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Substance Abuse Relapse in Oxford House Recovery Homes: A Survival Analysis Evaluation

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Abstract

Background—This study used survival analysis to examine risk factors for substance abuse relapse among residents in Oxford Houses (OH) a national network of self-run, self-financed aftercare homes for individuals recovering from substance use disorders.

Methods—Participants who entered OH within 60 days of a one-year longitudinal study ($N=268$) were selected from of a nationally representative U.S. sample. Discrete-time survival analysis compared baseline risk of relapse to four hypothesized survival models that included time-invariant and time-varying factors across three subsequent time periods.

Results—The model predicting higher risk for more severe substance use disorders and psychiatric problems was supported. The hypothesized model that predicted time-varying increases in alcohol (but not drug) abstinence self-efficacy significantly affected risk of relapse. Hypothesized demographic and employment variables did not significantly predict relapse risk.

Conclusions—Results suggested that OH recovery homes may reduce relapse by providing closer monitoring and referring additional services to new residents with more severe prior addiction severity. Risk for relapse may also be reduced by enhancing abstinence self-efficacy for alcohol regardless of drug of choice.

Keywords

Oxford House; substance abuse treatment; aftercare settings; relapse; survival analysis; abstinence self-efficacy

INTRODUCTION

Individuals with substance use disorders may improve their chances to maintain sobriety after treatment by living in aftercare settings that are substance-free and provide social

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AUTHOR CONTRIBUTIONS

Dr. Harvey had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Dr. Jason is the first author's advisor, dissertation committee chair, and principal investigator (PI) of the grant which generated this research data. Dr. Ferrari was on the first author's dissertation committee and co-PI of the grant which generated this research data.

The authors declare that they have no conflicts of interest.

support to prevent relapse^{1,2}. The current study is the first to use discrete-time survival analysis statistical techniques to examine the risk for alcohol and other drugs (AOD) relapse among a U.S. national sample of residents of *Oxford Houses* (OHs). OHs are an international network of over 1,700 aftercare settings sharing similar traits: all OHs are non-professional, self-run, self-financed, and require residents to remain abstinent from AOD with no maximum length of stay³.

Factors affecting risk for AOD relapse after treatment include addiction severity, co-occurring psychiatric disorders, employment, and changes in abstinence self-efficacy. Higher Addiction Severity Index (ASI) scores for drug use and employment problems predicted relapse in 224 parolees in weekly drug counseling⁴. Pedersen & Hesse⁵ adapted the ASI to produce a Risk of Alcoholic Relapse Scale and found it to predict relapse at 6 months and three years after treatment based on addiction severity. Langdon et al.⁶ reviewed the characteristics of 128 clients in repeated AOD treatments in the U.K. and found that comorbid psychological disorders to be among the strongest predictors of relapse and re-admission. Xie et al.⁷ performed a ten-year prospective study of 223 individuals with co-occurring psychiatric disorders and substance use disorders. Xie et al. found men, participants with less than a high school education, and those who lived independently versus in a group setting had higher risk of relapse. In a study of 53 substance abuse treatment participants, Kushner et al.⁸ found that clients with comorbid AOD problems and anxiety (55% of their sample) relapsed more frequently in a 4-month post-treatment follow-up than those individuals assessed with AOD problems alone. Low rates of employment have also been associated with AOD relapse^{9,10}. Gaining employment can increase self-esteem and self-efficacy, autonomy, and better functioning and increased skills in daily living¹¹, and stable employment can reduce relapse risk¹². Finally, Brown¹³ found significantly higher levels of self-efficacy at three months for a group of abstainers compared to a relapse group, and abstainers had increased their self-efficacy scores from baseline to three months, while the relapse group's self-efficacy scores decreased. Brown concluded that effective coping resources – self-efficacy and good social support – moderated the effects of significant life adversity that lead to lower relapse rates. Davis and Jason¹⁴ found that longer length of stays in an OH increased abstinence self-efficacy for 87 men and women OH residents.

The current study proposed four hypotheses affecting hazard ratios compared to baseline. 1) Participants who were younger, un-married, and with fewer years of education, would have significantly higher hazard ratios than older, married, and more educated participants. 2) Study participants who had shorter lengths of sobriety, more previous treatments, and higher ASI composite scores for alcohol problems, drug problems, and psychiatric problems, would have higher hazard ratios. 3) Participants with ASI scores indicating more severe problems with employment, lower initial income upon entry into OH, and fewer days employed, would predict significantly higher hazard ratios. 4) Participants whose self-efficacy scores increased over time will have lower hazard ratios. The present study the first study to use survival analysis techniques to examine the relationship between demographic and psychological variables to predict relapse among OH residents.

METHODS

Research Participants

Data were taken from an archival data set of a study conducted by DePaul University researchers in 2000-2003 of 897 men and women participants already living in 170 OHs in a U.S. national sample. Data was gathered at baseline and at three subsequent periods at day 120, 240, and at the end of one year. The current study selected new residents who had entered OH within ± 60 days of the beginning of the original study, replicating a similar selection technique performed on other OH studies^{15,16}. This resulted in 268 cases at baseline consisting of 162 men and 106 women.

Measures

The *Addiction Severity Index-Lite* ASI-Lite:¹⁷ assesses problem areas commonly related to AOD problems. This study used ASI data taken at baseline for age, marital status, education; alcohol problem severity composite scores and number of alcohol treatments; drug problem severity composite score and number of drug treatments; employment composite scores, days employed in the last 30 days, and income from employment in the last 30 days; and psychiatric problem severity composite scores. ASI composite scores ranged from 0 to 1.

Alcohol and Drug Abstinence Self-efficacy—At baseline and at day 120, 240, and at the end of one year, participants were administered the 20-item *Alcohol Abstinence Self-Efficacy* scale (AASE)¹⁸ and the *Drug Abstinence Self-Efficacy* scale (DASE). The AASE/DASE asked respondents to indicate how confident (from 0% to 100%) participants were in resisting alcohol/drug use in 20 high-risk situations using a 5-point Likert scale. The DASE was modified such that the words “drink alcohol” were replaced by the words “use drugs.”

Relapse Measure—Miller and Del Boca’s¹⁹ *Form 90 Timeline Follow Back* (modified to record 120 days rather than 90 days) to measure past alcohol and drug use was administered at baseline and at three subsequent periods at day 120, 240, and at the end of one year. A triggering event for relapse occurred if the participant answered positively to any use of drugs or alcohol.

Procedure

The research project was conducted under the supervision of DePaul University’s LRB and IRB Review and received approval as a secondary data analysis project. The DePaul IRB classified this project as non-reviewable on November 14, 2013. DePaul University IRB granted permission for this study as a non-renewable exempt study on the condition that all data could not be traceable to the original participants.

We constructed baseline survival curves and hazard ratios using the lifetables technique using the statistical package SPSS version 21. We then entered hypothesized variables into the Cox proportional hazard regression models that compared the resulting hazard ratios against the baseline hazard ratio. If the hazard ratio with covariates differed significantly from the baseline ratio, the null hypothesis was rejected. We also used Cox proportional hazard regression models entering the time-varying AASE and DASE values as covariates at

baseline and across each discreet data-gathering periods at day 120, 240, and at the end of one year. If the model using time-varying covariates affected the hazard ratio compared to the baseline ratio for that discreet time period, the null hypothesis was rejected.

RESULTS

Table 1 shows the demographic information of the 268 participants, means of variables, and comparisons with noteworthy p -values based on gender. By the end of the study, 87 participants reported no use, 75 had relapsed, and 102 had dropped out of the study. The mean survival time was 308 days (95% CI 296.4-322.6). Comparisons of all the demographic variables between the no use, relapsed, and dropped groups were not significant.

Table 2 displays the hazard ratios, confidence intervals, and p -values for each of the hypothesized variables entered into the Cox proportional hazards regression models. Cox proportional hazards regression analyses indicated that demographic (age, level of education, and marital status), and employment factors (ASI employment composites, days of paid work in the last 30 days, and income from work in the last 30 days) were not associated with significant effects on hazard ratios compared to baseline ratios.

Cox proportional hazards regression indicated the number of previous treatments for alcohol was significant, such that one additional alcohol treatment episode was associated with a 6.7% increase in the hazard ratio. The number of previous treatments for drugs was also significant, such that one additional drug treatment episode was associated with an 8.4% increase in the hazard ratio. ASI alcohol composite scores were also significant; for each .10 increase in the ASI alcohol composite was associated with an increase in the hazard ratio by 82%. ASI psychiatric severity was also significant, such that each .10 increase in the ASI psychiatric composite was associated with an increase in the hazard ratio by 28%. However, days since last substance used and the ASI drug severity composite scores were not significantly associated with hazard ratios.

Cox proportional hazards regression using time-varying AASE and DASE self-efficacy composites at each 120-day time point indicated significant differences compared to the baseline hazard ratios, Wald $\chi^2(2) = 27.75, p < .001$. Individually, the effect of alcohol abstinence self-efficacy (AASE) was significant, such that each additional unit in alcohol self-efficacy at each 120-day time point was associated with a decrease the hazard ratios by 1.2%. However, drug abstinence self-efficacy (DASE) was not significantly associated with hazard ratios, $B = .001$, Wald $\chi^2(1) = .120, p = .729$, $\text{Exp}(B) = 1.001$.

DISCUSSION

The goal of this study was to determine what factors were associated with risk for relapse among residents living in OH over a period of one year. Results indicated that higher ASI scores for alcohol problems, psychiatric severity, and the greater number of prior alcohol or drug treatment episodes prior to enter OH predicted higher risks for relapse. The period of greatest hazard is the first 90 days of the study, with 18% (31 participants) relapsed during this interval. Hazard reduced slightly between days 180 and 270 to 16%. This supports

previous OH research that found stays of six months or more promoted long-term recovery^{20,21}.

It was surprising only increases in alcohol abstinence self-efficacy significantly affected hazard. These findings suggested a possible lack of instrument sensitivity in measuring drug versus alcohol self-efficacy, and that conflating situational triggers for using drugs and alcohol might be misguided. El-Sheikh and Bashir found differences in abstinence self-efficacy based on substances and situations between former alcohol and heroin groups using two different measures²². Similarly, Sklar and colleagues²³ compared self-efficacy scores of 344 alcohol and 253 cocaine clients in treatment and found that the alcohol group had lower self-efficacy scores in interpersonal conflict situations, whereas the cocaine group had lower self-efficacy scores in temptation-related situations.

This study has potential limitations. It is unknown what effects the ± 60 -day selection window had on relapse; the rationale for this selection allowed for a substantial increase in data while avoiding exposing or depriving participants 1/3 or less of the six-month dosage found to be effective in prior OH studies^{20,24}. Another limitation of this study is the paucity of data gathered at each time period that were expected to vary across time, such as employment and income, which could have had significant effects on relapse. Finally, there were no distinctions among this sample to designate primary AOD of choice. As only increases in alcohol abstinence self-efficacy significantly reduced hazard ratios in this study, future research should distinguish primary drug of choice to explore potential alcohol and drug self-efficacy interactions.

Conclusion

There are compelling benefits for examining the phenomenon of relapse that occur over time in specific settings²⁵. Kushner et al.⁸ concluded that pre-screening for comorbid disorders such as anxiety and depression should be used as a marker for potential relapse relative to singly diagnosed clients. Knowledge of relapse factors of previous participants could inform intake and screening procedures and could help determine whether a setting is appropriate for the individual^{26,27}. In addition to matching clients to settings, analysis of the patterns and timing of relapse can alert staff or co-residents to emphasize certain aspects of treatment to individuals, or offer additional resources for vulnerable populations at specific phases of treatment^{28,29}. In short, awareness of client factors related to relapse in OH could advance treatment matching and person-environment fit to improve outcomes³⁰. Future research on OH using survival analysis techniques and relapse could reveal such relationships and should be encouraged.

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Table 1
Participant Socio-demographic and ASI Variable Comparisons at Baseline

	Sample (N=268)	Male (n=162; 60.1%)	Female (n=106; 39.9%)		
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>p</i>	η^2
Age	35.17 (8.94)	36.01 (9.00)	33.91 (8.75)	.06	
Education (months)	149.44 (26.57)	150.96 (24.54)	147.14 (29.34)		
Employment					
Days paid work last 30 days	11.67 (11.40)	12.11 (11.12)	10.96 (11.86)		
Employment income last 30 days	\$479.45 (\$754.43)	\$608.86 (\$874.73)	\$280.26 (\$453.85)	**	.05
Length of sobriety (days)					
Alcohol	298.03 (661.67)	345.90 (741.36)	225.99 (514.24)		
Drugs	345.31 (951.22)	406.42 (1105.57)	253.35 (648.04)		
Number of previous treatments (lifetime)					
Alcohol	2.98 (4.59)	3.59 (5.49)	2.03 (2.36)	**	.03
Drugs	2.91 (3.37)	3.02 (3.89)	2.74 (2.42)		
Prior criminal charges	4.90 (7.20)	4.99 (7.43)	4.75 (6.86)		
ASI Composite Scores (.00-1.00; lower is better)					
Medical	.25 (.26)	.24 (.28)	.27 (.24)		
Alcohol	.16 (.11)	.16 (.11)	.15 (.11)		
Drug	.08 (.05)	.07 (.04)	.08 (.05)		
Legal	.14 (.19)	.13 (.18)	.16 (.19)		
Family/Social	.30 (.16)	.27 (.16)	.34 (.16)	**	.06
Psychiatric	.19 (.23)	.18 (.22)	.22 (.23)		
Employment (reverse scored)	.61 (.30)	.62 (.30)	.61 (.31)		

	% (n)	% (n)	% (n)	<i>P</i>	
Race/Ethnicity					
White/Caucasian	66.4 (178)	68.3 (110)	63.6 (68)		
Black/African American	26.1 (70)	23.0 (37)	30.8 (33)		
Hispanic/Latino	4.9 (13)	6.2 (10)	2.8 (3)		
Other	2.6 (7)	2.5 (4)	2.8 (3)		
Marital status					
Never married	49.6 (133)	49.7 (80)	49.5 (53)		
Divorced//widowed	29.4 (78)	31.7 (51)	25.2 (27)		
Separated	16.0 (43)	13.0 (21)	20.6 (22)		

	% (<i>n</i>)	% (<i>n</i>)	% (<i>n</i>)	<i>P</i>	
Married	4.1 (11)	3.7 (6)	4.7 (5)		

*
p 0.05

**
p 0.01

Table 2
Covariate Analyses of Individual Variables using Cox Proportional Hazards Regression

Covariate	B	SE	Wald χ^2	<i>p</i>	Hazard Ratio (95% CI)
Age	-.001	.013	.011	.92	.99 (.97-1.03)
Marital Status					
Never Married (<i>n</i> =133)	–	–	4.18	.243	–
Married (<i>n</i> =11)	-.477	.258	3.41	.065	.621 (.37-1.03)
Separated (<i>n</i> =43)	.250	.609	.168	.682	1.28 (.39-4.24)
Divorced/Widowed (<i>n</i> =78)	-.283	.358	.626	.43	.75 (.37-1.52)
Level of Education	.002	.004	.263	.61	1.00 (.99-1.01)
# Previous Treatments for Alcohol	.065	.031	4.50 *	.034	1.07 (1.00-1.13)
# Previous Treatments for Drugs	.081	.028	8.40 **	.004	1.08 (1.03-1.15)
ASI Alcohol Composite	2.11	.99	4.58 *	.033	8.23 (1.18-57.24)
ASI Drug Composite	3.31	2.91	1.29	.256	27.42 (.091-8306.06)
ASI Psychiatric Problems Composite	1.03	.50	4.28 *	.039	2.80 (1.06-7.42)
Days since last Used	-.001	.001	3.08	.079	.99 (.998-1.00)
ASI Employment Composite	-.385	.375	1.05	.305	.68 (.326-1.42)
Days employed last 30 days	.010	.010	.877	.349	1.01 (.99-1.03)
Income from employment last 30 days	.000	.000	.002	.960	1.00 (1.00-1.00)
Alc. Abstinence Self-Efficacy	-.012	.004	9.37 **	.002	.988 (.980-.996)
Drug Abstinence Self-Efficacy	.001	.004	.120	.729	1.001 (.994-1.009)

*
p 0.05

**
p 0.01