unemployed; Adamson, Sellman, & Frampton, 2009; Brewer, Catalano, Haggerty, Gainey, & Fleming, 1998; Defulio et al., 2009; Defulio & Silverman, 2011; Henkel, 2011; Room, 1998). For example, some research has identified current employment (i.e. full-time, part-time, unemployed) as predictive of youth substance use (Wu, Schlenger, & Galvin, 2003) and as a predictor of adult abstinence (Adamson et al., 2009; Brewer et al., 1998; Defulio et al., 2009; Defulio & Silverman, 2011; Henkel, 2011; Room, 1998). Yet, there are additional factors of employment that are unstudied as predictors of recovery post-treatment. Counseling psychologists can help improve on existing SUD treatment research and intervention by investigating other aspects work as a life domain related to SUD recovery.

The Present Study

The present research addresses a critical gap in the literature in need further investigation. Objective employment variables need investigation in terms of predictive value. The information garnered from this study may help support existing evidence-based treatments by improving targeted resource allocation, increasing individual recovery resources, and by improving local economies. In addition, the goal is to engage counseling psychologists in research and treatment for a population understudied in the counseling psychology literature (Martin, Burrow-Sánchez, Iwamoto, Glidden-Tracey, & Vaughan, 2016). The present research addresses the gaps in the literature through the two specific questions. First, are employment variables present at SUD treatment intake

predictive of (a) successful treatment completion, (b) abstinence at six-month treatment follow-up, and (c) reduced use at six-month treatment follow-up? Second, of the employment variables under investigation, which provide the greatest predictive value? It is expected that current employment will predict both abstinence and reduced substance use. In addition, it is hypothesized that other understudied employment variables will predict abstinence and reduced substance use to a greater or lesser extent. It is further hypothesized that current employment will be highly predictive of both Abstinence and Reduced Substance Use after controlling for Sex, Age, Race/Ethnicity, and Education.

Methods

Procedure

Data consisted of a random sample of all clients who attended any substance use treatment program receiving public funding in Iowa. Data were collected from licensed SUD evaluation and treatment programs receiving funding from the state of Iowa. All data were compiled in the Iowa Central Data Repository (CDR) by the Iowa Department of Public Health (IDPH), merged with electronic health files, and assembled into Iowa's client management system (I-SMART). The Iowa Consortium for Substance Abuse Research and Evaluation select yearly random samples from all I-SMART treatment data, conduct six-month follow-up telephone interviews, and compile follow-up data into the Outcomes Monitoring System (OMS). The OMS data were used for the present study. IDPH approved the use of a deidentified and concatenated OMS dataset for years 1999 to 2016 (N = 8,925). The median follow-up rate in the last 10 years is 80.5%. It is 79% since 1999. Admission data, as well as follow-up data, are client self-reported. Because these data represent de-identified existing program evaluation information, no informed

consent was given and the University Human Subjects Office, Institutional Review Board exempted this study from review.

Outcome Variables

The first outcome was Total Use of primary problem substance at six-month SUD treatment follow-up. Substance use frequency was originally entered as no use in past 6 months, no past month use, 1-3 times in past month, 1-2 times per week, 3-6 times per week, and daily use. Use frequency was recoded into Total Use, consisting of three discrete categories including Abstinence (no use at follow-up; n = 4,408), Reduced (lower use comparing admission and follow-up; n = 1,497), and Maintained (same or increased use at follow-up; n = 3,026). Secondary outcome variables include Treatment Completion and Abstinence. Treatment Completion is a dichotomous variable consisting of successful and unsuccessful treatment completion. Counselor rated assessment defines successful completion as treatment plan completion, fully or substantially. Unsuccessful completion consists of all other reasons for program termination. Abstinence is a dichotomous variable including those who reported abstinence or non-abstinence at follow-up.

Employment Recovery Capital

Employment variables in the model include (a) Employment, (b) Occupation, (c) Primary Support, (d) Past Six Months Employed (Months Employed), (e) Days of Work Missed due to substances use in the past 30 days (Work Missed), and (f) Gross Income. Employment consists of full-time, part-time, unemployed/looking, and not in labor force. Occupation consists of none, professional/managerial, sales/clerical, crafts/operatives, laborers, farm, and service/household. Primary Support consists of none, wages,

family/friends, public assistance (including all federal/state income programs), retirement, disability, and other. Months Employed, Gross Income, Work Missed are continuous variables.

Employment Recovery Capital Change

Each of the six employment variable's change from admission to six-month follow-up was grouped as increased, no change, or decreased increased. Continuous variables (i.e. Months Employed, Work Missed (Days), Gross Income) were simply categorized by change at follow-up. Categorical variables were treated as ordinal in terms of most employment capital. Primary support consisted of wages, other supports, and no support. A move from no support to other support (i.e. friends and family, public assistance) was determined to be an increase. Occupation was dichotomized to no occupation and any occupation. Change from nothing to something was treated as an increase. Employment was ordered from most to least recovery capital as such: full time, part time, unemployed-looking, out of the labor force. These variables may not represent true ordinal values in that part time is neither better nor worse than full time employment. However an assessment of recovery capital works by adding individual assets one has to form an index score (Arndt, Sahker, & Hedden, 2017). The present research explores if an ordinal change in employment recovery capital is indeed meaningful.

Demographic Variables

Control variables in the model include Sex, Age at Treatment Admission, Race, and Ethnicity. Race and Ethnicity were recorded by treatment agency staff as two separate and overlapping variables.

Treatment Variables

Treatment variables were recorded at admission and discharge status was recorded at treatment conclusion. Treatment variables include Primary First Use Age, Treatment Setting, Primary Substance, Primary Frequency, and Treatment Discharge Status. Primary First Use Age is the age of the client when they first used their primary problem substance. Treatment Setting includes extended outpatient, intensive outpatient, high intensity clinically managed, low intensity clinically managed, continuing care, medical and detox, and no treatment recommended. Treatment Setting is in line with the American Society of Addiction Medicine (ASAM) criteria (Mee-Lee, Shulman, Fishman, Gastfriend, & Miller, 2013). Primary Substance includes alcohol, marijuana, methamphetamine, cocaine, opiates and synthetics, heroin, other prescription drugs, and other (low frequency drugs). Primary Use Frequency includes no use in past six months, no past month use, 1-3 times in past month, 1-2 times per week, 3-6 times per week, and daily use. Referral Source includes criminal justice, self, healthcare provider, alcohol/drug abuse provider, employment/other, and DHS. Due to low frequencies employment (including employee assistance programs [EAP]), other individual, and school referrals had to be collapsed into the “other” category.

Statistical Analysis

Analyses were conducted using SAS 9.4. The primary test will analyze the association of employment recovery capital variables on Total Use at six-months post SUD treatment, which includes (a) abstinence and (b) reduced use, and (c) maintained/increased use. First, employment recovery capital is investigated predicting treatment completion. Second, six-month follow-up total use is investigated using

bivariate multinomial logistic regressions for each employment variable. Third, effects are presented for each employment variable. Fourth, follow-up bivariate logistic regressions are used to assess employment variable change predicting abstinence at six-month follow-up. Fifth, to assess unique contributions, each significant employment change variable is assessed through a backward selection procedure. Change variables that remain in the model are then adjusted for number of problem substances, race, ethnicity, sex, and age. Finally, interactions are tested.

Because of the larger sample size ($N = 8,925$) and multiple tests, small differences have a greater probability to reach statistical significance. To adjust for the potential inflation in the Type I error rate, alpha will be set at $p < 0.01$. Differences between Total Use subcategories are calculated using Mann-Whitney U tests with Probabilistic Index ($P_{x>y}$) effect sizes for continuous variables (Acion, Peterson, Temple, & Arndt, 2006; Grissom & Kim, 2012). A probability ($P_{x>y}$) of 0.50 indicates a 50% probability x is greater than y and would indicate no effect. Chi-square tests with risk difference (RD) effect sizes are used for categorical variables. RD is the inverse of number needed to treat (NNT; Grissom & Kim, 2012). For instance, an RD of 5 equals an NNT of 20 ($5/100 = 1/20$). Odds ratios (OR) were used for both Total Use and Abstinence likelihood effects. RDs greater than $|5|$ are considered clinically meaningful effects in accordance with previous research (Sahker et al., 2015; St. Marie et al., 2015).

Results

Table 1 shows client demographics and treatment variables stratified by Treatment Completion and Total Use. The primary outcome of Total Use at six-month follow-up consisted of abstinence (49.8%), reduced use (16.5%), and maintained use

(33.7%). Clients from the full sample were a mean age of 31.7 ($SD=11.8$), mostly male (67.2%), primarily White (86.6%) and non-Hispanic/Latino (96.1%). Outpatient care comprised the majority of service modalities with extended outpatient (63.6%) and intensive outpatient (17.5%) settings. Client treatment completion was mostly successful (61.2%).

Table 1.

Demographic and treatment variables at SUD treatment admission stratified by total use outcome

Variable	Total (%)	Treatment Completion (%)		Six-Month Follow-Up Total Use (%)		
		Successful	Unsuccessful	Abstinence	Reduced	Maintained
	N=8,925	n = 5,452	n = 3,455	n = 4,443	n = 1,473	n = 3,009
Demographic Variables						
Age at Admission $M(SD)$	31.7(11.8)	31.9(11.9)	31.5(11.6)	33.3(12.0)	31.8(11.6)	29.5(11.3)
Sex						
Female	32.8	30.8	35.8	36.2	34.9	26.6
Male	67.2	69.2	64.2	63.8	65.1	73.4
Race						
Caucasian/White	86.6	88.4	83.7	86.5	86.1	86.9
African Am/Black	11.0	9.2	13.7	10.9	11.5	10.9
Other/Multiple	1.4	1.5	1.3	1.5	1.3	1.4
Native American	1.0	0.9	1.3	1.1	1.2	0.9
Ethnicity						
Not Hispanic/Latino	96.1	95.9	96.4	96.1	95.6	96.2
Puerto Rican	0.5	0.5	0.4	0.4	0.9	0.4
Mexican	2.1	2.3	1.7	2.1	2.0	2.1
Cuban	0.0	0.0	0.1	0.1	0.0	0.0
Other Hispanic/Latino	1.4	1.3	1.5	1.4	1.5	1.3
Clinical Variables						
Primary First Use Age $M(SD)$	17.4(7.2)	17.4(6.6)	17.6(8.1)	18.0(8.0)	16.9(6.9)	16.9(6.0)
Treatment Setting						
Extended Outpatient	63.6	66.9	58.4	62.6	47.2	73.2
Intensive Outpatient	17.5	14.5	22.3	16.5	25.5	15.1
High Intensity Clinically Managed	11.0	11.0	11.0	11.1	24.2	4.2
Low Intensity Clinically Managed	1.8	1.5	2.3	2.3	1.2	1.4
Continuing Care	5.9	5.9	5.8	7.2	1.5	6.1
Medical and Detox	0.2	0.2	0.1	0.2	0.4	0.0
No Treatment Recommended	0.0	0.0	0.0	0.0	0.1	0.0

Note. Percentages may not add to 100 due to rounding; SUD, substance use disorder; M , mean; SD , standard deviation.

Table 1 (Continued).*Demographic and treatment variables at SUD treatment admission stratified by total use outcome*

Variable	Total (%) N=8,925	Treatment Completion (%)		Six-Month Follow-Up Total Use (%)		
		Successful n = 5,452	Unsuccessful n = 3,455	Abstinence n = 4,443	Reduced n = 1,473	Maintained n = 3,009
Primary Substance						
Alcohol	49.5	53.7	43.0	46.2	48.5	55.1
Marijuana	25.4	24.4	27.0	24.7	26.2	26.1
Methamphetamine	17.0	15.7	18.9	20.7	15.1	12.3
Cocaine	4.8	3.4	6.8	4.9	4.8	4.5
Opiates and Synthetics	1.6	1.4	2.0	1.9	2.7	0.8
Heroin	0.7	0.5	1.0	0.5	1.6	0.5
Other Prescription drugs	0.6	0.5	0.8	0.6	1.0	0.5
Other	0.4	0.4	0.4	0.5	0.3	0.3
Primary Frequency						
No Use in Past 6	13.2	15.0	10.5	17.7	0.0	13.2
No Past Month Use	30.9	33.4	26.8	34.8	0.1	40.2
1-3 Times in Past Month	23.0	22.9	23.2	20.7	17.1	29.4
1-2 Times Per Week	11.0	10.2	12.1	7.7	19.4	11.6
3-6 Times Per Week	8.0	7.2	9.4	6.6	21.9	3.4
Daily	13.9	11.3	18.0	12.5	41.6	2.3
Referral Source						
Criminal Justice	58.0	63.1	50.0	57.0	43.4	66.8
Self	11.1	8.5	15.1	10.6	19.0	8.0
Healthcare Provider	4.7	3.7	6.2	4.3	10.1	2.6
Alcohol/Drug Abuse Provider	11.5	11.3	11.9	12.4	13.8	9.1
Other	10.9	10.1	12.2	11.4	10.4	10.5
DHS	3.8	3.3	4.5	4.5	3.4	3.0
Number of Substances						
0	46.5	49.2	42.2	44.6	45.5	49.9
1	23.9	24.4	23.3	24.4	22.5	24.0
2	13.4	12.4	15.1	14.2	13.0	12.6
3+	16.1	14.0	19.5	16.9	19.0	13.6

Note. Percentages may not add to 100 due to rounding; SUD, substance use disorder; DHS, department of human services; *M*, mean; *SD*, standard deviation.

Treatment Completion

All six employment variables predicted greater successful treatment completion in univariate models. Successful treatment completion was predicted by Employment, Wald $\chi^2_{[3]} = 117.11, p < 0.0001$. The largest effect was seen comparing full-employment to unemployed and looking, OR = 1.77, 95% CI = 1.58-1.98. Occupation predicted successful treatment completion, Wald $\chi^2_{[6]} = 55.13, p < 0.0001$. Effects range in size,

favoring claiming an occupation compared to no occupation, OR = 1.22 to 1.69. Primary Support predicted successful treatment completion, Wald $\chi^2_{[6]} = 98.28, p < 0.0001$. The greatest effect was demonstrated in support received from wages versus none, OR = 1.548, 95% CI = 1.38-1.74. Months Employed predicted successful treatment completion, Wald $\chi^2_{[1]} = 60.50, p < 0.0001$. The odds of successful treatment completion increased for each additional month employed, $p < 0.001$, OR = 1.07, 95% CI = 1.04-1.08. Work Missed (Days) predicted successful treatment completion, Wald $\chi^2_{[1]} = 16.44, p < 0.0001$. The effect of days missed from work due to substance use was significant but quite small, OR = 0.996, 95% CI = 0.995-0.998. Finally, Gross Income significantly predicted successful treatment completion with a small positive effect, Wald $\chi^2_{[1]} = 51.16, p < 0.0001$, OR = 1.021, 95% CI = 1.015-1.027.

Six-Month Follow-Up

Six-Month Follow-up regression analyses are represented in Table 2. The multivariate omnibus multinomial logistic regression predicting Total Use was significant, $p < 0.0001$. Additionally, all seven univariate tests were significant, $p < 0.001$.

Table 2.

Logistic models predicting total use at six-month follow-up

	Wald χ^2	df	p value
Multivariate Omnibus Test	185.31	36	<.0001
Univariate Test			
Current Employment	99.26	6	<.0001
Current Occupation	74.59	12	<.0001
Primary Support	127.67	12	<.0001
Months Employed	69.73	2	<.0001
Work Missed (Days)	17.76	2	<.001
Gross Income	26.54	2	<.0001

Note. α set at $p < 0.01$; df, degrees of freedom.

While all employment variables significantly predicted Total Use at six-month follow-up, differences between abstinence and reduced use versus maintained use were predictive in unexpected directions. Greater employment capital at admission was associated with lower abstinence and reduced use compared to maintained use at treatment follow-up. Clinically meaningful effect sizes were seen in at least one subcategory per employment variable. To interpret clinical meaningfulness, percentages with differences are presented in Table 3. Note that more recovery capital predicts greater treatment completion. However, the differences are reversed for six-month follow-up. Additionally, the reduced use group demonstrated greater differences than the abstinence group favoring maintained use.

Employment. Employment demonstrated significant differences between groups, $\chi^2_{[6]} = 99.7, p < 0.0001$. Those who were employed full-time at admission were less likely to be abstinent versus maintained at six-month follow-up. However, the difference was not clinically meaningful at the cutoff of $|5|$, $RD = -4.8$. Those who were employed full-time were less likely to demonstrate reduced use compared to maintained use, with a meaningful difference, $RD = -9.5, 95\% CI = -12.3 - -6.8$. Those who were unemployed and looking for work were also more likely to reduce use compared to maintain use, $RD = -7.7, 95\% CI = -10.5 - -4.8$. Moreover, those who were unemployed and looking at admission had the greatest percentage of abstinence (31.3%) and reduced use (34%) at follow-up. Those not in the labor force were more likely to reduce use than maintain use, $RD = -6.8, 95\% CI = -9.5 - -4.1$. No employment category in the abstinence group demonstrated a clinically meaningful difference compared to maintained use.

Table 3.*Employment variable comparisons and differences stratified by treatment completion and total use at six-month follow-up*

Variable at Admission	Treatment Completion			Total Use at Six-Month Follow-Up				
	Successful (%) n = 5,452	Unsuccessful (%) n = 3,455	Successful Vs. Unsuccessful Difference	Abstinence (%) n = 4,443	Reduced (%) n = 1,473	Maintained (%) n = 3,009	Abstinence Vs. Maintained Difference	Reduced Vs. Maintained Difference
Employment ^{a,b}								
Employed full time	34.0	24.9	9.1	29.6	24.9	34.4	-4.8	-9.5
Employed part time	15.9	13.9	2.0	13.9	13.0	17.9	-4.0	-4.9
Unemployed-looking	27.1	35.5	-8.4	31.4	34.4	26.8	4.6	7.7
Not in labor force	23.1	25.8	-2.7	25.1	27.8	21.0	4.1	6.8
Occupation ^{a,b}								
None	40.9	48.3	-7.4	46.0	49.4	37.7	8.3	11.7
Prof/Managerial	4.3	3.3	1.0	3.9	3.8	3.9	0.0	-0.1
Sales/Clerical	6.3	6.1	0.2	6.0	5.4	6.9	-1.0	-1.5
Crafts/Operatives	5.5	3.9	1.7	4.6	4.4	5.6	-1.0	-1.2
Laborers	29.3	25.6	3.6	26.6	25.3	30.9	-4.4	-5.6
Farm	2.1	1.8	0.3	1.9	1.9	2.1	-0.2	-0.2
Service/Household	11.7	11.1	0.6	11.1	9.8	12.9	-1.8	-3.1
Primary Support ^{a,b}								
None	18.5	22.4	-3.9	22.4	21.5	15.8	6.5	5.7
Wages	48.6	38.2	10.4	43.0	37.2	50.6	-7.6	-13.4
Family/Friends	23.4	29.4	-6.0	24.5	29.7	25.6	-1.1	4.2
Public Assistance	2.8	2.8	0.0	3.2	3.1	1.9	1.3	1.2
Retirement	0.7	0.6	0.1	0.8	1.0	0.3	0.4	0.6
Disability	2.1	2.3	-0.2	2.5	1.9	1.9	0.6	0.0
Other	3.9	4.3	-0.5	3.6	5.6	3.8	-0.2	1.8
Past Six Months Employed <i>M(SD)</i>	3.0(2.6)	2.6(2.6)	0.4 ^c	2.6(2.6)	2.7(2.6)	3.2(2.6)	-0.6 ^c	-0.5 ^c
Days Missed work/school <i>M(SD)</i>	6.3(22.8)	8.4(26.0)	-2.1 ^c	8.0(25.9)	7.5(24.4)	5.6(20.9)	2.4	1.9 ^c
Gross Monthly Income† <i>\$M(SD)</i>	649.55(840.37)	516.61(820.21)	132.94 ^c	566.40(792.41)	560.75(872.93)	663.36(872.38)	-96.96 ^c	-102.61 ^c

Note. † centered at its mean; **Bold**, clinically meaningful effect; M, mean; SD, standard deviation.^a p < 0.001 chi square test for difference comparing Treatment Completion^b p < 0.001 chi square test for difference comparing Total Use at six-month follow-up^c p < 0.001 Wilcoxon signed ranks test

Occupation. Occupation demonstrated significant differences between groups, $\chi^2_{[12]} = 74.9, p < 0.0001$. Client occupation at admission was associated with Total Use at follow-up in an unexpected direction. In general, not having an occupation was associated with greater abstinence and reduced use at six-month follow-up. Those claiming no occupation fared the best in both the abstinent group (46.0%) and reduced use group (49.4%). Both demonstrated clinically meaningful differences, RD = 8.3, 95% CI = 6.1 - 10.6 and RD = 11.7, 95% CI = 8.5 - 14.8, respectively. Additionally, Laborers were less likely to reduce use than they were to maintain use with a clinically meaningful difference, RD = -5.7, 95% CI = -8.1 - -3.2.

Primary support. Primary support demonstrated significant differences between groups, $\chi^2_{[12]} = 129.4, p < 0.0001$. Primary support at admission was associated with Total Use at follow-up in an unexpected direction. In general, having more financial support was associated with less abstinence and reduced use. Those reporting no financial report were more likely to demonstrate abstinence and reduced use compared to maintained use at follow-up, RD = 6.6, 95% CI = 5.7 – 8.3 and RD = 5.7, 95% CI = 3.2 – 8.2, respectively. Conversely, those reporting wages as their primary support were less likely to be abstinent or reduce use compared to maintained use RD = -7.5, 95% CI = -9.8 - -5.2 and RD = -13.4, 95% CI = -16.4 - -10.3, respectively.

Months employed. Both abstinence (Mann-Whitney U = 7336230, $p < 0.0001$) and reduced (Mann-Whitney U = 1993687.5, $p < 0.0001$) groups were associated with fewer months employed than the maintained use group. The effect size was small comparing the abstinence group to the maintained group, $P_{x>y} = 0.56$. The difference between reduced and maintained use also demonstrated a small effect, $P_{x>y} = 0.45$.

Work missed. Comparing abstinence and maintained use groups revealed no differences, $p = 0.02$. The reduced use group had more days missed from work due to substance use than did the maintained use group, but the effect was not meaningful in size, Mann-Whitney $U = 2408151$, $p < 0.0001$, $P_{x>y} = 0.55$.

Gross monthly income. In general, the abstinent and reduced use groups earned less income than the maintained use group at six-month follow-up. The abstinent group demonstrated significantly less gross monthly income than the maintained group, but the effect was not meaningful in size, Mann-Whitney $U = 6780096$, $p < 0.0001$, $P_{x>y} = 0.53$. Additionally, the reduced use group made significantly less money than the maintained group, but the effect was again not meaningful in size, Mann-Whitney $U = 1906175$, $p < 0.0001$, $P_{x>y} = 0.45$.

Employment Variables with the Greatest Predictive Value

Initially, the present study hypothesized that employment recovery capital present at admission would predict greater abstinence. However, the opposite was true in almost every case. Nonetheless, all employment variables were loaded onto a full model with backward elimination to see which of the six employment variables are providing unique contributions predicting Total Use.

When all employment variables were loaded into the final model with a backward selection criteria, only three variables remained with a removal criteria set at $p = 0.01$: Employment, Primary Support, and Months Employed remained significant. Occupation, Days Work Missed, and Gross Monthly Income did not provide unique contributions to the model and were removed from the model. Employment, Primary Support, and Months Employed were statistically significant and remained in the model. After

controlling for Race, Ethnicity, Number of Substances, and Age at Admission, adjusted odds ratios (AOR) were relatively unchanged. Greatest change when adding control variables was seen comparing those who receive primary support from disability versus no support.

These findings provide little clinical utility as they suggest full-time employment, no occupation, and more months employed are associated with greater maintained substance use at six-month follow-up. Additional analyses were used to explore employment recovery capital change as a predictor of abstinence.

Employment Variable Change from Admission to Six-Month Follow-Up

Employment variable change predicting abstinence is presented in Table 4. In the multinomial model, the reduced use group demonstrated greater differences than the abstinence group compared to maintained use. Reduced use percentages were associated with less employment recovery capital in nearly every comparison. Thus, variable change analyses used Abstinent ($n = 4,443$) versus Non-Abstinent ($n = 4,482$) group differences. To explore recovery capital change from admission to follow-up, univariate logistic regression analyses were performed predicting abstinence from employment variable change. Each variable's change from admission to six-month follow-up was grouped as increased, no change, or decreased.

Increases and no changes in recovery capital from admission to follow-up were associated with the greater abstinence at follow-up. Five of the six employment variables significantly predicted abstinence at follow-up in univariate models, at least $p < 0.01$. Only Primary Support was non-significant, $p = 0.0104$. As a result, Primary Support was excluded from the backward selection multivariate model. The backward selection model

revealed only two employment variables were contributing unique contributions to predicting abstinence. Only Work Missed Change and Months Employed Change remained significant.

Table 4.

Logistic regression models predicting abstinence from employment recovery capital change at six-month follow-up

Variables	df	Wald χ^2	p value	OR	95% CI	Adjusted Wald χ^2	Adjusted p value	AOR	95% CI
Univariate Models									
Employment Change	2	10.98	<.01						
Occupation Change	2	15.81	<.001						
Primary Support Change	2	9.13	=.0104						
Months Employed Change	2	31.03	<.0001						
Work Missed Change	2	107.25	<.0001						
Gross Income Change	2	19.38	<.0001						
Selection Model^a									
Work Missed (Days) Change	2	116.77	<.0001			113.66	<.0001		
Increased				ref				ref	
No Change				2.48*	2.10-2.92			2.67*	2.23-3.12
Decreased				2.39*	2.00-2.86			2.43*	2.00-2.96
Months Employed Change	2	41.56	<.0001			51.55	<.0001		
Increased				1.43*	1.27-1.61			1.53*	1.34-1.75
No Change				1.14*	1.01-1.29			1.14	0.99-1.31
Decreased				ref				ref	
Occupation Change	2	0.55	=.76			2.30	=0.32		
Employment Change	2	1.47	=.48			2.83	=0.24		
Gross Income Change	2	3.87	=.14			3.95	=0.14		
Added in Adjusted Model^b									
Number of Substances	2					4.70	=0.20		
Race	3					0.80	=0.85		
Ethnicity	4					2.75	=0.60		
Sex	1					50.82	<.0001		
Male								ref	
Female								1.43*	1.30-1.58
Age at Admission	1					139.12	<.0001		
Per 1 year increase								1.024*	1.020-1.029

Note. df, degrees of freedom; CI, confidence interval; OR, odds ratio; AOR, Adjusted Odds Ratio controlling for sex, age, race, and ethnicity.

^a Backward selection criteria set to $p = 0.01$. Non-significant variables were excluded from the adjusted model.

^b Adjusted model included Work Missed Change, Months Employed Change, Number of Substances, Race, Ethnicity, Sex, and Age at Admission.

* Odds ratio significantly different than 1.

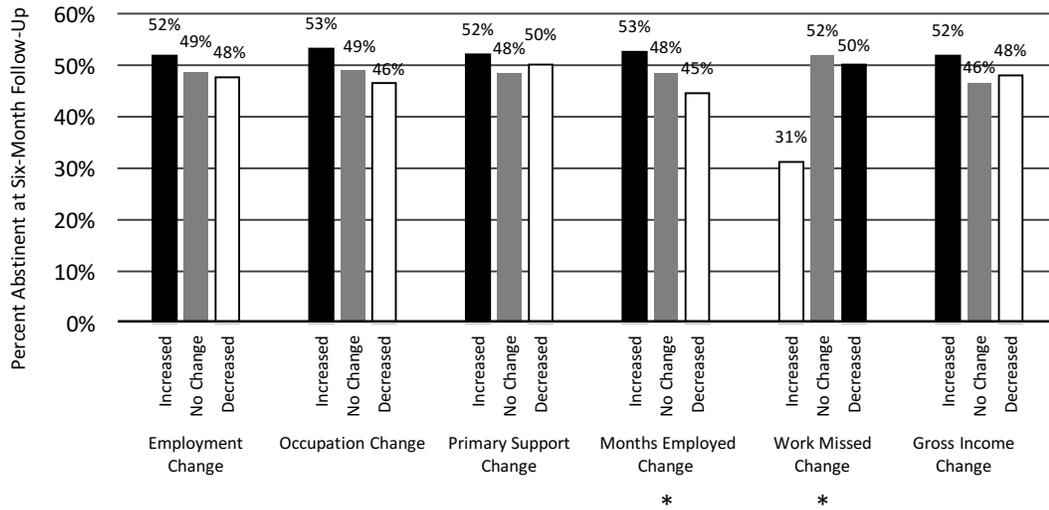
Effects remained relatively stable after controlling for number of substances, race, ethnicity, sex, and age. Age at admission and sex were significant in the adjusted model.

Figure 1 demonstrates significant abstinence differences associated with Work Missed

Change and Months Employed Change. Work missed shows a particularly disparate difference comparing increased and decreased days of work missed due to substance use.

Figure 1.

Percent abstinent by employment variable change at six-month follow-up.



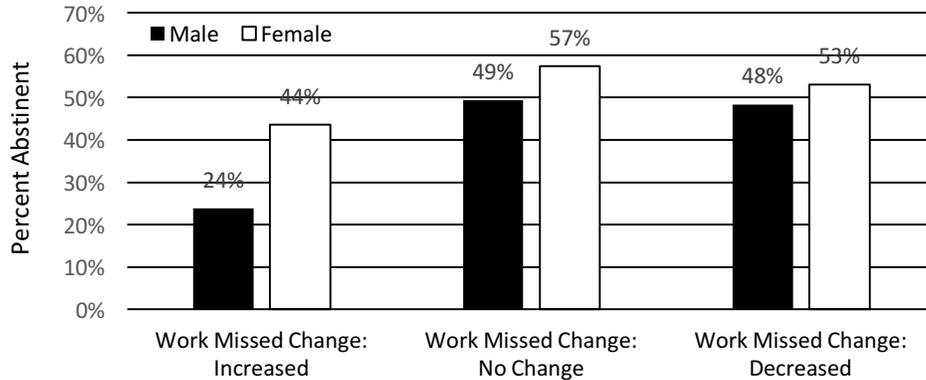
Note. All six employment change variables with the percent abstinent at six-month follow-up. Primary Support was non-significant in initial univariate tests. Only Work Missed and Months Employed remained significant in the backward selection multivariate model and adjusted model.

* = significant at $p < 0.001$.

Subsequent interaction terms were non-significant, except for sex by work missed change, Wald $\chi^2_{[2]} = 12.22, p < 0.01$. Figure 2 demonstrates the significant interaction. The percent abstinent associated with increased days missed change at six-month follow-up were intensified in male clients.

Figure 2.

Percent abstinent at six-month follow-up for work missed change by sex.



Discussion

The present research addresses a critical gap in the counseling psychology literature by assessing the importance of objective employment variables in the treatment of SUDs. First, employment variables present at intake were hypothesized to be predictive of (a) successful treatment completion, (b) abstinence at six-month treatment follow-up and (c) reduced use at six-month treatment follow-up. This hypothesis was partially supported. Employment variables as recovery capital predicted greater successful treatment completion. However, more employment recovery capital was also predictive of maintained use at six-month follow-up rather than abstinence or reduced use. Second, the employment variables under investigation were assessed for predictive value. However, the clinical utility of this information was irrelevant as more employment capital predicted greater maintained use. Finally, employment variable change from treatment admission to six-month follow-up was investigated. Results from

employment variable change demonstrated that increased time employed and decreased days missed from work due to substance use predicted abstinence at six-month follow-up. Effects were maintained when controlling for race, ethnicity, age, sex and number of substances. Additionally, predicted abstinence at six-month follow-up associated with work missed change depended on client sex. Men demonstrated less abstinence than women with increased days missed from work due to substance use.

It was expected that current employment would predict both abstinence and reduced substance use at six-month follow-up. This assumption was based on literature demonstrating current employment predicts successful treatment completion and abstinence, respectively (Adamson et al., 2009; Brewer et al., 1998; Defulio et al., 2009; Defulio & Silverman, 2011; Henkel, 2011; Room, 1998). This association was not found to be the case. While all employment variables predicted successful treatment completion, the same variables were actually associated with maintained use at treatment follow-up. This may demonstrate that motivation to complete treatment and motivation to reduce use or remain abstinent are different, and recovery capital may not be the mechanism of change. For instance, self-determination theory (Deci & Ryan, 2000; Ryan & Deci, 2000) posits that behavior is associated with differential outcomes depending on extrinsic or intrinsic motivation. Extrinsic motivation is associated with compliance contingent on external reward or punishment. Integrated or intrinsic motivation is associated with personal values and life satisfaction. In regard to SUD treatment, Wild et al. (2006) suggest that external incentives, or treatment coercion, can provide a strong motivation to complete treatment. This incentive to complete treatment is most obvious when clients experience a threat of sanctions, such as imprisonment or other legal

pressures (Urbanoski, 2010). However, substance use after treatment may not pose the same coercive value, and employment recovery capital may not provide the same value-based incentives. For example, employment capital such as income could provide more opportunities to use via access to more disposable income. The present sample was overwhelmingly referred by criminal justice sources, which may explain employment variable associations with successful treatment completion, but low abstinence and reduced use at follow-up.

The present findings demonstrating employment capital present at admission predicts greater maintained use at follow-up is contrary to research on recovery capital (Granfield & Cloud, 1999). For instance, more recovery capital should be associated with increased long-term recovery (Laudet, 2012; Laudet et al., 2006; Moos & Moos, 2005). The present study demonstrated the opposite effect of employment capital. However, recovery capital is dynamic and it can improve over time (Best et al., 2012; Hibbert & Best, 2011; Moos & Moos, 2005). The present research does support the notion of self-determination in employment change through continued improvement of employment capital in treatment. The present research demonstrated that those who increased their employment recovery capital were more likely to be abstinent at six-month follow-up, even when controlling for race, ethnicity, age, sex, and number of substances. This change may be a function of personal growth evidenced through employment achievements, representing greater self-determination. Self-determination itself may be part of recovery capital.

Findings demonstrated that improvement in nearly all employment variables from admission to six-month follow-up was associated with greater abstinence. Employment

Change, Occupation Change, Months Employed Change, Work Missed Change, and Gross Income Change were all significant in univariate models. Yet, a variable selection procedure highlighted that Months Employed Change and Work Missed Change are responsible for the unique contributions predicting abstinence. This finding contributes to the counseling psychology literature by highlighting important points of intervention. For instance, Months Employed may be a measure of a behavior incompatible with substance use (Conyers et al., 2004; Goetz et al., 1975; Petscher et al., 2009) and policy can focus more resources at employment based interventions such as employment assistance programs (EAPs), vocational counseling, interventions aimed at increasing employment length. The sex by days missed change interaction adds more nuance to these findings. These findings suggest that employment length is important for both males than their female counterparts. However, work missed (days) due to substance use has a pronounced association with males; who were associated with a smaller percentage of abstinence at six-month follow-up than females.

Limitations

This research has limitations of note. First, only objective employment variables were used to predict recovery. There may be multiple subjective employment variables that are important to recovery that have yet to be investigated. For instance, environmental sources of happiness (Warr, 2007), outcome expectations and self-efficacy (Brown & Lent, 2013; Lent, Brown, & Hackett, 1994), or social class associations with treatment and recovery (Liu et al., 2009) may be points of entry into a more communitarian approach (Liu & Ali, 2005). Second, employment referral source did not occur with enough frequency to investigate. Employment referrals are predictive of

substance use treatment completion (Capraro, 2000; Marzell, Sahker, Pro, & Arndt, 2016; Sahker et al., 2015; St. Marie et al., 2015) and successful completion of substance use treatment is associated with improved employment outcomes (Arndt et al., 2004; Arria, 2003; Evans et al., 2009; French et al., 1991; Garnick et al., 2009; Zarkin et al., 2002). However, it is unclear if employment referrals generate the intrinsic motivation supporting longer-term recovery post treatment. Further research should be done to investigate the association between employment referral and abstinence at treatment follow-up.

Third, the present sample represents a population attending treatment centers receiving federal or state funding. Generally, the present sample exemplifies a treatment population representative of a lower social class/socioeconomic status. This sample limits the generalizability of the present findings. However, these clients also represent an underrepresented section of the U.S. In addition, those from lower social class backgrounds are the most in need of supported employment interventions. Thus, the limitation of the present research can alternatively be seen as a strength as those involved may be in need of the greatest attention. Finally, the present sample represents only one Midwestern state with its own employment and treatment needs. This also limits generalizability to a Midwestern and more rural than urban population.

Clinical Implications

Counseling psychologists working with clients experiencing SUDs may improve client engagement by focusing on employment recovery capital change. In addition, vocational psychologists can help break down mental health barriers hindering working lives and maintenance of gainful employment (Blustein, 2008). SUDs represent one

barrier, and employment recovery capital may be one route to engage clients in both SUD and mental health treatment. Furthermore, many values in counseling psychology are at issue in SUD treatment (Martin et al., 2016). For example, counseling psychologists' identity is partly based on (a) a strength-based approach, (b) vocational psychology, and (c) commitment to multiculturalism and social justice (Gelso & Fretz, 2001; Gelso, Williams, & Fretz, 2014). All of which are paramount to the present state of SUD treatment. Therefore, attention to the strength-based approach of recovery capital change and work are promising directions for counseling psychologists to engage the needs clients in SUD recovery.

The present findings suggest that interventions in SUD recovery may be improved with attention to vocational growth, or positive changes in months employed and days of work missed due to substance use. Additionally, it was discovered that employment status (i.e., part-time, full-time), months employed, gross income, and source of support, were associated with successful treatment completion. However, these same employment factors were associated with less post-treatment recovery. Factors actually associated with recovery were improvements in maintaining a job and absenteeism. Thus, focusing on client self-determination growth involved with work could foster strengths in recovery capital that improve abstinence post-treatment. Work fulfills the needs of survival and power, social connection, and self-determination (Blustein, 2013). All of which may be part of recovery capital change in SUD recovery.

In addition, finding decent work is an essential aspect of well-being and opportunity, especially among those from marginalized social class backgrounds (Duffy et al., 2016). The present study only included clients receiving state or federal funding for

treatment. Many of these clients may be from underrepresented and marginalized social class or socioeconomic backgrounds. Despite that, those who had the volition to improve their station by increasing the number of month employed, demonstrated better abstinence outcomes. The clinical implications involved with simultaneously improving work and SUDs can create positive change in communities. Counseling psychologists are well trained for leadership in this role.

Conclusion

Counseling psychologists can help to improve use outcomes and the quality of life for those in SUD treatment by becoming involved in intervention design, consultation, and policy making that focuses on improving employment recovery capital. While the presence of employment recovery capital at admission was associated with treatment completion, it was not associated abstinence or reduced use at six-month follow-up. Instead, improving recovery capital from treatment admission to six-month follow-up was associated with greater abstinence. This improvement may serve as validation of client self-determination through internalized or intrinsic regulation. In addition, important employment recovery capital associated with greater abstinence was months employed and worked missed due to substance use. The present findings suggest that research and practice could focus more on finding decent work, increasing employment length, and decreasing days missed from work due to substances. In essence, focusing on more internalized motivating factors of self-improvement may provide greater motivation to change. These changes may be seen in improved accomplishments in one's work life. Because many counseling psychologists specialize in employment and vocational counseling, we are well positioned to lead research and intervention in this area. The

SUD treatment realm is a relatively new territory ripe for increased attention and action in counseling psychology. Many social justice issues are present in the SUD population. Employment recovery capital is one route to increase engagement that can help to improve the lives for those struggling with substance use.

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