

ABSTRACT

FITZPATRICK, DAVID, C. Recovery Factors in a Social Recovery Program for Homeless Individuals Implementing Addiction Recovery Management Principles. (Under the direction of Dr. Edwin Gerler).

The primary purpose of this study was to determine significant demographic and substance use factors leading to successful completion of a long-term, residential, social recovery program for homeless people that implements Addiction Recovery Management principles. An ex post facto research design was used with data gathered from all clients who entered the recovery program between the years 2008 and 2010. The sample included 1084 male and 674 female admissions representing 1394 unique individuals. The impact of the variables of Gender, Race, Age, Veteran Status, Drug of Choice, Age of First Use, Length of Use and New/Return Client was investigated. Logistic regression was used to analyze the data, assess the eight hypotheses and generate two prediction models.

The findings indicated that significant group outcome differences existed for client gender, age and race with males, older clients and Caucasians more likely to have completed the program. Other variables did not show significant differences between those who completed the sobriety program and those who did not. Although veteran status was not a significant factor, there was a significant interaction effect between veteran status and age and veteran status and race. The interaction between veteran status and race rendered the main effect of race as not significant. A statistically significant prediction model was generated using stand alone variables as well as one using variables with interaction terms. Suggestions of possible causes for the discovered disparities, recommendation for further research and implications for policymakers are discussed.

© Copyright 2012 by David C. Fitzpatrick

All Rights Reserved

Recovery Factors in a Social Recovery Program for Homeless Individuals Implementing
Addiction Recovery Management Principles

by
David C. Fitzpatrick

A dissertation submitted to the Graduate Faculty of
North Carolina State University
in partial fulfillment of the
requirements for the Degree of
Doctor of Philosophy

Counseling and Counselor Education

Raleigh, North Carolina

2013

APPROVED BY:

Edwin R. Gerler, Jr., EdD
Committee Chair

Helen S. Lupton-Smith, PhD

Stanley B. Baker, PhD

Karen Bullock, PhD

BIOGRAPHY

Mr. David Fitzpatrick is a business manager at IBM as well as a clinical counselor with experience in inpatient, intensive outpatient, outpatient and detoxification settings. He is a Licensed Clinical Addictions Specialist Associate, Licensed Professional Counselor Associate, Certified Rehabilitation Counselor and Certified Professional Project Manager. He has been employed as a manager at IBM since 1999 and has over 20 years of experience in the business world. He has worked as a clinician at Fellowship Health Resources, the Alcohol Treatment Center of Raleigh and as a Detox Monitor in a non-profit recovery and rehabilitation facility.

He received a Bachelor of Arts in Economics, a Bachelor of Arts in French and a Bachelor of Science in Business Administration from Appalachian State University; a Master of Science in Management from North Carolina State University; a Master of Science in Clinical and Substance Abuse Counseling and a Master of Science in Rehabilitation Counseling from East Carolina University; and is a PhD candidate in Counseling and Counselor Education at North Carolina State University.

Mr. Fitzpatrick is dedicated to providing compassionate and empathetic service to those underserved populations that are affected by substance abuse and mental illness. He participates in various leadership and advocacy activities for the homeless citizens of Wake County, North Carolina. He currently serves on and is the past vice-chair of the Wake County Fitness Council. He is on the Board of Director of the Healing Place of Wake County. For the last six years, he has earned the President's Volunteer Service Award in recognition of his community service.

His first journal publication, Replication analysis in exploratory factor analysis: What it is and why it makes your analysis better, appeared in the *Journal of Practical Assessment, Research and Evaluation* in November, 2012.

ACKNOWLEDGEMENTS

I would like to thank and recognize the following people for their valuable contribution to achieving this milestone:

Dr. Edwin Gerler, my dissertation chair and advisor, provided me with valuable guidance from our first discussion of entering the PhD program to the completion of my dissertation. He has been a continuous inspiration filled with wisdom, compassion and dedication to helping others. Dr. Gerler had more confidence in me than I had in myself and drove me to believe that I can make a difference. My graduate committee of Dr. Stanley Baker, Dr. Helen Lupton-Smith and Dr. Karen Bullock provided a wonderful experience in class as well as expert guidance in the writing of my dissertation.

My wife, Linda, has been my friend, confidant and biggest supporter for the last many years. She has transformed my life in ways I never thought possible. She is the one who keeps me grounded and provides the glue to hold the family together. My sons, Tim and Charlie, watched me change and inspired me to keep going. My parents, Wendy and Michael, my brother, Paul and sister, Elizabeth, have supported me throughout.

Mr. Chris Budnick provided mentorship and inspiration. Chris has impacted the lives of so many people in dedicating his life to those who are so often overlooked in society.

Ms. Marianne Hurley displayed the confidence to take me as her partner in counseling during my practicum, internship and my first counseling job. She provided advice and showed me the power of counseling for those with substance use issues.

Mr. John Moran encouraged me, made accommodations to facilitate my pursuit of this goal and provided guidance on work/life balance.

TABLE OF CONTENTS

LIST OF TABLES	vii
LIST OF FIGURES	viii
CHAPTER I—INTRODUCTION.....	1
Purpose.....	4
Research Questions.....	4
Summary of Method	6
Limitations	6
Terms and Definitions.....	7
The Shelter.....	7
Recovery.....	8
Addiction Recovery Management.....	9
Social Recovery Program.....	9
Homelessness.....	10
Conclusion	10
CHAPTER II—REVIEW OF THE LITERATURE.....	11
Inclusion Criteria	11
Substance Abuse in Homeless Populations	12
Social Recovery Programs.....	19
Addiction Recovery Management	31
Conclusion	39
CHAPTER III—METHOD	41
Research Design.....	41
Profile of Participants/Program.....	42
Instrumentation	43
Procedure	44
Data collection.....	44
Data analysis.....	45
Description of data elements/scales/categorization.....	46
Hypotheses.....	48
Conclusion	50
CHAPTER IV—RESULTS.....	51
Introduction.....	51
Assumptions.....	51
Linearity.....	51
Independence of errors.....	52
Multicollinearity.....	52
Incomplete information from the predictors.....	53
Complete separation.....	53
Skew/Kurtosis.....	53
Residuals	54
Construct Validity.....	55

Descriptive Statistics.....	55
Hypothesis Testing.....	56
Hypothesis 1-Gender.....	57
Hypothesis 2-Race.....	57
Hypothesis 3-Age.....	59
Hypothesis 4-Veteran Status.....	61
Hypothesis 5-Drug of Choice.....	62
Hypothesis 6-Age of First Use.....	64
Hypothesis 7-Length of Use.....	65
Hypothesis 8-New/Return Client Status.....	66
Interactions.....	67
Prediction Model.....	71
Conclusion.....	74
CHAPTER V—DISCUSSION.....	75
Summary of Findings.....	75
Limitations and Generalizability.....	83
Implications for Practice and Policymakers.....	84
Implications for Further Research.....	85
Conclusion.....	87
REFERENCES.....	88
APPENDICES.....	99
Appendix A-- List of Dependent and Independent Variables with Valid Data Values.....	100
Appendix B-Data Cleaning.....	101
Appendix C--Descriptive Statistics.....	102
Appendix D-- IRB Approval.....	104

LIST OF TABLES

Table 1	Test of Linearity of Continuous Variables	52
Table 2	Variables in the Equation.....	56
Table 3	Descriptive Statistics of Race Variable	58
Table 4	Matrix Comparison of Racial Outcome Data	59
Table 5	Descriptive Statistics of Age Group Variable.....	60
Table 6	Matrix Comparison of Age Group Outcome Data.....	60
Table 7	Descriptive Statistics of Drug of Choice Variable.....	62
Table 8	Descriptive Statistics of Age of First Use Variable.....	64
Table 9	Descriptive Statistics of Length of Use Variable.....	66
Table 10	Variables in the Equation with Interactions.....	72
Table 11	Variables in Model 1 Equation	73
Table 12	Variables in Model 2 Equation	74
Table 13	Descriptive Statistics of Continuous Variables	102
Table 14	Descriptive Statistics of Categorical Variables	103

LIST OF FIGURES

Figure 1--Interaction of Veteran Status and Racial Group	69
Figure 2--Interaction of Veteran Status and Age	70
Figure 3--Interaction of Veteran Status and Age Group.....	71

CHAPTER I—INTRODUCTION

Substance abuse treatment among homeless people had been investigated extensively. While 235,823 homeless individuals were admitted to treatment programs in 2009, research findings suggest that services are still lacking for substance abuse treatment overall and particularly among homeless populations (Substance Abuse and Mental Health Services Administration [SAMSHA], 2006; Tucker, Wenzel, Golinelli, Zhou, & Green, 2011). Some of the most notable research findings in this area suggest: (a) substance abuse treatment can be effective and lead to sustained recovery in homeless individuals (Dietz, 2007; Zerger, 2002), (b) substance abusing homeless populations are underserved and often overlooked by treatment programs and outreach efforts (Maguire, Sheahan & White, 2012), (c) substance abuse treatment programs must use a different set of skills to engage and retain homeless clients as opposed to those who are not homeless and, (d) effective engagement and retention of homeless individuals in treatment includes providing housing and case management (Stahler & Stimmel, 1995; Zerger, 2002).

Likewise, much research has addressed social recovery programs. The finding of this body of research indicates that social recovery programs can be equally effective as professionally lead programs while being more cost effective (Kaskutas, 1999; Kaskutas, Ammon, & Weisner, 2003; Stahler & Stimmel, 1995). It can also be argued that social recovery programs are more attractive to homeless populations because the leaders are peers who tend to share the experience of addiction with homeless clients.

Finally, much research on the framework of Addiction Recovery Management (ARM) is appearing. This framework promotes addiction as a chronic disease which requires

long-term care (Kelly & White, 2011; White, Boyle, & Loveland, 2002; White & Sanders, 2008). The ARM framework recommends proactive engagement, extended follow-up checkpoints, early intervention in cases of relapse and the use of indigenous support for recovery. Despite the extensive research conducted on these subjects individually, scant research appears in the literature that specifically addresses factors of recovery for homeless people in social recovery programs that implement ARM principles. Hser and Anglin (2011) concur, noting that very little research has been conducted on recovery factors outside of professional treatment programs.

This dissertation presents an analysis of recovery factors for self-reported homeless individuals participating in a long-term, residential, social recovery program that implements ARM principles. The program is a non-profit, homeless shelter with an optional long-term recovery program located in the southeastern United States and is referred to in this dissertation as the “Shelter.”

As stated previously, social, peer-led recovery programs are considered to be particularly appealing to homeless populations due to the fact that peer counselors tend to share common experiences of substance abuse and recovery, mental illness, oppression and/or discrimination. Additionally, homeless shelters provide housing, which is viewed as one of the most important factors leading to successful recovery (Kaskutas, 1999; Stahler & Stimmel, 1995). Finally, these programs implement an array of interventions defined in the literature as effective for homeless populations suffering from substance abuse and other mental health disorders.

Statement of the Problem

Substance abuse and homelessness have a long history of coexistence (Levinson & Ross, 2012), but there is very little agreement on the number of those affected. Studies vary widely, providing prevalence ranges of between 2% and 86% for alcohol abuse and between 2% and 70% for abuse of other drugs among various homeless sub-populations (Zerger, 2002). It is also estimated that 86% of homeless individuals have experienced alcohol or other drug (AOD) and/or mental health problems at some time in their lives and 67% have experienced one of these problems within the last month (Zerger, 2002). The National Coalition for the Homeless (2009) and Milby et al. (1996) agree on an estimate for substance abuse prevalence of 20%-35% among homeless individuals as a whole. The substance abuse issues of each affected individual also affects countless family members, friends, other loved ones and society as a whole. With such high numbers of the homeless populations affected by substance abuse issues and a lack of extensive research on treatments other than those offered by professional treatment facilities, it is important to conduct research on the factors that lead to successful recovery in alternative treatment programs.

It is anticipated that this study of the significant factors leading to sustained recovery should facilitate and inspire further qualitative and quantitative research aimed at increasing the completion rate of the Shelter's recovery program. It is also hoped that the results of this study will assist other researchers and program administrators in developing methods for engagement and retention of individuals at the Shelter and other alternative and traditional recovery programs.

Purpose

The findings of this study will help the Shelter and other such programs better understand the differences between those who successfully complete their program and those who do not. Given that the client completion rate for the Shelter's recovery program is only approximately 9% of those who start the program, it is anticipated that this study will lead to further research investigating program elements that can be modified and supports that can be implemented to increase the completion rate and, hence, recovery rate. However, as this study has an ex post facto research design, it does not seek to identify the cause of any significant differences in substance abuse recovery factors.

Research Questions

The Shelter recovery program is a residential, long-term, social recovery program which lasts between 12 and 18 months (depending on satisfactory progress) and implements Addiction Recovery Management principles. The Shelter's outcome analysis demonstrates that 70% of clients remain sober one year after completing the program but only approximately 9% who start the program finish it. The research conducted in this dissertation examined factors that are hypothesized to influence the completion of the sobriety program at the Shelter. Group differences were analyzed and logistic regression analysis was conducted to generate a prediction model using the recovery factors that demonstrated a significant difference between those who complete the program and those who do not. More specifically, the research conducted analyzed the following factors to determine their contribution to successful program completion: gender, race, age group,

veteran status, age of first use, length of use and whether the client is new to the program or a return client.

The following questions were addressed:

1. Is there is a significant gender group difference between those who complete the program and those who do not? It is predicted that the completion rate of men is higher than that of women.
2. Is there is a significant racial group difference between those who complete the program and those who do not? It is predicted that the completion rate of Caucasians¹ is higher than that of other races.
3. Is there a significant age group difference between those who complete the program and those who do not? It is predicted that there is no difference in completion rates based on age.
4. Is there a significant veteran status group difference between those who complete the program and those who do not? It is predicted that the completion rate for veterans is higher than that of non-veterans.
5. Is there a significant drug of choice group difference between those who complete the program and those who do not? It is predicted that there is a difference in completion rate based on drug of choice.
6. Is there a significant age of first use difference between those who complete the program and those who do not? It is predicted that the

¹ The terms for race used in this dissertation match those that are used on the intake form at the Shelter.

completion rate for those whose first use is after the age of 18 is higher than those clients whose first use is at 18 or under.

7. Is there a significant length of use difference between those who complete the program and those who do not? It is predicted that the completion rate for those who have used substances for a shorter period of time is higher than those clients who have used for longer.
8. Is there a significant difference between those who have had multiple treatments at the Shelter and those who have not? It is predicted that the completion rate for those clients who have entered the program more than once is higher than those who are on their first entrance.

Summary of Method

This dissertation research uses an ex post facto sample of 1758 self-identified homeless individuals who have been admitted to the recovery program at the Shelter. It reports survey information using percentages for group and dichotomous data variables and mean and standard deviation for continuous data variables. Logistic regression analyzes group and continuous variable differences and generates the best possible prediction model. Logistic regression provides an advantage over chi-square analysis by holding all other variables constant while measuring the variable of interest to the researcher.

Limitations

The ability to establish causality in this study is limited in that the data is ex post facto. Ex post facto design is used in cases when the participants can not be randomly assigned to groups and the independent variables can not be manipulated by the researcher.

A cause and effect relationship can not be determined using an ex post facto design (Fraenkel & Wallen, 2008; Heppner, Wampold, & Kivlighan, 2008). This study may be limited by the fact that clients at the Shelter seek treatment voluntarily, are self-identified as homeless and the population is geographically homogeneous. While this may be a limitation to generalizing to all populations, it is an advantage in determining interventions that can be applied to the specific populations being studied. The sample may also present limitations by differing from the population of all homeless individuals, all individuals in a social recovery program, all substance abusers and/or homeless substance abusers in a recovery program that does not implement ARM principles. As such, generalizability is limited. Mono-operational bias may be present as there is a single measure of completion and, hence, recovery. It is acknowledged that individuals who dropped out of the program may have gained sufficient skills and knowledge to have reached the definition of recovery prior to completion of the program. There has been limited post-treatment follow-up with those who did not complete the program.

Terms and Definitions

The Shelter. The Shelter is a non-profit recovery and rehabilitation facility for self-admitted, homeless people with alcohol and drug abuse or dependency. Its mission is to offer innovative and cost-effective social, peer-led recovery and rehabilitation services and to rekindle the desire of clients to lead a sober, meaningful life. There are separate men's and women's facilities located approximately 10 miles from each other. All services are offered at no cost to the client or insurance companies and are funded by donations. Each day, the Shelter provides services to approximately 150 men and 100 women. Approximately half of

the clients are overnight program participants² and half are enrolled in the recovery program.

The shelter implements an ARM framework including:

- Services on Demand (Representing many touch points for engagement and follow-up).
- Overnight shelter.
- Non-medical, social detoxification.
- Long-term recovery program (12-18 months).
- Limited health care and medical screening.
- Family program.
- AA/NA Meetings
- No limit to services.
- Peer leadership.
- Long-term post completion follow-up.
- Post-completion supported living environments.
- Life skills/Job training.

Recovery. For the purpose of this dissertation, recovery is considered to be completion of the Shelter's long-term recovery program³ that takes between 12 and 24 months. Completion includes: At least one year of sobriety (complete abstinence from alcohol and non-prescribed substances), satisfactory progress through the four stages of the

² Overnight clients are transported to the shelter from the central city each late afternoon and are given "three hot and a cot" (Two hot meals, a hot shower and a cot for the night). They are transported back to the city center after breakfast.

³ In fact, a client may have reached the DSM-IV (American Psychological Association, 2000) definition of sustained recovery at any time after one-year of abstinence.

recovery program and completion of the Recovery Dynamics⁴ 12-Step education program, the Life Skills curriculum and a three-month give-back position in the Shelter. This definition of recovery meets the sustained recovery criteria as defined by The Betty Ford Institute Consensus Panel (2007). A family program is also offered to clients, their families and others interested in the program.

Addiction Recovery Management. Per Kelly and White (2011), “Recovery management is a philosophy of organizing addiction treatment and recovery support services to enhance early pre-recovery engagement, recovery initiation, long-term recovery maintenance and the quality of personal/family life in long-term recovery” (p. 3). This is a recovery framework known as Addiction Recovery Management, and the framework will be referred to as Addiction Recovery Management or ARM throughout the remainder of this dissertation. ARM is further discussed in Chapter 2.

Social Recovery Program. A social recovery program is one that predominantly uses individuals who are in recovery as leaders and mentors. Few, if any, professional counselors, social workers, or medical staff members are used. Governance is typically provided by individuals who are senior in the program. Witbrodt et al. (2007) sum up the nature of social recovery programs by stating that the keys to social programs include the:

Opportunity for social interactions about recovery-related issues among peers in a homelike setting. This includes frequent on-site presence of alumni and community

Alcoholics Anonymous and Narcotics Anonymous members, an emphasis on

⁴ Recovery Dynamics is an alcohol and other drugs education program based on the 12-Step program of Alcoholics Anonymous. The program is owned and licensed by the Kelly Foundation. For more, see www.kellyfdn.com

building clean and sober networks and an ethic of volunteerism that incorporates program upkeep and service. (p. 948)

Social recovery programs are discussed in depth in Chapter 2.

Homelessness. For the purpose of this dissertation, a client is considered to be homeless by self-report. By accepting residence in the overnight shelter or a place in the recovery program, he/she is professing to be without a residence in which to sleep on a regular basis and to have had this status for at least 30 days in the county in which the Shelter is located.

Conclusion

Extensive research has been conducted in the field of substance abuse treatment in homeless populations, social recovery programs and Addiction Recovery Management. However, there has been no specific study of the recovery factors in a program that integrates all of these disciplines. In fact, it is noted that little research has been conducted about predictors of recovery outside of the professional treatment and self-help groups (Hser & Anglin, 2011). This dissertation analyzed differences in sobriety factors among a group of 1758 substance-abusing, homeless clients in a long-term, peer-led social recovery program that implements an ARM framework.

CHAPTER II—REVIEW OF THE LITERATURE

To build upon the literature on social recovery programs that leverage Addiction Recovery Management principles for homeless populations, this chapter of the dissertation presents a review of the subjects individually and searches for common threads among the subjects. It provides a presentation of the research literature on substance abuse/dependency in homeless populations, social recovery programs and ARM principles.

Inclusion Criteria

To ensure thorough coverage of the available literature, a search was conducted using Ebsco, Google Scholar and North Carolina State University's library search. The Ebsco portal accesses the Ebsco Host Electronic Journal Service (EJS), Digital Dissertation Abstract International and the Educational Research and Information Center (ERIC). Multiple terms were entered for search criteria including: Addiction Recovery Management, social recovery program, peer-led recovery, homeless addiction, homeless shelter recovery, drug abuse, alcohol abuse and combinations of all of the aforementioned. A plethora of resources including peer-reviewed articles, reports, books, book chapters, conference papers, literature reviews and dissertations were identified with this search. Names of some of the most prolific authors in the field were noted, and further exploration was carried out to find additional research they have authored. Personal correspondence and interviews were initiated with several of these researchers to get detailed insights to their research. Personal experience and knowledge of the researcher from years of volunteer work at the Shelter was also leveraged. Lastly, leaders in the field of AODs and mental illness in the homeless

population and Addiction Recovery Management provided bibliography lists and copies of articles.

Substance Abuse in Homeless Populations

For decades, there has been a debate as to whether homelessness causes substance abuse or substance abuse causes homelessness. There is no agreement on the most frequent direction of this relationship, but it is agreed that each exacerbates the other and one can precipitate the other (National Coalition for the Homeless, 2009; Vangeest & Johnson, 2002; Zerger, 2002). Rather than a debate of which precipitates the other, this section of the literature review is focused on the treatment of and interventions for substance abuse issues in homeless populations. The study of interventions for homeless populations is particularly important as studies have found a prevalence of alcohol abuse of 2%-86% and drug abuse of 2%-70% in various sub-populations (Zerger, 2002). The Substance Abuse and Mental Health Services Administration (2003) estimates that 38% of the homeless population is dependent on alcohol and 26% abused drugs. These rates are considerably higher than those of the general population (Stahler & Stimmel, 1995; Substance Abuse and Mental Health Services Administration [SAMHSA], 2011). AOD abuse and mental illness are considered to be among the leading reasons why homeless people are unable to break out of the destructive cycle of reoccurring homelessness.

The Treatment Episode Data Set Report (2011) from the Substance Abuse and Mental Health Services Administration (SAMSHA) provides some interesting and concerning statistics on homeless individuals who are admitted to substance abuse treatment programs. In 2009, 235,823 homeless individuals were admitted to treatment programs. This number

represented 12.6% of the admissions for which a living environment was recorded and is an increase from the 10% reported in 2000 (Substance Abuse and Mental Health Services Administration [SAMSHA], 2006). There is no indication as to whether this is due to more substance abuse issues among homeless populations or improved engagement of those populations. It is noteworthy that homeless individuals were more likely to self-refer to treatment than those who were not homeless (48% vs. 33%). Alcohol was the primary substance of abuse for homeless populations with 52% either abusing or dependent followed by opiates at 21%, cocaine at 17%, marijuana at 4% and other drugs of abuse at 6%. Alcohol was the most commonly abused AOD for treatment seeking homeless individuals of all racial/ethnic groups.

Notable racial/ethnic differences were seen in the use of cocaine among Black admissions and the use of opiates in Hispanic admissions vs. all other racial/ethnic groups. Thirty-two percent (32%) of Blacks reported cocaine as their primary drug of abuse and 36% of Hispanics reported opiates as their primary drug of abuse. Homeless admissions were more likely than other admissions to be daily users of AODs and less likely to have any days of non-use over the previous month. Blacks were overrepresented in homeless admissions vs. non-homeless admissions just as they are overrepresented in admissions among the U.S. population as a whole. Additionally, homeless admissions were more likely to be male, older and veterans compared to non-homeless admissions.

Before a discussion of specific needs and interventions for homeless populations, it is important to restate that, despite the above noted figure of 235,823 homeless individuals being admitted to treatment programs, it is suggested that services are still lacking for

substance abuse treatment overall and, particularly, for the homeless population (Tucker, Wenzel, Golinelli, Zhou, & Green, 2011). Zerger (2002) suggests that only 25% of the general population and even less of the homeless population in need of substance abuse treatment services actually receives services in professional or social recovery programs. The New York State Office of Alcoholism and Substance Abuse Services (2010) advocates for additional attention to the plight of homeless populations using alcohol and other drugs of abuse by starkly stating that “It is time to recognize that not just individuals and their current families are battered by addiction and homelessness, but generations of families will be affected and whole communities across America are now struggling from the effects of addiction and homelessness” (p. 5).

Compounding the lack of treatment available to homeless populations noted above, Maguire, Sheahan and White (2012) state that “Traditional addiction treatment programs have failed to attract, engage, retain and effectively treat the homeless population, leaving homeless persons excluded from addiction treatment or constituting a chronically recycling segment of the treatment population” (p. 1). This suggests not only that there is not enough treatment; the treatment may not be effective for homeless populations even if it is made available in traditional programs. Tucker et al. (2011) note barriers to treatment as “not having public health insurance or [having] a prior history of treatment for substance problems (Wenzel et al., 2001), as well as competing priorities such as finding food and shelter (Gelberg et al., 2004 and Gelberg et al., 1997)” (p. 1). Perhaps the most important of these needs is finding food and shelter for homeless individuals during treatment.

Westmeyer (1989 as cited in White, 2008) states very clearly that “Homelessness is a factor [in treatment] that dictates a poor prognosis until this condition can be altered” (p. 93).

Additional barriers are present with authors frequently using the terms “disaffiliation,” “distrust” (of service providers), “geographic instability” and “multiplicity of needs” to describe reasons for lack of engagement and retention of homeless individuals in substance abuse treatment programs. Additionally, Willenbring et al. (1991) suggested many years ago that the traditional, prolific medical model may not be appropriate for homeless individuals as it treats substance abuse as an acute issue rather than a chronic, reoccurring issue requiring extended and continued treatment and support. Furthermore, Zerger (2011) goes on to note the confounding factor that many homeless individuals do not acknowledge the need for help or the existence of a substance abuse problem. This lack of acknowledgement may be due to simple denial or co-occurring mental illness which blocks the recognition of substance abuse by the individual and/or service providers.

Despite these noted barriers of competing priorities, lack of financing, discrimination and other challenges of treating homeless individuals who abuse or are dependent upon substances, research has shown that effective treatment programs which lead to sustained recovery and residence can be implemented (Galanter, Dermatis, Egelko, & De Leon, 1998; Maguire et al., 2012). However, existing research has also established that different tactics must be used in the engagement and retention of homeless populations in treatment. Suzanne Zerger (2002) puts together a compelling portrait of what works in the treatment of the homeless population in her literature review, *Substance Abuse Treatment: What Works for Homeless Populations? A Review of the Literature* prepared for the Translating Research

into Practice Subcommittee of the National Health Care for the Homeless (HCH) Council and HCH Clinicians Network Research Committee. Her literature review presents extensive information on the background of substance abuse and dependency in homeless populations, effective methods for engagement and retention of homeless populations in treatment and research concerning effective program development. It also calls for more research into treating homeless populations and presents the need for social advocacy in funding and reducing barriers to treating these populations.

The body of literature on substance abuse treatment in homeless populations is quite clear on several issues: (a) treating substance abuse among homeless populations requires extensive work to engage and retain clients; (b) housing is highly correlated with successful outcomes; (c) length of treatment is highly correlated with outcome success of treatment and, (d) better outcomes are associated with having positive social networks, which are often lacking in the homeless population. Attention to these four very important areas is thought to considerably increase the effectiveness of substance abuse treatment in homeless populations and lead to sustained recovery. However, these treatment issues are often overlooked when developing and implementing programs for homeless individuals.

Recognizing importance of the above mentioned issues, Zerger (2002) suggests six strategies to increase the engagement and retention of homeless individuals in treatment: (a) assertive outreach; (b) provision of housing/practical assistance; (c) offering a safe, non-threatening environment; (d) increase motivation; (e) family-based treatment and, (f) peer leadership of treatment programs. Although the homeless population is extremely diverse, basic initiatives to address the above can be almost universally helpful in establishing

relationships that help in the initial engagement, retention and on-going stages of treatment and post-treatment support of the homeless populations. The length of time in treatment is particularly important. As Shavelson (2001) states, “If there is a single consistent finding that has come out of rehab research, it is that the longer clients can be maintained in the programs, the more likely they are to emerge clean and sober and stay that way” (p. 300). Adding to the literature on engaging and treating homeless populations in substance abuse treatment, Orwin, Garrison-Morgren, Jacobs and Sonnefeld (1999) present the following eight strategies that were developed by the National Institute on Alcohol Abuse and Alcoholism Cooperative Agreement Program:

1. Eliminate/decrease waiting period between enrollment and admission.
2. Strengthen orientation process.
3. Increase level of case manager contact.
4. Increase accessibility of program.
5. Improve program environment.
6. Increase responsiveness to specific needs (e.g. gender-specific).
7. Increase recreational and self-improvement opportunities.
8. Increase relapse prevention efforts. (p. 58)

Understanding the need to modify the engagement strategies for homeless populations, Frisk, Rakfeldt and McCormack (2006) researched the effect of assertive engagement activities on a sample of 71 homeless persons with substance abuse disorders. The study found that 59% of the individuals reached by a group of ten social workers using assertive engagement strategies and subsequently referred for treatment actually entered

treatment. The authors additionally found a high correlation between client motivation and entry to treatment, lending credence to Zerger's (2002) contention that increasing motivation contributes to engagement in treatment. It is noteworthy that, in another paper, Rowe, Fisk, Frey and Davidson (2002) report findings that those with substance use disorders are considerably more likely to express a need for help than those with other mental health disorders or co-occurring disorders. In a more aggressive outreach, Rosenblum, Nuttbrock, McQuiston, Magura and Joseph (2002) report on an engagement effort in which a fully equipped medical van was dispatched as outreach to homeless substance abusers. This engagement strategy evidenced reductions in homelessness, substance abuse and infectious diseases.

Other researchers (Velasquez, Crouch, Von Sternberg, & Grosdanis 2000); Nyamathi, Longshore, Galafi, & Leake, 2004) suggest that substance abuse programs for the homeless should include outreach to and interventions for those who are in the early stages of change (pre-contemplation and contemplation) and not quite ready to discontinue substance use. They suggest initial interviews using motivational change techniques noting that homeless populations often lack motivation in most areas of their life rather than just motivation to cease problematic substance use.

In a study looking at a more comprehensive implementation of treatment, Braucht et al. (1995) conducted a research project in which a heterogeneous sample of 323 homeless individuals received a comprehensive array of services including assertive engagement, detoxification, overnight housing and intensive counseling that were coordinated and facilitated by case a manager. Follow-up at the end of four-months of treatment and six

months after completing treatment showed dramatic improvements in average (a) levels of alcohol and drug use; (b) housing status; (c) physical and mental health; (d) employment and (e) quality of life. The authors suggest that this research and associated positive outcome evidences the effectiveness of outreach and coordination of comprehensive services by case managers.

The above literature evidences research that supports the contention that engagement, retention and treatment should be implemented differently for homeless populations than for those with traditional residence status. It shows that effective treatment is possible for homeless populations despite unique challenges and barriers to treatment. A safe environment and peer-led programs can be instrumental in the engagement, retention and treatment of homeless populations. These elements are hallmarks of social recovery programs which are discussed in detail below.

Social Recovery Programs

Social recovery models and programs are those that use peer support services as a means to design and deliver detoxification and recovery programs. Just as the name implies, this framework delivers services in a social rather than clinical environment. It uses peer rather than professional staff while emphasizing the process of “doing” and “learning” (California Dept. of Alcohol and Drug Programs, 2004) rather than the didactic approach used in many professional programs. Peers are defined as non-professionals who have experienced substance abuse and are in sustained recovery (US Department of Health and Human Services-Substance Abuse and Mental Health Services Administration [SAMSHA], 2009). The social recovery programs leverage the experience of those who have “been there,

done that.” Social recovery programs tend to deliver services in a more home-like, collegial environment than professional, clinical programs.

Social recovery programs are often looked upon as being a sobriety program for those on a budget or without insurance. To a certain extent, this is true. The cost of delivery for social recovery programs is considerably lower than for those which use clinical professionals and medical staff members (Kaskutas, 1999). Often, social substance abuse treatment programs are provided at minimal or no cost to clients. Despite the lower cost of service, investigators have found these recovery programs to be as effective as those using the medical model with professional staff members (Borkman, Kaskutas, Room, Bryan, & Barrow, 1998; Kaskutas, Ammon, & Weisner, 2003; Room, Kaskutas & Piroth, 1998). The California Department of Alcohol and Drug Programs (2004) suggests that the effectiveness of these programs is derived from their ability to assist clients with building and leveraging strong social support systems during and post treatment. Kaskutas, Greenfield, Borkman and Room (1998) differentiate social programs from medical (professional) models in six areas with the former being the characteristic of the social program and the latter the characteristic of the medical model:

1. *Physical environment*—homelike vs. institutional
2. *Staff role*—peer vs. hierarchical relationship
3. *Basis of authority*—experiential vs. professional
4. *View of recovery*—client vs. staff driven
5. *Governance*—participatory vs. nonparticipatory
6. *Community orientation*—integration vs. introduction

Social programs are most often based on the principles of the Alcoholics Anonymous 12-Step recovery program: responsibility for one's own recovery, program self-governance and the peer-inspired philosophy of "I am my brother's keeper" (Borkman, 1998; Borkman, Kaskutas, & Owen, 2007; Room et al., 1998). These programs highlight continued self-help attendance, preservation of relationships built during treatment and leverage of indigenous supports.

The social model movement was introduced in California in the 1950s and remains a powerful force in California's recovery community (California Dept. of Alcohol and Drug Programs, 2004; Room et al., 1998). The beginnings of the social recovery movement appeared as a grassroots initiative in the Alcoholics Anonymous organization which was founded some 20 years earlier. Rather than dropping off Alcoholic Anonymous members in areas with no homes or residences, AA members and sponsors banded together to set up homes for those in early recovery which were peer-led. These social recovery homes grew to include recovery facilities, halfway houses, three-quarter-way houses and Oxford houses. In the 1960s and 1970s, much legislation was passed leading to the expansion of the use of social programs in the treatment of alcohol and drug problems. Borkman et al. (1998) provide an excellent synopsis of the California legislation which led to the expansion of the social programs in stating:

California's 1965 McAteer Act enabled state funding of local clinics for treating alcoholics (Blacksher, 1990). As federal legislation urged that alcoholism be treated as a health problem (Alcoholic Rehabilitation Act of 1968) distinct from mental illness (Hughes Act of 1970) and that intoxication be decriminalized (Uniform

Alcoholism and Intoxication Treatment Act of 1971; Regier, 1979), California's Medicaid policy was written to cover reimbursement for medical complications from—but not treatment for—alcoholism (Blacksher, 1990). This discouraged medical settings from offering alcoholism services and left room for nonmedical, nonhospital services in California (Blacksher, 1990). The state legislature granted approval for police to bring alcoholics to detoxification centers, some of which were nonmedical (O'Briant, Lennard, Allen, & Ransom, 1973) and it offered financial incentives to counties that placed mentally ill people in community programs rather than state hospitals (O'Briant, Lennard, Allen, & Ransom, 1973). In 1976, the state Office of Alcohol Program Management reported that social setting detoxification was as effective as services provided in medical or hospital settings (Blacksher, 1990) and its Director, Loran Archer, was amenable to nonmedical forms for long-term residential treatment as well (Pike, 1979). (p. 656)

California continued to lessen the restriction on funding of recovery programs leaving decision making at the local level and allowing local jurisdiction to determine how to best spend federal allocations. This led to more local discretion in funding of social as well as professional programs. Although social programs required certification, the certification was not dependent on having professional staff and medical detoxification. Many jurisdictions decided that the best use of funding was the non-professional, social recovery programs thus allowing these programs to expand and thrive through the mid-1970s with a peak of 120 homes requesting certification in 1974 (Borkman et al., 1998; Room et al., 1998). However, the freedom to practice and the funding for the social recovery model began to lessen in the

1980s and 1990s. California moved to consolidate the funding for treatment of AOD abuse under state agencies. Additionally, the introduction of new drugs such as Naltrexone and others for treatment of substance abuse/dependence and a lawsuit requiring methadone to be on-demand pushed the treatment away from social models and closer to medical models. In 1992, the State of California ruled that “The first use of alcohol and drug State General Fund money is to provide Drug/Medicaid services.” This left most social recovery programs with the challenge of attracting private funding (Wright, 1995). Nevertheless, to this day, these programs continue to thrive in California and have spread throughout the United States. Social Recovery programs are now present in the southeastern United States through a loose association of halfway houses, three-quarter-way houses, Oxford houses and some social recovery programs in homeless shelters.⁵

There is some research that has been published over the last three decades concerning the effectiveness of social detoxification and treatment programs. Research leaders in this field include Lee Ann Kaskutas, PhD of the Alcohol Research Group in Emery, California and Thomasina Borkman, PhD of George Mason University, Fairfax, Virginia. This research overwhelmingly indicates that, despite the fact that social recovery programs admit clients with more severe problem, the outcomes are not significantly different from that of traditional, professionally-led, medical model programs (Borkman et al., 1998; Kaskutas, 1999; Kaskutas et al., 2003; Witbrodt et al., 2007). However, Kaskutas (2007) cautions that much of the research is open to “methodological critiques that make generalization difficult”

⁵ Although halfway houses and Oxford houses were not initially based on social recovery principles, many have matured to function as such, particularly those with no public funding.

(p. 48) and, in fact, there were no experimental studies that tracked clients longitudinally for outcome post treatment.

One of the first research studies of the social recovery model was conducted by San Diego County (San Diego County Department of Health Services, 1979; 1981; 1982; 1983 as cited in Kaskutas, 1999). The sample included 313 individuals selected from a group of 513 persons entering a social recovery program. The alcohol abuse rate for this group was considered to be “extreme” with 94% consuming a net of more than 5 ounces of alcohol per day, 75% having previously received services, and 87% having attended AA meetings in the past, and 47% were regular attenders of AA meetings. A high percentage had health, employment, legal problems and mental health issues. The sample was provided with various social model services including detoxification, a seven-day residential program, residential treatment services or non-residential neighborhood recovery center services. Each service was delivered using a social rather than professional service model. A follow-up was conducted with a response rate of 65% of the clients at 18-months post treatment. Thirty-three percent (33%) of the respondents reported being abstinent for at least six months, 21% reported being improved (no more than one problem drinking episode in the past six months or no more than five drinks on any single day) and 45% reported being unimproved. Women showed significantly better outcomes than men with 47% vs. 27% abstainers, 23% vs. 21% improved and 30% vs. 53% unimproved. Decreases in life problems were also evidenced at the 18-month follow-up. This work compared these results to another study using professional delivery and found higher rates of abstinence in the social program but also higher rates of those who did not improve. Kastukas (2002) suggests that the San Diego

study was groundbreaking in that it demonstrated that the social recovery system was effective despite the fact that it could not identify the specific services within the system that were effective.

The State of California conducted another groundbreaking study of social recovery programs in the California Drug and Alcohol Treatment Assessment (CALDATA) (Gerstein et al., 1994). This study uses a sample of 3,055 of the 150,000 individuals who had been treated in residential, social model residential, outpatient and outpatient methadone maintenance programs between October 1st, 1991 and September 30th, 1992. Sixty percent (60%) of the sample members were interviewed for follow-up approximately 15 months after treatment. The design compared before and after treatment behaviors for the sample. Before treatment, 71% reported using alcohol five or more times a week which was reduced to 50% at the follow-up interview. The authors stated that not only did the treatment have a positive effect on the use of alcohol but the treatment more than paid for itself by a reduction in crime and required hospital treatment. The authors also determined that residential treatment resulted in greater improvement than outpatient treatment and that improvement was accentuated with a longer period of stay in treatment. Within the residential programs, it was found that the social program and professionally-led program yielded similar improvements.

Further research appears in an extensive group of studies in 1995 that was published in Stahler and Stimmel's (1996) book, *The Effectiveness of Social Interventions for Homeless Substance Abusers*. This book is a compilation of ten studies that were supported by the Institute of Alcohol Abuse and Alcoholism (NIAAA) in consultation with the National Institute on Drug Abuse (NIDA). The studies are all true experimental designs with random

assignment of large sample sizes (149 to 722) and use a core set of instruments including the Addiction Severity Index (ASI), the Alcohol Dependence Scale (ADS) and the housing section of the Personal History Form (PHF). With the exception of one study, all have follow-up rates of 74% or better.

This group of studies expanded the previous research by including various geographic locations, recruitment sites, drugs of choice and populations. As a group, the studies reached five key conclusions:

1. It is essential that addiction treatment programs include focus on the tangible needs of the clients as well as the substance abuse issues.
2. Regardless of the intervention, the drop-out rate for homeless samples is likely to be high.
3. Clients in both control and experimental groups tended to show significant improvements and, with few exceptions, treatment modalities did not significantly differ in effectiveness;
4. Positive outcomes immediately after treatment seem to diminish over time.
5. Outcomes were particularly dependent on the characteristics of the sub-populations with those with less severe substance abuse issues, the more highly educated, those with less criminal activity, and those who were the least socially isolated evidencing the most positive results (Stahler & Stimmel, 1995).

Oakley and Dennis (1996) summarize that, overall, this group of research studies indicates that “traditional abstinence-based programs are not as effective with this population

[homeless] as ones that have a harm-reduction emphasis, a careful assessment of the client and his or her needs, flexibility to meet a variety of needs and motivational levels and a counseling style that allows relapse” (p. 210).

Assessing the Value of a Short-Term Residential Drug Treatment Program to Homeless Men (Lam et al., 1995), a research article from the book entitled *The Effectiveness of Social Interventions for Homeless Substance Abusers*, is most pertinent to this dissertation. The authors justify the study by stating that the abuse of cocaine and other substances is one of the leading causes of homelessness in urban men. The study used a sample of 294 homeless, cocaine-abusing men in New Haven, Connecticut and randomly assigned them either to a group that received 90-day residential treatment, shelter-based day treatment and six months of aftercare or to a control group who were given no specialized treatment. Assessments at five follow-up points resulted in a response rate of 80%. A measure of abstinence from cocaine over a 30-day period prior to the assessment at the 21-month follow-up point showed that 79% of the treatment group had been abstinent and 59% of the control group had been abstinent compared to only 11% abstinent at the baseline measure. It was found that the treatment group had actually decreased use between the 9-month and 21-month follow-up whereas the control group had increased use between these two periods. Reduction in alcohol use and poly-drug use were both significantly and dramatically lower at all check-points. It is remarkable that the control group had such dramatic improvements and implies that, perhaps, very little intervention may be needed to impact use rates. However, at the same time, this may lead the reader to be suspicious of report rates or suggest the Hawthorne effect has come into play. The experimental groups also showed improvements

in stable housing at the nine-month follow-up point. No groups showed improvement in employment status over the length of the experiment.

Another pertinent research article contained in the same book is *Factors That Interact with Treatment to Predict the Outcomes in Substance Abuse Programs for the Homeless* (Wright & Devine, 1995). The research studied the alcohol and drug use outcomes of 670 clients in the New Orleans Homeless Substance Abuses Project (NOHSAPP). Of this sample, 505 were put into a control group who received seven days detoxification while 165 were given a 21-day Therapeutic Community (TC) intervention including more extensive assessment, case management and twice-daily group meetings. A subset of the TC group was given a total of 12-months of continued intervention including GED services, job training and placement in a residence. The sample was mostly African American (82.2%), male (75%) and young (mean age =34). The survey had the goals of: “(1) a drug and alcohol-free existence, (2) residential stability, (3) economic independence and (4) a reduction in family estrangement and increase in general social functioning” (Wright & Devine, 1995, p. 170). When reviewing the main treatment effects with respect to the outcome variable of sobriety, the researchers only found marginally significant results that were limited to those clients who were treated for longer than three months. The results for residential stability and economic independence were also spotty with the only significant difference being for those who stayed long-term in the 12-month intervention, particularly women in this group. The attrition rate was very high. Despite the design being for a 12-month extended treatment, the long-term group only averaged a stay of 166 days. The results of those staying for less than the average were virtually indistinguishable from those who

only had detox or therapeutic community treatment. However, those who stayed in treatment longer than the average of 166 days consistently had significant positive outcomes. It was determined that length in treatment was the only significant outcome variable. An analysis of retention in treatment produced only marginally significant results with the exception of those who abused alcohol and evidenced a significantly longer stay in treatment. Wright and Devine (1995; J. A. Devine, personal communication, October 17th, 2012) began to wonder if these results were indicating that, in fact, the interventions did not work and, as many others have contended, treatment does not work. They decided to examine the variability within clients by assessing four outcome variables: the number of days (of the thirty prior to follow-up) that the client was substance free (used neither alcohol or drugs), the number of days not homeless, the number of days the client had worked for pay and a summary measure of “total good days” or the sum of the other outcomes. This analysis included only the 152 clients who had been in either the TC or 12-month groups and used the length of stay as a regressor. Although the significance, sign and magnitude of effects vary by outcome measure, the researchers found that gender, education, age, psychiatric morbidity, drug of choice, attendance at AA/NA meetings and prior treatment histories were predictors of outcome. This suggests that basic individual attributes significantly interact with treatment to determine outcome.

Stahler, Shipley, Bartelt, DuCette and Shandler (1995) also conducted a study similar to the one above. Seeing no difference in the three treatment protocols of an initial experiment, they introduced demographic variables (e.g., age, education, marital status), lifetime variables (e.g., lifetime alcohol use, lifetime treatment episodes), and other

individual differences to measure variations in success of individuals. The demographic variables were all significant but the amount of variance accounted for (adjusted R^2) was moderately low at 8%-21% suggesting caution in the interpretation of the predictability. The only significant lifetime variable was cocaine use with those having longer histories and more detoxification stays less likely to be abstinent.

Finally, an excellent study was authored by Witbrodt et al. (2007) entitled *Day Hospital and Residential Addiction Treatment: Randomized and Nonrandomized Managed Care Clients*. The researchers tracked a sample of male and female clients belonging to a managed care plan who were randomized to either a day hospital ($n = 154$) or community residential treatment⁶ ($n = 139$). Additionally, due to the possible bias of naturalistic studies, the study also measured clients who had self-selected to day hospital ($n = 321$) versus a group that had been directed to a residential treatment setting ($n = 82$) due to being high-risk. The researchers hypothesized that abstinence rates would be higher for those randomized to the community residential program than those randomized to the day hospital at 6 and 12 month follow-ups. The study also analyzed whether the clients who self-selected into the day treatment hospital had different treatment outcomes than those who were randomly assigned to day treatment to determine if treatment preference affected outcomes. Thirty-day-past-sobriety rates for all groups at the 6-month and 12-month follow up were all approximately the same (77%-83%) with the exception of the directed community residence clients who averaged 59%. In summary, the analysis found that there were no significant differences in the past-30-day use rates. Even when the non-respondents were added to the

⁶ Community Residential Treatments adhere to all the hallmarks of social programs outlined in the definition section of the introduction of this dissertation.

analysis as not being abstinent, the difference was not significant. No main effects were found for gender or ethnicity, and no interactions were found for group vs. time in treatment. However, time in treatment and participation in AA/NA programs were predictors of abstinence.

The literature reviewed for social recovery programs indicated little to no difference in the effectiveness of social detox and recovery programs compared to professionally-led programs. As noted in much of the research, it is less expensive to provide social recovery programs than professionally-led programs and this often leads to clients being able to have more extended treatment in the social programs. Some association has been shown between the length of time homeless, the length of time using AODs and the quantity and quality of social supports with the ability to complete treatment. Beyond these, there is little consistency found in the research of demographic and life factors that affect treatment. It is thought that this may be attributed to the heterogeneity of homeless populations (Zerger, 2002).

Addiction Recovery Management

The most commonly used treatment protocol for substance abuse disorders in the United States is detoxification followed by a short-term inpatient and/or intensive outpatient acute treatment protocol (Kelly & White, 2011; White, Boyle, & Loveland, 2008). More recently, additional attention has been focused on treatment with an ARM framework that is premised on addiction being a chronic disorder, which requires long-term treatment and continuity of care (Kelly & White, 2011; White, 2008). Proponents of ARM suggest that the current, short-term treatments have helped many people but, if it were truly believed that

substance abuse is a chronic disorder, a move toward a long-term treatment and continuing care would be implemented. The recent enactment of the Mental Health Parity Act (“Obama Administration,” 2010) that treats mental health and substance abuse issues the same as any other health issues may provide the funding and impetus to extend the use of chronic care models to substance abuse disorders. In addition to professional programs, some social recovery programs are introducing principles of ARM.

Given that ARM leaders as well as other leaders in the substance abuse field now regard substance abuse as a chronic disease (Center for Substance Abuse Treatment ([SAMHSA], 2006; Kelly & White, 2011; Urschel, 2009), changes are suggested for the delivery of services. Viewing substance abuse as a chronic disorder requires a realignment of the treatment process and outcome expectations so that they resemble those of other chronic diseases such as diabetes or hypertension. Leaders suggest that acute, single, or episodic treatments can no longer be expected to sustain long-term recovery. The ARM framework recommends long-term treatment in addition to monitoring, leveraging and coordinating various treatment providers through the use of case management.

Kelly and White (2011) succinctly define recovery management as “a philosophy of organizing treatment and recovery supports to enhance early engagement, recovery initiation and maintenance and the quality of personal/family life in the long-term” (p. 1). They elaborate on the comprehensiveness of the recovery-oriented paradigm in stating that these “are networks of indigenous and professional supports designed to initiate, sustain and enhance the quality of long-term addiction recovery for individuals and families and to create value and policies in the larger cultural and policy environment that are supportive of these

recovery processes” (p. 2). It is further stated that the system is not a specific agency but a macro-level delivery organization based in the cultural and community environment where the recovery takes place. ARM requires not only a paradigm shift in the delivery systems but also a shift in the thinking of the client. The delivery system must be adapted to keep in contact with the client over an extended period of time and offer regular “check-ups” just as it would for any other chronic disease. Likewise, the client must recognize the chronic disease nature of substance abuse disorders and be willing to continuously monitor symptoms and take action required to remain in recovery. ARM professionals recognize that there will be short-term, acute episodes of treatment using the standard short-term treatment protocols but espouses integrating these with a long-term process of sustained recovery.

A key difference between the short-term, acute treatment framework and the ARM framework is the length of treatment or observation. While the shorter-term residential or outpatient treatments essentially graduate participants after treatment with a simple suggestion of engaging in follow-up care, those who employ ARM actively engage with other service deliverers and indigenous sources of support in order to facilitate continued treatment. As seen in Dennis and Scott’s (2012) research article, *Four-year Outcomes from the Early Re-Intervention (ERI) Experiment using Recovery Management Checkups (RMCs)* (2012), engaging in regularly scheduled check-ups with a linkage manger considerably speeds the initiation of re-engagement to active treatment and leads to more positive outcomes. ARM also leverages the use of indigenous community supports such as self-help groups, links to on-going peer support, use of group homes and support of family and significant others. Simply put, the ARM framework builds on the existing use of short-term

recovery processes by recognizing substance abuse as a chronic disorder requiring regular check-ups and maintenance.

ARM is not an exact science and can often be viewed as lacking clarity or a step by step prescription of implementation. It can use a single modality of treatment or more commonly can leverage an eclectic combination of existing and emerging practices to promote long-term recovery (Hester & Miller, 2003). The various frameworks of treatment have been addressed in the literature (Kelly & White, 2011; SAMHSA, 2006; Urschel, 2009), but the elements within the frameworks are variable. Although this may suggest a lack of clarity, this is necessary in order to individualize treatment based on diagnosis and need. In fact, the lack of clarity and the informed eclecticism within ARM can be viewed as a benefit allowing individualized treatment based on need if the treatment is carefully planned and tailored to the needs of the client rather than the convenience of the deliverer. As stated earlier, it has so far proved impossible to construct a framework with constant internal components that consistently works with all individuals and results in sustained recovery.

The framework of ARM is considerably more comprehensive than many other treatment frameworks. ARM is comprehensive in that it attempts to integrate all the elements for a lifetime of sobriety and minimize the need for acute treatment by providing early intervention and continuation of care. It regards substance abuse disorders as a lifelong disease and provides services and multiple linkages for the chronic disease of addiction, dual-diagnosis as well as related personal and social issues. Scott and Dennis (2011) describe the comprehensive nature of ARM by using the acronym “TALER” to outline the elements of

the framework: (a) tracking, (b) assessing, (c) linking, (d) engaging and (d) retaining.

Although it is comprehensive, Kelly and White (2011) note that recovery management is only one element being incorporated into a larger systems transformation process. As lessons are learned from implementations of ARM frameworks, it is likely to become more comprehensive and more a part of the chronic disease treatment model. This new model of chronic care will move beyond simple ARM and move to an even more comprehensive Recovery Oriented System of Care as part of the “systems transformation” called for by Scott and Dennis (2011). This system of care will rely less on discrete linkages and more on a fully integrated, comprehensive care delivery system including primary physicians, counseling, treatment centers and indigenous and social supports.

There is extensive debate as to whether substance abuse treatment, regardless of the overarching framework, is useful in promoting recovery. Goldberg (2006) states “Much of the research on drug abuse treatment effectiveness is inconclusive; furthermore, researchers do not agree on what the best way is to measure effectiveness” (p. 439). Research by Ettner et al. (2006) “estimate[s] that not only do people in substance abuse benefit, but the tax payers also benefit” and estimate “that about seven dollars is saved for every dollar spent on treatment” (p. 15). Additionally, “Individuals in treatment are less likely to engage in criminal activity and they are more likely to be employed” (p. 419). However, others suggest that treatment, specifically short-term treatment, does not cure substance abuse or promote long-term sobriety and does not recognize the chronic, relapsing nature of substance abuse (Kelly & White, 2011; United Nations Office on Drugs and Crime, 2003).

Despite the extensive debate over the effectiveness of substance abuse treatment and modalities of such treatment, ARM provides a useful framework for the delivery of services that can be constructed with those services most appropriate for the client. The fact that ARM recommends regular recovery management checkpoints is useful for promoting quicker re-intervention in case of any issue that arises (Dennis & Scott, 2012). The addiction recovery framework is useful in helping to define an overall, long-term structure for the pursuit of recovery. ARM is also very useful in that it leverages supports of groups beyond the traditional professional support groups in the more traditional short-term, acute model. It strongly recommends those in recovery use an extended network of supports such as a sober living house, mutual support groups, peer-led rehabilitation and detoxification, family and friends as well as professional supports. This framework is very easy to customize as far as the services it provides, linkages to other services and supports and its ability to introduce theories and modalities that are most useful to the individual client.

Substance abuse has been deemed as the “Nation’s Number One Health Problem” (Schneider Institute for Health Policy, 2001). As such, extensive research and theory development has been funded and conducted. Research is continuously being conducted to find the most effective solutions in terms of outcome and cost for substance abuse disorders. This research builds on and integrates the theories and the lessons learned from previous quantitative and qualitative research. The framework of ARM leverages this research and clinical experience to continuously improve. As a framework, it takes the most effective elements of various theories and integrates them in order to deliver the most effective

treatment. Moos (2011) states that the social processes integrated into ARM emanate from the following theories:

1. Social Control Theory, which focuses on the provision of support, goal direction and monitoring.
2. Social Learning Theory with its emphasis on abstinence-oriented norms and models.
3. Stress and Coping Theory, which highlights the importance of self-efficacy and coping skills.
4. Behavioral Economics and Behavioral Choice Theory and its focus on role engagement in rewarding activities other than substance use. (p. 45)

Moos and Moos (2007) elaborate on each of the theories and demonstrate how the interventions within the theories can be integrated into the ARM framework to deliver a long-term, holistic recovery plan. As additional research evidence builds, ARM will have the ability to incorporate the most up-to-date, effective treatment interventions and theories as components to deliver more effective services.

Multiculturalism and diversity concepts are integrated into ARM. The framework can be individualized to embrace the client's culture. SAMSHA (2006) advises that:

Culture is important in substance abuse treatment because the client's experiences of culture precede and influence their clinical experience. Treatment setting, coping styles, social supports, stigma attached to substance use disorders, even whether an individual seeks help—all are influenced by a client's cultureTreating a client from outside the prevailing United States culture [dominant culture] involves

understanding the client's culture and can entail mediating among the U.S. culture, treatment culture and the client's culture. (p. 179)

In addition, White and Sanders (2004) suggest that ARM is superior to acute care models in treating AODs in communities of color. They state the communities of color have been ill served by treating substance abuse disorders with episodic, brief interventions. They state that ARM adds the benefit of:

. . . a broadened perspective on the etiological roots of AOD problems (including historical/cultural trauma); a focus on building vibrant cultures of recovery within which individual recoveries can be anchored and nourished; a proactive, hope-based approach to recovery engagement; the inclusion of indigenous healers and institutions with the RM team; an expanded menu of recovery support services; culturally grounded catalytic metaphors and rituals; and a culturally-nuanced approach to research and evaluation. (p. 365)

Because substance abuse treatment can be quite expensive, the ability to find treatment outside of the traditional, professional led treatment paradigm, as in an ARM framework recognizes the challenge of those from a culturally disempowered group who can not afford insurance or self-pay. The individualization of this framework lends it to broader accessibility for those in need of treatment.

The framework of ARM makes great strides in arranging the breadth of available knowledge, research, practice and service delivery into a comprehensive, integrated system. It seeks to have the practitioner and the student recognize substance abuse as a chronic disease and treated it as such. This framework is only the beginning of what Kelly and White

(2011) call a “systems transformation” (p. 1). Kelly and White (2011) provide examples of implementations that have worked but note that much work is needed to implement the framework throughout the substance abuse treatment delivery system. Continued research on the merits of ARM and its integration into existing practice and education programs will likely transform the structure of substance abuse delivery systems and yield improved outcomes and fiscal savings.

Conclusion

Due to the lack of previous research literature on recovery factors of homeless populations in shelter programs that leverage ARM principles, previous studies of the individual subjects of substance abuse in homeless populations, social recovery programs, and ARM are presented in this literature review. Gaps in the literature are identified in this chapter. Evidence of many related concepts suggests the merging of them into an integrated delivery program would provide benefit to homeless populations. Some of the concepts that appeared to be most prevalent throughout the literature are as follows.

1. The need for engagement and retention of clients in substance abuse treatment while overcoming barriers (Stahler & Stimmel, 1995; Zerger, 2002).
2. The need to view substance abuse as a chronic rather than an acute disorder (Kelly & White, 2011; Willenbring et al., 1991 as cited in Zerger, 2002).
3. The importance of providing housing along with an appropriate recovery program (Milby et al., 1996; Stahler & Stimmel, 1995).
4. The need for a coordinated, interagency approach to the delivery of services (Higgins & Silverman, 1999; Kelly & White, 2011).

5. The need to integrate to social and indigenous supports (Kelly & White, 2011; Zerger, 2002).

Much of the literature overlaps and suggests the implementation of many similar interventions. A review of the literature as well analysis of practice suggests that it is possible to provide effective treatment to homeless populations despite the additional challenges and barriers to treatment. This literature review leads one to believe that a modification of the delivery of substance abuse treatment for homeless populations is needed and, in fact, the ARM framework leads one to ponder a new paradigm for how substance abuse is viewed for all populations.

CHAPTER III—METHOD

The primary purpose of this study was to determine the differences in demographic and life factors for those who completed the sobriety program at the Shelter, a long-term, residential, social recovery program for homeless citizens which implements ARM principles. It has been calculated that 70% of the individuals completing this program remain sober at the one-year follow-up after completion. Completion of the program indicates Recovery per the definition of The Betty Ford Institute Consensus Panel (The Betty Ford Institute Consensus Panel, 2007). This chapter of the dissertation outlines the methods used to analyze the data, test the hypotheses and develop a prediction model for program completion.

Research Design

The research for this dissertation is a two-group (completion, non-completion of sobriety program), ex post facto design using information gathered upon entry to the recovery program at the Shelter as independent variables. Ex post facto design is used in cases when the participants cannot be randomly assigned to groups and the independent variable(s) cannot be manipulated (such as sex or race) or has not been manipulated (perhaps due to ethical constraints or other reasons) by the researcher. A true cause and effect relationship can not be determined using an ex post facto design (Fraenkel & Wallen, 2008; Heppner, Wampold, & Kivlighan, 2008). Rather, this research design can highlight pertinent information that may be of interest and merit further experimental quantitative or qualitative research. In the case of this research, the independent variables are either demographic (gender, age and race) and/or were established before the study was undertaken (drug of

choice, veteran status, age of first use, years of use and number of admissions to the Shelter). Likewise, the dependent variable, completion of the recovery program, was determined prior to the design of the research. A list of the variables with valid data values is in Appendix A. Data of all Shelter recovery program admissions from the year 2008 to 2010 were used in this study. During this period, there were 1758 admissions, 1084 men and 674 women. The data represent 1394 individual clients.⁷ This is the most recent data for those clients who have completed the program. All cases represent clients who have either completed the program in compliance or left the program before completion. Except for the dependent variable, all data were collected by client self-report at the time of admission to the recovery program at the Shelter.

Profile of Participants/Program

Participants in this study all came to the Shelter as self-reported homeless citizens of a one-county area in the southeastern United States. The route of admission can be from the overnight shelter, via the social detoxification unit or, on rare occasion, directly into the program by management referral. If a client in another portion of the program such as the overnight shelter has a substance abuse issue and is interested in the long-term recovery program, that client indicates that he/she would like to make the commitment and he/she is either moved directly to the program or put on a waiting list. The time spent on the waiting list is rarely longer than 10 days. The Shelter's recovery program is divided into four stages with increased responsibilities as well as increased privileges as the client progresses through the program. For those who complete the program, the average stay in Stage One is 39 days,

⁷ There are cases of clients who entered the program, did not complete and returned on a subsequent admission.

Stage Two is 25 Days, Stage Three is 188 days and Stage Four is 159 days. During Stage One and Two, a client is housed in the community shelter with approximately 80 other program and overnight clients, and he/she is given an assigned, guaranteed bed. The client starts Stage Three in a dormitory style room housing eight clients and progresses to a room housing four clients. Stage Four housing is in a two-person room with an attached bathroom.

Attrition in the program is high with the following rates of leaving: Stage One: 49.4% ($n = 870$), Stage Two: 11.87% ($n = 209$), Stage Three: 23.74% ($n = 414$) and Stage Four: 6.19% ($n = 109$) (based on those who started the program). The overall completion (transition)⁸ rate is 8.57%. A noticeable difference by gender appears in the dropout rate in Stage Three (Men-21.38%, Women-27.68%).⁹ Although out of the scope of the current research and not included in the data, the Shelter states that 70% of those completing the program are still sober at the one-year post-completion follow-up.

Instrumentation

No published instruments were used for this study. Data elements of gender, age, race, drug of choice, veteran status and age of first use were taken from client self-reports. Gender, age, race and veteran status could be, but were not necessarily, corroborated through public records or presentation of official identification. Age of first use was considered to be static from admission to admission. Although not frequent, drug of choice may have changed from admission to admission. Years of use was calculated by subtracting the age of first use from the age of the client at admission. Whether the client was a new client or

⁸ The term “transition” is use rather than “graduation.” Graduation is considered to imply the end of a course of work. The work of recovery is considered to never be complete.

⁹ The term “noticeable” is used rather than “significant” this as data analysis is outside the scope this dissertation.

returning client was determined from a review of previous records. Completion in good standing was determined by the Shelter staff. Age, age of first use and length of use are continuous variables. In order to determine if group differences exist, these variables have been divided into categories. The categories were determined by the researcher based on knowledge of previous research and a review of the data to determine if any logical breaks in the data existed.

Procedure

Data collection. Permission to use the data was obtained from the Shelter. An exemption was requested from the federal regulations that govern the use of human subjects in research from the Institutional Review Boards (IRB) of North Carolina State University. The exemption was requested and approved under Clause 4 of 45CFR 46.101(b):

(4) Research, involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available, or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects” (Code of Federal Regulations Title 45 – Part 46 – Protection of Human Subjects, 2009).

Existing data were used in the study. While not publically available, the data have been “recorded by the investigator in such a manner that the subjects cannot be identified, directly or through identifiers linked to the subjects.”

The original data was collected during the admission process to the Shelter recovery program in the years 2008 to 2010. At the time of admission, the client had typically been

abstinent from AODs for approximately one week or longer. The data was recorded using a standardized Psychosocial History form. The data is then accumulated in a Microsoft Excel spreadsheet. The Excel spreadsheet was used for recording and reporting key measurements. Any identifying information was replaced with a sequential numeric code. The data scales are listed in Appendix A.

Data analysis. Hypotheses were tested using logistic regression¹⁰ at a significance level of $p < .05$. The use of logistic regression is optimal when analyzing a dichotomous independent variable with a combination of nominal, ordinal and/or continuous variables. Additionally, using logistic regression is preferred over Ordinary Least Squares (OLS) regression as OLS regression presents assumptions that are often very difficult to match and can produce impossible predicted probabilities when using one or more continuous independent variables (Osborne, 2012). An advantage of the logistic regression over a simple Chi-Square measure of group differences is that it allows the effect of a single independent variable to be measured with all other variables being held constant. Some independent variables in the logistic regression were transformed. The nominal/ordinal variables were dummy coded for entry into the regression equation, and continuous variables were left in the original form other than when their group differences were assessed. The results of the logistic regression are presented as odds ratios.

The final regression model was generated using forced entry of variables in the logistic regression model. Goodness of fit was tested using the Hosmer-Lemeshow test. The pseudo R^2 was estimated using Cox and Snell R Square and Nagelkerke's R Square.

¹⁰ For a simple explanation of logistical regression, odds ratios and the calculations behind each, see Osborne (2012).

Description of data elements/scales/categorization. The response options for data are listed in Appendix A. A description of the data elements and categorization for group-wise analysis follows:

1. Gender: Self-reported birth gender of the client designated as Male or Female.
2. Race: Self-reported race of the client. For the purpose of group-wise analysis, the data was put into three nominal groups: Caucasian, African-American and Others.
3. Age: Self-reported age of client at date of admission to the program. The data were preserved as a continuous variable while analyzing group differences of other variables and in developing a regression model. The data were categorized into four ordinal groups to analyze group differences: 18-25, 26-39, 40-49 and over 49 years of age.
4. Veteran Status: Self-reported response of “Yes” or “No” to the question of whether the client has ever served in the US Armed Services.
5. Drug of Choice: Self-reported primary drug of abuse for the client. For the purpose of group-wise analysis, these data were put into five nominal groups: Alcohol, Crack, Alcohol and Crack, Poly-Drug and Other. Those reporting “Other” were not included in the analysis to avoid the complete separation of the predictors. Details behind this decision are included in the Assumptions and Confirmation section.
6. Age of First Use: The response in years to the question of when the client used an AOD for the first time. For group-wise analysis, the data were

grouped into these ordinal groups: under 11 years old, 11 to 17 years old, 18 to 20 years old and over 20 years old. It must be noted that the construct of First Use is not well defined and may be misconstrued by the client. While some may construe this question to ask, for instance, when he/she had his/her first sip of alcohol, others may construe this to ask when he/she first became intoxicated, or still others may construe this to ask when AOD use first became problematic. For this reason, this variable was not used in group-wise analysis of other variables or the prediction model.

7. Length of Use: The calculated number of years between the client's first use of an AOD and his/her current age. The data were used as a continuous variable while analyzing group differences of other variables and in developing a regression model. The data were categorized into four ordinal groups to analyze group differences: 1-10, 11-20, 21-30 and >30 years. As this variable fails the assumption of independence (see the section on Assumptions and Confirmations) it is not used in group-wise analysis of other variables or the prediction model.
8. New/Return Client: This variable indicates whether the client has previously been admitted to the recovery program at the Shelter.
9. Completion: This is the dependent variable that is a "Yes" or "No" as to whether the client completed the sobriety program at the shelter.

Hypotheses

The following questions were investigated using the listed hypotheses with regard to completing the recovery program at the Shelter:

1. Is there is a significant gender group difference between those who complete the program and those who do not? It is predicted that the completion rate of men is higher than that of women.

H_0 : Completion rate is equal regardless of the gender of the client.

H_A : There are group differences in completion rate based on the gender of the client.

2. Is there is a significant racial group difference between those who complete the program and those who do not? It is predicted that the completion rate of Caucasians is higher than that of other races.

H_0 : Completion rate is equal regardless of race of the client.

H_A : There are group differences in completion rate based on the race of the client.

3. Is there a significant age group difference between those who complete the program and those who do not? It is predicted that there is no difference in completion rates based on age.

H_0 : Completion rate is equal regardless of the age of the client.

H_A : There are differences in completion rate based on the age of the client.

4. Is there a significant veteran status group difference between those who complete the program and those who do not? It is predicted that the completion rate for veterans is higher than that of non-veterans.
 H_0 : Completion rate is equal for veterans and non-veterans.
 H_A : There are group differences in completion rate between veterans and non-veterans.
5. Is there a significant drug of choice group difference between those who complete the program and those who do not? It is predicted that there is a difference in completion rate based on drug of choice.
 H_0 : Completion rate is equal regardless of drug of choice of the client.
 H_A : There are group differences in completion rate based on the drug of choice of the client.
6. Is there a significant age of first use difference between those who complete the program and those who do not? It is predicted that the completion rate for those whose first use is at an older age is higher than those clients whose first use is at a younger age.
 H_0 : Completion rate is equal regardless of age of first AOD use of the client.
 H_A : There are group differences in completion rate based on the first AOD use of the client.
7. Is there a significant length of use difference between those who complete the program and those who do not? It is predicted that the completion rate for

those who have used substances for a shorter period of time is higher than those clients who have used for longer.

H₀: Completion rate is equal regardless of length of use of the client.

H_A: There are group differences in completion rate based on the length of use of the client.

8. Is there a significant difference between those who have had multiple treatments at the Shelter and those who have not? It is that the completion rate for those clients who have entered the program more than once is higher than those who are on their first entrance.

H₀: Completion rate is equal regardless of whether the client is a new or return client.

H_A: There are group differences in completion rate based whether the client is a new or return client.

Conclusion

Ex post facto data collected at the Shelter's recovery program was analyzed using logistic regression. The eight hypotheses were tested and interactions analyzed with results being presented in odds ratios and significant interactions presented in graphical format.

Two prediction models were generated using logistic regression.

CHAPTER IV—RESULTS

Introduction

The purpose of this study was to determine if there were demographic and substance use differences between those who completed a long-term, peer-led recovery program for homeless individuals that uses an ARM framework and those who left the program before completion. Using data gathered upon entry to the program, the study assessed eight hypotheses and generated two prediction models. The sample consisted of 1758 clients who entered the Shelter's program between the years of 2008 and 2010. The clients resided in a separate men's shelter ($n = 1084$) and women's shelter ($n = 674$).

The analysis in this chapter provides results of the hypotheses testing and model generation as well as testing of the assumptions and residual output of the logistic regression. Some issues with the quality of or ability to use some data cases or variables were found and are discussed. Some data cleaning was performed and is listed in Appendix B. Data analysis was conducted with IBM SPSS Statistics, Version 21, Release 21.0.0.0.

Assumptions

A valid logistic regression model must meet certain assumptions in order to draw valid conclusions (Field, 2009; Fraenkel & Wallen, 2008). The following sections present an analysis of the assumptions for the predictor model and group-wise comparisons performed in the logistic regression model.

Linearity. Any continuous variable used in logistic regression must meet the assumption that there is a linear relationship between it and the natural log of the dependent variable. This assumption was assessed by testing whether the interaction of the variable and

its log transformation was significant for the outcome variable (Field, 2009). The standardized continuous variables of Age, Age of First Use and Length of Use were analyzed. A new variable of the log transformation of each of the aforementioned variables was added to the data. Table 1 shows the results of the logistic regression of the interaction between each continuous variable and its log. As the interactions were not significant, the assumption of linearity is met.

Table 1
Test of Linearity for Continuous Variables

	<i>B</i>	<i>SE</i>	<i>df</i>	<i>p</i>
Age by Log of Age	-.08	.09	1	.348
Age of 1 st Use by Log of Age of 1st Use	-.07	.07	1	.287
Length of Use by Log of Length of Use	.04	.05	1	.424

Independence of errors. Length of Use was the only variable used that did not exhibit independence of errors; all other variables did. As this is a variable calculated using other variables in the data set, it could not meet the assumption of independence of errors. For this and reasons of data integrity listed later, it was removed from the analysis of group-wise differences for other variables and was not included in the prediction models.

Multicollinearity. Logistic regression can be affected by the collinearity of continuous variables that may bias outcomes (Field, 2009). As could be expected, there was a high collinearity among the variables of Age, Age of First Use and Length of Use because Age of First Use was a calculated variable. When Length of Use was removed, multicollinearity was acceptable. Hence, the Length of First Use was transformed into a

group variable when assessing group differences. It was removed when generating the logistic regression prediction models.

Incomplete information from the predictors. The goodness of fit for a logistic regression model is improved if the data include at least one example of each combination of the predictor variables. Due to the number of predictor variables and categories in this data set, some combinations were not represented. In order to determine if this presented a problem, Field (2009) recommends looking at the standard errors for abnormally large values. After removal of the Age of First Use variable, no large errors were seen which suggested that the lack of information did not present a problem in the logistic regression.

Complete separation. A logistical regression model can be adversely affected or, in fact, invalidated when one or a combination of variables can perfectly predict the outcome (Field, 2009). As no clients in the Drug Group of “Other” (Heroin, Other Opiate, Other Stimulant and Marijuana) completed the sobriety program, the outcome could be perfectly predicted by this independent variable. Due to this issue, the Drug Group of “Other” was removed and replaced with a null value during the hypothesis testing of other variables and during the generation of the logistic regression prediction models ($n = 38$).

Skew/Kurtosis. Table 14 located in Appendix C provides the skew and kurtosis for the continuous variables of Age, Age of First Use and Length of Use for reference purposes only. Logistic regression does not require that the data have a normal distribution. Although not required, efforts were made to normalize the variable of Age of First Use via transformation. Even with use of Box-Cox transformation, it was not possible to bring the kurtosis within the range of +/- 1.

Residuals

Following is a summary of the Residual Statistics saved during data analysis:

1. Predicted Values: The predicted completion values for the sample ranged between .01 and .44. All samples were predicted to be in the Non-Completion group. More is discussed in relation to the predicted values in the Prediction Model section below.
2. Cooks Values: Values ranged from .00 to .31. Cooks values less than 1 indicated that there were no influential cases which had an inordinate effect on the model (Field, 2009).
3. Leverage Values: Values ranged between .00 and .05 with mean of .01 which was very close to the expected value of: $\text{Number of predictors} + 1 / \text{Sample size}$ ($9/1720$) or .00532.
4. Standardized Residuals: Values of cases for those who did not complete the program ranged between -.89520 and -.10583 which was well within the ± 2 *SD* that was expected. No values were of concern. Values for the cases of those who completed the program ranged from 1.47 to 6.08. Although seemingly high, such values were expected and were not of concern with such a small percentage of cases in the completion category (D. Nichols, SPSS Master Statistician, personal communication, December 24th, 2012).
5. Deviance and DFBeta values: All values were below the acceptable threshold of 1.0.

Construct Validity

As the use of ex post facto data did not allow the researcher to define the constructs in question, attention had to be paid to data that appeared to be abnormal or in error. During data analysis, the variable of Age of First Use had values of less than five years of age which caused concern. An interview with the lead collector of data indicated that the construct did not have a high degree of validity. Where some respondents may have considered first use to be the first sip of alcohol provided by a parent, others may have considered this to be the first use of drugs or alcohol to excess or even the age at which AODs first became problematic. The data collector stated that clients had leeway to answer this question as they saw fit. Additionally, the validity of this self-report data may have suffered from the inability of the respondent to recall the first use (particularly when the use began before adolescence). Due to concerns of the validity of the data, it was decided that this variable would not be used when testing the hypotheses of other variables or for the generation of the prediction models. As Length of Use was a variable derived from the Age of First Use, it was decided to also remove this variable when testing the hypotheses of other variables and for the generation of the prediction models. The effect of the removal of these variables was mitigated by the fact that they were both found to not be significant.

Descriptive Statistics

Appendix C contains the descriptive statistics of the variables presented in the hypothesis testing and prediction model. Table 13 contains categorical variables presented with frequency, valid percent in each category, number who completed the program and the percent who completed the program. Table 14 contains continuous variables which are

presented with the statistics of minimum, maximum, mean, standard deviation, skewness and kurtosis. The continuous variables are presented in both tables as they are placed into categories for hypothesis testing.

Hypothesis Testing

Hypothesis testing was conducted using the Binary Logistic Regression option of SPSS Statistics. When possible, continuous variables were preserved to maintain granularity. These continuous variables were divided into categories during their individual hypothesis testing. Table 2 shows the output for testing of the hypothesis on Gender, Race, Age, Veteran Status, Drug of Choice and New/Return Client.

Table 2
Variables in the Equation

Variable (Base)	<i>B</i>	<i>SE</i>	Wald	<i>df</i>	<i>p</i>	Exp(<i>B</i>)	95% C.I. for Exp(<i>B</i>)	
							Lower	Upper
Gender (Female)	0.64	0.21	8.92	1	.003	1.89	1.24	2.87
Veteran (Non-Vet)	0.39	0.26	2.28	1	.131	1.47	0.89	2.42
New/Ret (New)	-0.07	0.21	.12	1	.728	0.93	0.62	1.39
Race group (AA)			8.97	2	.011			
Race group other	0.51	0.56	.85	1	.356	1.67	0.56	4.95
Race group Cauc	0.60	0.20	8.94	1	.003	1.82	1.23	2.71
DOC group (crack)			3.64	3	.303			
DOC group alc+cr	0.28	0.46	.39	1	.535	1.33	0.54	3.26
DOC group alcohol	0.03	0.49	.00	1	.955	1.03	0.40	2.67
DOC group poly	0.47	0.45	1.08	1	.300	1.59	0.66	3.84
Age	0.05	0.01	27.06	1	.000	1.05	1.03	1.07
Constant	-5.43	0.60	82.45	1	.000	0.00		

Note. Exp(*B*) = odds ratio, C.I. = confidence interval. Variable(s) entered on step 1: Gender, Veteran, NewRet, RaceGrp, DOCGroup, Age. Value in parentheses represents base value or the zero value of the dummy variable.

Hypothesis 1-Gender. Is there is a significant gender group difference between those who complete the program and those who do not? It was hypothesized that the completion rate of men is higher than that of women.

H₀: Completion rate is equal regardless of the gender of the client.

H_A: There are group differences in completion rate based on the gender of the client.

Appendix C, Table 13 indicates that the sample consisted of 61.66% male clients (n = 1084) and 38.8% female clients (n = 674). The completion rate was 10.79% for male clients (n = 117) and 5.04% for female clients (n = 34). The data in Table 2 indicates the null hypothesis that completion rate is equal regardless of the gender of the client was rejected ($B = 0.64$, $p = .003$) and suggests that there was a significant difference in the completion rate of male and female clients. The odds ratio ($\text{Exp}(B) = 1.89$, 95% CIs = [1.24, 2.87]) indicated that a male client had 1.889 times the odds of completing the program of a female client. This supported the gender outcome hypothesis that stated there would be a difference in outcome based on gender and the outcome prediction that the completion rate of men was higher than that of women.

Hypothesis 2-Race. Is there is a significant racial group difference between those who complete the program and those who do not? It was predicted that the completion rate of Caucasians would be higher than that of other races.

H₀: Completion rate is equal regardless of race of the client.

H_A: There are group differences in completion rate based on the race of the client.

The racial make up of the sample and completion rate by racial group is listed in Table 3. For purpose of group comparison, racial groups that represented less than 2% of the

total sample each were consolidated in a group of “Other” and not analyzed individually. They are listed in Table 3 for reference.

Table 3
Descriptive Statistics of Race Variable

Variable	Value	Frequency	Valid Percent	Number Completing	Completion Percent
Race	AA	705	40.10	48	6.81
	Asian	2	.11	0	.00
	Bi-racial	2	.11	0	.00
	Caucasian	1001	56.94	99	9.89
	Hispanic	35	1.99	2	5.71
	Native American	13	.74	2	15.38
	Total	1758	100.00	151	8.59
Race Group	AA	657	37.37	48	7.31
	Caucasian	902	51.31	99	10.98
	Other	48	2.73	4	8.33
	Total	1758	100.00	151	8.59

The data in Table 4 indicated that the null hypothesis that completion rate would be equal regardless of the race of the client is rejected and suggests that there was a significant difference in rate of completion of the various race groups. There was a significant difference between the completion rate of Caucasian and African-American clients with Caucasians having 1.824 times the odds of completing than do African-Americans. There was no other significant relationships based on race and additional analysis did not suggest any interaction between Race and other of the other variables. This result concurred with the outcome prediction that Caucasians would have a higher rate of completion than African American clients.

Table 4 lists the B value and p for each race output combination. The odds ratios of $\text{Exp}(B)$ and the 95% confidence intervals are included for significant outcomes. As can be seen, the only significant difference was between African Americans and Caucasians.

Table 4
Matrix Comparison of Racial Outcome data

Race	African-American	Other	Caucasian
African-American (Base)	N/A	$B = 0.51, p = .356$	$B = 0.60, p = .003^*$ $\text{Exp}(B) = 1.82$ $CI = [1.23, 2.71]$
Other (Base)		N/A	
Caucasian (Base)	$B = 0.60, p = .003^*$ $\text{Exp}(B) = 0.55$ $CI = [0.37, 0.81]$	$B = -0.09, p = .869$	N/A

Note. $\text{Exp}(B)$ = odds ratio, C.I. = confidence interval.

* Indicates significant relationship.

Hypothesis 3-Age. Is there a significant age group difference between those who complete the program and those who do not? It was predicted that there would be no difference in completion rates based on age.

H_0 : Completion rate is equal regardless of the age of the client.

H_A : There are differences in completion rate based on the age of the client.

The data in Table 14 in Appendix C lists the descriptive statistics of the age variable as $M = 37.81$ years old, $SD = 10.58$. The logistic regression of the continuous age of client variable equation suggested there was a difference in outcome based on age ($B = 0.05, p < .001, \text{Exp}(B) = 1.05, 95\% CIs = [1.03, 1.07]$). To further analyze the group differences, the

sample was coded into age groups of 18 to 25 years old, 26 to 39 years old, 40 to 49 years old and greater than 49 years old. Table 5 provides descriptive data for each group along with completion rates.

Table 5
Descriptive Statistics of Age Group Variable

Variable	Value	Frequency	Valid Percent	Number Completing	Completion Percent
Age group	18-25 Years Old	288	16.38	10	3.47
	26-39 Years Old	635	36.12	43	6.77
	40-49 Years Old	604	34.38	63	10.43
	>49 Years Old	231	13.14	35	15.15
	Total	1758	100.00	151	8.59

Table 6 summarizes the differences of age groups with regards to successfully completing the program at the Shelter.

Table 6
Matrix Comparison of Age Group Outcome Data

Age Group	18-25 Y.O.	26-39 Y.O.	40-49 Y.O.	> 49 Y.O.
18-25 Y.O. (Base)	N/A	$B = 0.77, p < .035^*$ $\text{Exp}(B) = 2.15$ $CI = [1.06, 4.38]$	$B = 1.30, p < .001^*$ $\text{Exp}(B) = 3.67$ $CI = [1.81, 7.42]$	$B = 1.74, p < .001^*$ $\text{Exp}(B) = 5.69$ $CI = [2.63, 12.23]$
26-39 Y.O. (Base)	$B = -0.77, p < .035^*$ $\text{Exp}(B) = 0.47$ $CI = [0.23, 0.95]$	N/A	$B = 0.53, p = .012^*$ $\text{Exp}(B) = 1.71$ $CI = [1.12, 2.59]$	$B = 0.97, p < .001^*$ $\text{Exp}(B) = 2.65$ $CI = [1.59, 4.40]$
40-49 Y.O. (Base)	$B = -1.30, p < .001^*$ $\text{Exp}(B) = 0.27$ $CI = [0.14, 0.55]$	$B = 0.53, p = .012^*$ $\text{Exp}(B) = 0.59$ $CI = [0.39, .89]$	N/A	$B = 0.44, p = .062$
> 49 Y.O. (Base)	$B = -1.74, p < .001^*$ $\text{Exp}(B) = 0.176$ $CI = [0.08, .38]$	$B = -0.97, p < .001^*$ $\text{Exp}(B) = 0.38$ $CI = [0.23, 0.63]$	$B = -0.43, p = .062$	N/A

Note. $\text{Exp}(B)$ = odds ratio, C.I. = confidence interval. *Indicates significant relationship.

As can be seen, there was a significant difference between all age groups with the exception of the 40 - 49 years old age group and the over 49 age group. This concurred with the analysis when using the continuous age variable that the odds of completing the program increased with the age of the client. The highest prediction was that a client over 49 years old had 5.69 the odds of completing the program compared to a client who is between the age of 18 and 25 years old. This analysis indicated that the null hypothesis of no difference based on age can be rejected and suggested there was a significant difference in the completion probability based on the age of the client. This finding refuted the predicted relationship that there would be no difference in the outcome based on age of the client.

Hypothesis 4-Veteran Status. Is there a significant veteran status group difference between those who complete the program and those who do not? It was predicted that the completion rate for veterans would be higher than that of non-veterans.

H₀: Completion rate is equal for veterans and non-veterans.

H_A: There is a group difference in completion rate between veterans and non-veterans.

The data in Table 13 in Appendix C indicated that the sample consisted of 91.35% of clients who are not veterans ($n = 1606$) and 8.65% of clients who were veterans ($n = 152$). The completion rate was 7.78% for non-veteran clients ($n = 117$) and 17.11% for veteran clients ($n = 34$). Despite the seemingly large difference, the data in Table 2 indicated the null hypothesis of completion rate being the same regardless of the veteran status of the client could not be rejected ($B = 0.39, p = .131$) and suggested that there is was a significant difference in the completion rate of clients who are veterans and those who are not. This was

contrary to the prediction by the researcher. However, there was a significant interaction between Veteran Status and Age Group and Veteran Status and Racial Group which is discussed in a separate section below.

Hypothesis 5-Drug of Choice. Is there a significant drug of choice group difference between those who complete the program and those who do not? It was predicted that there would be a difference in completion rate based on drug of choice.

H₀: Completion rate is equal regardless of drug of choice of the client.

H_A: There are group differences in completion rate based on the drug of choice of the client.

The drug of choice for cases in the sample and completion rate by each is listed in Table 7. For purpose group comparison, drug of choice group that represented less than 2% of the sample each were combined in a group of “Other.”

Table 7
Descriptive Statistics of Drug of Choice Variable

Variable	Value	Frequency	Valid Percent	Number Completing	Completion Percent
Drug of choice	Alcohol	271	15.42	26	9.59
	Alcohol & Crack	484	27.53	37	7.64
	Crack	123	7.00	6	4.88
	Heroin	14	0.80	0	0.00
	Marijuana	11	0.63	0	0.00
	Other Opiate	9	0.51	0	0.00
	Other Stimulant	4	0.23	0	0.00
	Poly Drug Use	842	47.90	82	9.74
	Total	1758	100.00	151	8.59

Table 7-continued

Drug of Choice Group	Alcohol	271	15.42	26	9.59
	Crack	123	7.00	6	4.88
	Alcohol and Crack	484	27.53	37	7.64
	Poly Drug Use	842	47.90	82	9.74
	Other	38	2.16	0	0.00
	Total	1758	100.00	151	8.59

Even after combining those drugs of choice with less than a 2% occurrence into a single category of “Other,” no program completions were found for this group. This fact introduced an issue of complete separation and, therefore, the Drug of Choice variable of “Other” had to be removed from the analysis. It can be said that the completion rate for those declaring their drug of choice to be heroin, marijuana, other opiate, or other stimulant had a zero percent completion rate. However, due to the inability to include this in the analysis, it could not be said that these drugs or the drug of choice category of “Other” significantly differed or did not differ from other drugs of choice. For all other Drug of Choice categories, the null hypothesis of the completion rate being the same could not be rejected: Crack vs. Alcohol and Crack ($B = 0.28, p = .728$), Crack vs. Alcohol ($B = 0.03, p = .955$) and Crack vs. Poly Drug ($B = 0.47, p = .300$). This suggested that there was not a significant difference in the completion rate based on a client’s drug of choice. Due to the inability to include the “Other” drug of choice category, it was not possible to assess the original outcome prediction that there would be a difference in outcome based on the client’s drug of choice.

Hypothesis 6-Age of First Use. Is there a significant age of first use difference between those who complete the program and those who do not? It was predicted that the completion rate for those whose first use at a higher age would be higher than those clients whose first use was at a younger age.

H₀: Completion rate is equal regardless of age of first AOD use of the client.

H_A: There are group differences in completion rate based on the first AOD use of the client.

As stated previously, due to concerns with the validity of the construct of Age of First Use, the data presented in this section should be viewed with caution. The data in Table 14 in Appendix C lists the descriptive statistics of the Age of First Use variable as $M = 14.63$, $SD = 4.63$. The logistic regression of the continuous Age of First Use variable suggested there is no difference in outcome based on the age of first use ($B = 0.02, p < .463$). The sample was coded into first use groups of under 11 years old, 11 to 17 years old, 18 to 20 years old and greater than 20 years old. Table 8 provides descriptive data for each group.

Table 8
Descriptive Statistics of Age of First Use Variable

Variable	Value	Frequency	Valid Percent	Number Completing	Completion Percent
Age of first use group	<11 Years Old	221	11.91	17	7.69
	11-17 Years Old	1223	55.35	113	9.24
	18-20 Years Old	147	28.17	8	5.44
	>20 Years Old	138	4.57	12	8.70
Total (Non Missing)		1729	100.00	150	7.77
Missing	System	29		1	3.45
Total		1758		151	8.59

Group comparison using logistic regression suggested the null hypothesis of the completion being the same for all Age of First Use groups could not be rejected: 18-20 years old vs. 1-10 years old ($B = 0.49, p = .412$), 18-20 years old vs. greater than 20 years old ($B = 0.76, p = .189$) and 18-20 years old vs. 11-17 years old ($B = 0.73, p = .090$). These results suggested that there was not a significant difference in the completion rate based on a client's age of first use. This was contrary to the prediction by the researcher. It was thought that those individuals who began using AODs at a later age would have a higher probability of completing the Shelter's program than those who started at a younger age.

Hypothesis 7-Length of Use. Is there a significant length of use difference between those who complete the program and those who do not? It was predicted that the completion rate for those who had used substances for a shorter period of time would be higher than those clients who had used for longer.

H_0 : Completion rate is equal regardless of length of use of the client.

H_A : There are group differences in completion rate based on the length of use of the client.

Like Age of First Use, the validity of the construct of this variable is questionable as it is based on Age of First Use and, therefore, the data presented in this section should also be viewed with caution. The data in Table 14 in Appendix C lists the descriptive statistics of the Length of Use variable as $M = 23.18, SD = 10.92$. The logistic regression of the Length of Use variable suggested there was no difference in outcome based on the length of use ($B = -0.02, p < .463$). To further analyze the group differences, the sample was coded into

first use groups of under 11 years of use, 11 to 20 years of use, 21 to 30 years of use and greater than 30 years of use. Table 9 provides descriptive data for each group.

Table 9
Descriptive Statistics of Length of Use Variable

Variable	Value	Frequency	Valid Percent	Number Completing	Completion Percent
Length of Use	0-10 Years	296	17.12	13	4.39
	11-20 Years	410	23.71	23	5.61
	21-30 Years	501	28.98	52	10.38
	> 30 Years	522	30.19	62	11.88
Total (Non Missing)		1729	100.00	150	8.06
Missing	System	29		1	3.45
Total		1758		151	8.59

Group comparison using logistic regression suggested the null hypothesis of the completion rate being the same for all Length of Use groups could not be rejected: 1-10 years of use vs. 11-20 years of use ($B = 0.51, p = .489$), 1-10 years of use vs. 21-30 years of use ($B = 0.25, p = .648$) and 1-10 years of use vs. greater than 30 years of use ($B = 0.48, p = .135$) These results suggested that there was not a significant difference in the completion rate based on a client's length of use. This was contrary to the prediction by the researcher. It was thought that those individuals who used AODs for a shorter number of years have a greater probability of completing the Shelter's program than those who had used for more years.

Hypothesis 8-New/Return Client Status. Is there a significant difference between those who have had multiple treatments at the Shelter and those who have not? It was

predicted that the completion rate for those clients who had entered the program more than once would be higher than those who were on their first entrance.

H₀: Completion rate is equal regardless of whether the client is a new or return client.

H_A: There are group differences in completion rate based whether the client is a new or return client.

The data in Appendix C indicates that the sample consisted of 74.86% of cases where the client was entering the Shelter program for the first time (New Client, $n = 1316$) and 25.14% of clients who were returning to the program after previously leaving before completion (Return Client, $n = 442$). The completion rate was 8.81% for new clients ($n = 116$) and 7.92% for returning clients ($n = 35$). The null hypothesis of the completion rates of new and return being the same was not rejected ($B = -0.07, p = .73$) and suggested that there was not a significant difference in the completion rate of clients who were new to the program and those who were returning. This was contrary to the prediction by the researcher. It was thought that those individuals who had previous experience in the program knew what to expect, had built previous relationships, had prior treatment experience and, hence, would have had higher rates of completion than those who were new to the program.

Interactions. Although not included in the hypothesis set, analysis was conducted to search for interaction between variables. This investigation evidenced significant interaction between the variable of Veteran Status and the variables of Age and Race Group. The interaction analysis was conducted with both interactions in the group-wise comparison at the same time. Due to the issue of complete separation (a single instance of the combination of race "Other" and Veteran status of "Veteran"), the analysis could not be run while

maintaining a three-race group structure. Therefore, racial groups of African American and Non-African American were constructed. It was decided to combine in this manner as the veteran completion rate for the race of “Other” was closer to that of Caucasian than African American. The model including interactions is shown in Table 10.

Interaction of veteran status and racial group. Veteran status demonstrated a significant interaction with racial group (African American versus Non-African American ($B = 1.67, p < .013, \text{Exp}(B) = 5.30, 95\% \text{ CIs} = [1.41, 19.91]$). This indicated that the odds ratio of a non-African American Veteran completing the program was 5.302 times that of an African American Veteran. Considering this interaction, although the p -value of Veteran did not become significant ($B = 2.30, p < .071$), the p -value of the variable Racial Group moved from being significant to not significant ($B = 0.38, p < .071$). This interaction is illustrated in figure 4.1.

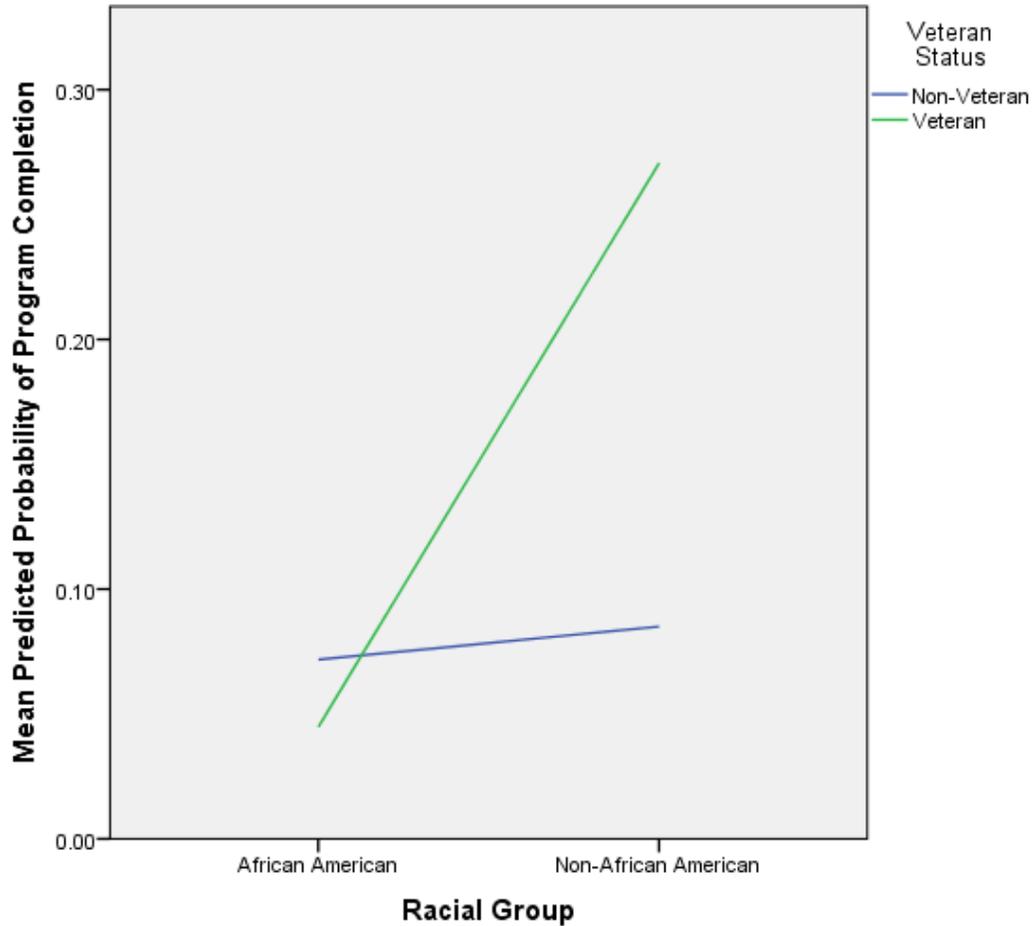


Figure 1—Interaction of Veteran Status and Racial Group

Interaction of veteran status and age. Veteran status demonstrated a significant interaction with age when left as a continuous variable ($B = 0.06, p < .001, \text{Exp}(B) = 1.05, 95\% \text{ CIs} = [0.89, 0.98]$). Investigation of the interaction of Veteran Status by Age Group showed there to be no significant relationship between veteran status and age group 26-39 ($B = -2.58, p < .100$) and age group 40-49 ($B = -2.52, p < .081$). However, there was a significant interaction effect between veteran status and those clients older than 49 years ($B = -3.31, p = .032, \text{Exp}(B) = .04, 95\% \text{ CIs} = [0.00, 0.75]$). This indicated that the odds ratio of a

veteran completing the program diminished as he/she aged where as this is not true for a non-veteran. It is noted that this interaction did not change the overall fact that the variable of age was significant. However, it did modify the statistics associated with the age variable to $B = 0.06$, $p < .001$, $\text{Exp}(B) = 1.06$, 95% CIs = [1.04, 1.08]. These interactions are graphed in figures 2 and 3.

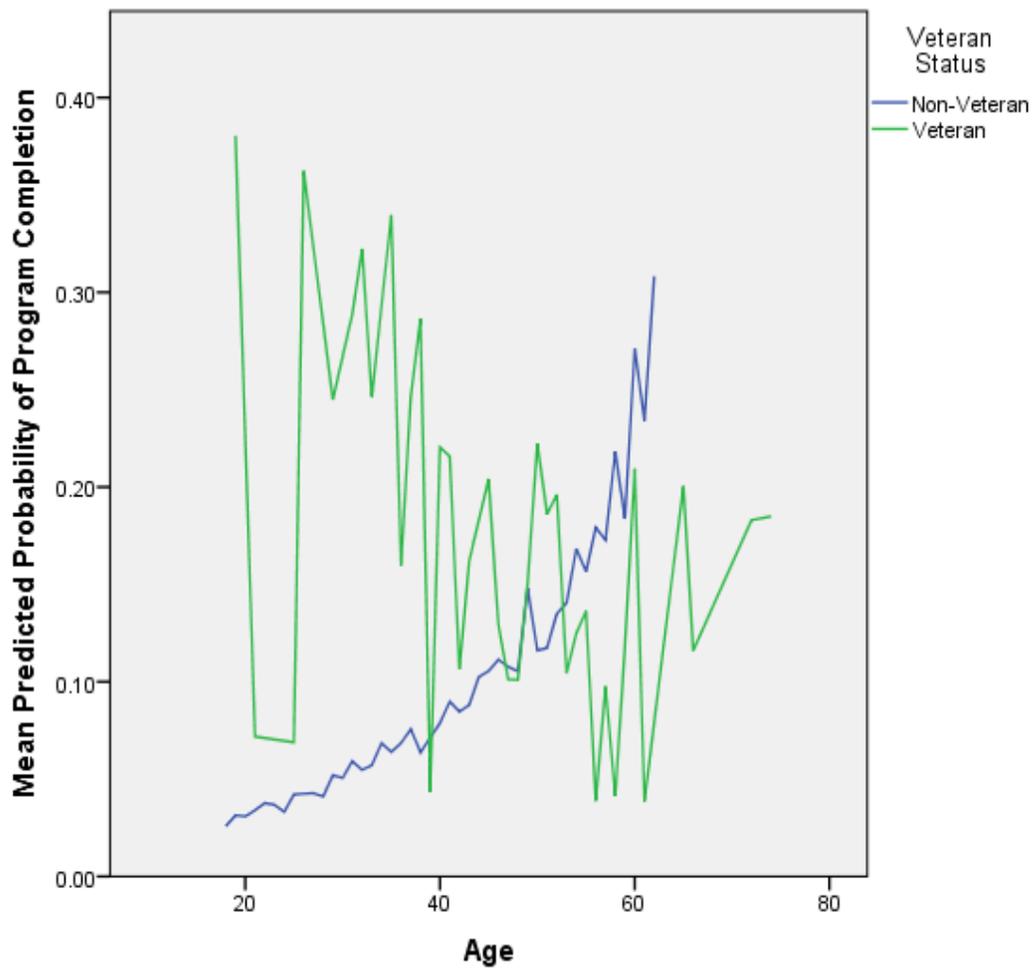


Figure 2—Interaction of Veteran Status and Age

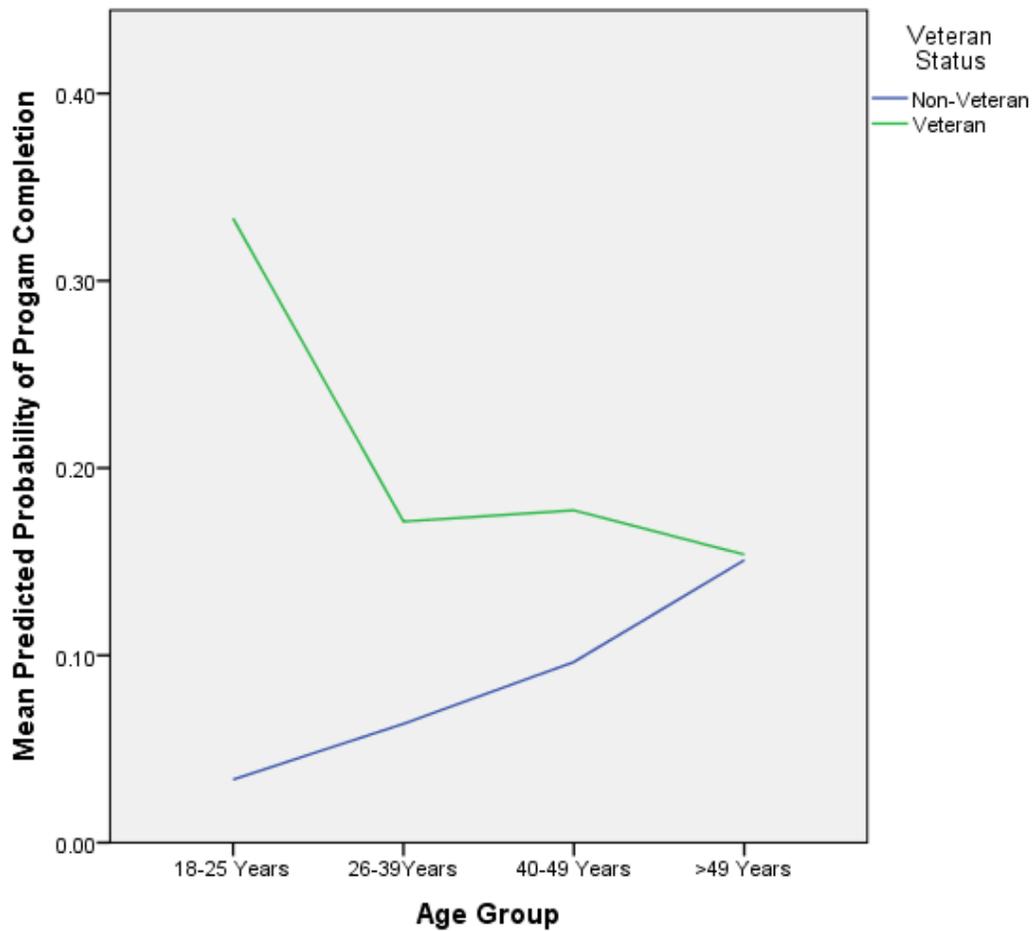


Figure 3—Interaction of Veteran Status and Age Group

Prediction Model

Two models were generated to predict the likelihood that a client completed the sobriety program at the Shelter. Each used the variables of Gender, Racial Group, Age, Veteran Status, Drug of Choice and New/Return Client. For data integrity reasons previously cited, Age of First Use and Length of Use were not used in the prediction model. The first model used only these variables as shown in Table 2 whereas the second model used

these variables and included the two interactions shown to be significant predictors of outcome. The full model including interactions is shown in Table 10.

Table 10
Variables in the Equation with Interactions

	<i>B</i>	<i>SE</i>	Wald	<i>df</i>	<i>p</i>	Exp(<i>B</i>)	95% CI for EXP(<i>B</i>)	
							Lower	Upper
Gender (Female)	0.63	0.21	8.90	1	.003	1.89	1.24	2.87
Veteran (Non-Vet)	2.30	1.27	3.25	1	.071	9.95	.82	120.79
New/Ret (New)	-0.07	0.21	0.12	1	.733	0.93	.62	1.40
Race group (AA)	0.38	0.21	3.25	1	.071	1.47	.97	2.22
DOC group			3.56	3	.313			
DOC (Crack)	0.35	0.46	0.57	1	.449	1.42	.58	3.50
DOC Alc+Crack	0.18	0.49	0.13	1	.718	1.19	.46	3.11
DOC Alcohol	0.56	0.45	1.56	1	.212	1.76	.73	4.26
DOC Poly	0.06	0.01	33.04	1	.000	1.06	1.04	1.08
Non AA by Vet	1.67	0.68	6.10	1	.013	5.30	1.41	19.92
Age by Vet	-0.07	0.02	8.20	1	.004	0.93	.89	.98
Constant	-5.83	0.64	83.56	1		0.00		

Note. Exp(*B*) = odds ratio, C.I. = confidence interval. Variable(s) entered on step 1: Sex, Veteran, NewReturn, RaceGroup, DrugGroup, Age, RaceGroup* Veteran, Age* Veteran. Value in parentheses represents base value or the zero value of the dummy variable.

A test of the full Model 1 shown in Table 2 against a constant only model was statistically significant indicating that the predictors, as a set, reliably distinguished between the completers and non-completers (chi square = 58.82, $p < .001$ with $df = 9$). The Hosmer-Lemeshow test indicated that this model is a good fit (chi square = 9.89, $p = .344$ with $df = 8$). Nagelkerke's R^2 of .075 and Cox and Snell R^2 of .034 indicated a moderately strong relationship between prediction and grouping. Prediction success overall was 91.2% which did not differ from the original model. This model provided completion estimates ranging

from 1.11% to 44.49%. The prediction model after removing non-significant variables is shown in Table 11.

Table 11
Variables in the Model 1 Equation

Variable	<i>B</i>	<i>SE</i>	Wald	<i>df</i>	<i>p</i>	Exp(<i>B</i>)	95% C.I. for Exp(<i>B</i>)	
							Lower	Upper
Gender Male	0.64	0.21	8.92	1	.003	1.89	1.24	2.87
Race Caucasian	0.60	0.20	8.94	1	.003	1.82	1.23	2.70
Age	0.05	0.01	27.06	1	.000	1.05	1.03	1.07
Constant	-5.43	0.59	82.45	1	.000	0.00		

Note. Exp (*B*) = odds ratio, C.I. = confidence interval.

The test of the full Model 2, which included the interactions against a constant only model, was statistically significant indicating that the predictors as a set reliably distinguished between the completers and non-completers (chi square = 77.81, $p < .001$ with $df = 10$). The Hosmer-Lemeshow test indicated that this model is a good fit (chi square = 5.35, $p = .719$ with $df = 8$). Nagelkerke's R^2 of .099 and Cox and Snell R^2 of .044 indicated a moderate relationship between prediction and grouping. Prediction success overall was 91.2%, which did not differ from the original model. As a reminder, the racial grouping for this model was consolidated to African-American and non-African American in order to be able to use the interaction terms. This model provided completion estimates ranging from 0.95 % to 38.05%.

The prediction model after removing all non-significant variables is shown in Table 12.

Table 12

Variables in the Model 2 Equation

	<i>B</i>	<i>SE</i>	Wald	<i>df</i>	<i>p</i>	Exp(<i>B</i>)	95% C.I. for EXP(<i>B</i>)	
							Lower	Upper
Gender Male	0.64	0.21	8.90	1	.003	1.89	1.24	2.87
Age	0.06	0.01	33.04	1	.000	1.06	1.04	1.08
Non AA by Vet	1.67	0.68	6.10	1	.013	5.30	1.41	19.92
Age by Vet	-0.07	0.02	8.20	1	.004	0.93	0.89	0.98
Constant	-5.83	0.64	83.56	1	.000	0.00		

Note. Exp(*B*) = odds ratio, C.I. = confidence interval.

Conclusion

In this section, the findings of the logistic regression, an analysis of the hypotheses and the predictions of the hypotheses were presented. Additionally, two prediction models were generated. Gender, Race and Age proved to be significant factors predicting the probability of a client completing the Shelter's recovery program as stand alone variables. When the analysis included interactions of the Veteran Status variable with Age and Racial Group, the client's race was no longer significant, but there was a strong interaction in each of these variable combinations. The two models generated proved to be significant predictors of outcome probability.

CHAPTER V—DISCUSSION

The goal of this study was to assess and document the effect of eight demographic and substance abuse variables on completion of a sobriety program at the Shelter. The Shelter is a non-profit organization that offers a program in which self-reported homeless individuals participate in a long-term, residential, social recovery program which implements ARM principles. Many studies were found that focused on the singular subjects of substance abuse among homeless populations, social recovery programs and ARM. However, few were found that focused on the integration of all three. This study sought to add to the substance abuse recovery literature by testing eight hypotheses on the outcome variable and by using the variables to build a prediction model for program completion. The findings discussed below provide a basis for additional qualitative and quantitative research aimed at constructing programs and interventions that better serve homeless individuals. This discussion section includes a summary of the results, discussion of potential contributing factors for those results, limitations and possible generalizability of the findings, implications for practice and policymakers and recommendations for future research.

Summary of Findings

The goal of this work is to answer eight research questions and generate an outcome prediction model base on these results: a) Is there is a significant gender group difference between those who completed the program and those who did not? b) Is there is a significant racial group difference between those who completed the program and those who did not? c) Is there a significant age group difference between those who completed the program and those who did not? d) Is there a significant veteran status group difference between those

who completed the program and those who did not? d) Is there a significant drug of choice group difference between those who completed the program and those who did not? e) Is there a significant age of first use difference between those who completed the program and those who did not? f) Is there a significant length of use difference between those who completed the program and those who did not? g) Is there a significant difference between those who had multiple treatments at the Shelter and those who did not? The outcomes and potential contributing factors to these findings are discussed below. However, as with much ex post facto data, the outcomes may evoke more questions than it does provide answers.

Many of the group differences could have included factors with respect to the amount of “recovery capital” possessed by each group. When looking at the ability to complete treatment programs and ultimately become sober and maintain long-term sobriety, there is a great deal of focus on internal and external recovery capital. The concept of recovery capital was introduced in the seminal work of Robert Granfield and William Cloud, *Coming Clean: Overcoming Addiction without Treatment* (1999). These authors define recovery capital as the amount and strength of internal (self-efficacy, desire, willingness to seek help, etc.) and external (familial support, peer support, etc.) resources that can be brought to bear to initiate and sustain recovery from substance abuse issues. The amount of recovery capital and the ability to leverage it differs from individual to individual. William White (n.d.) suggests that recovery capital interacts with the intensity of the substance abuse problem to impact the level of care needed and the availability of recovery supports. It is evident that those clients in a homeless shelter may have, if not less, certainly different internal and external recovery

capital than those who are not homeless. The findings of this study are likely to be impacted by the nature of recovery capital among the clients at the Shelter.

The finding of research question one as to whether there is a difference between completion rates of males and females indicate that the completion rate of males (10.79%) is significantly different from that of females (5.04%) ($B = 0.64$, $p = .003$, $\text{Exp}(B) = 1.90$, 95% CIs = [1.22, 2.87]). This result differs with the outcome found in the 2009 Treatment Episode Data Set (Substance Abuse and Mental Health Services Administration [SAMSHA], 2011) that finds similar outcomes for males and females in inpatient programs. However, this comparison may be of questionable validity as the Shelter's program differs greatly from the most prevalent 30-day, professional program. The length of the program (12-18 months) may significantly impact the ability of women with children to complete it. As women are most frequently the prime custodian of minor children, they may not be able to arrange childcare for such an extended stay in a recovery program. It is thought that there may be a limit to the amount of time family or other substitutes will tolerate the absence of a child's primary caregiver. It is noted that the completion rates for the first two phases of the program are approximately the same for males and females, but females drop out at a higher rate later in the program. The findings of Brady and Ashley (2005) support this assessment in noting that programs that provide childcare options have higher completion rates than those that do not.

Another possible explanation, as noted previously in this study, is that there is potential mono-operational bias of the outcome variable in that it suggests success is singularly measured by completion of the program. Hence, some female (as well as male)

clients may become sober and maintain a degree of extended recovery without fully completing the Shelter's program. It is possible that female clients recover with less treatment and are able to successfully remain sober with a shorter stay in the Shelter's program. Additionally, it is possible that females benefit from a lower severity of problems from their substance abuse, have more and/or stronger recovery capital and/or are welcomed back into society and the family more quickly than male clients.

The outcome of research question two indicates that there is a significant difference in completion rate based on racial group with African Americans having a significantly lower completion rate than Caucasians ($B = 0.60$, $p = .003$, $\text{Exp}(B) = 1.82$, $\text{CI} = [1.23, 2.71]$). The difference between African Americans and Caucasians compared to all other races is not significant. This finding is not surprising as it is consistent with the 10-year outcome data in the Treatment Episode Data Set (SAMSHA, 2011) and findings by Saloner and Le Cook (2013). These researchers suggest that the disparity is largely caused by unemployment and housing instability.

There may be other explanations as well. This difference could be attributed to the disparities in mental health diagnosis and treatment for African Americans. Lawson and Lawson (2013) state that "African Americans are more likely to show such disparities in mental health as misdiagnosis, lack of treatment access and poorer outcomes" (p. 1). This could lead to African American clients entering the Shelter's program with undiagnosed and/or untreated co-occurring mental health disorders that impact the completion rate. The stigma of mental illness in the African American community (Lawson & Lawson, 2013) is likely also to lead to a degree of shame or secrecy that negatively impacts the course of

treatment. Increasing the challenge for the African American client to complete the program is the fact that the Shelter's leadership and staff are predominately Caucasian, and there is likely to be some disparity in outcome. An increase of the number African American practitioners or additional cultural competency may help in addressing this disparity.

Additionally, there is likely to be some disparity in the recovery capital between African Americans and Caucasians within or external to the Shelter. It is possible that indigenous support structures within the African American community are stronger or more willing to accept the return of the substance abuser before completion on the Shelter's program. Also, it can be questioned as to whether there is a racial disparity in internal and/or external recovery capital when a client enters the program or whether there is a disparity in uptake of recovery capital while in the program.

The final stand-alone independent variable that shows a significant effect on program completion is the age of the client that is addressed in research question three. While left as a continuous variable, age was determined to be a significant variable ($B = 0.05, p < .001, \text{Exp}(B) = 1.05, 95\% \text{ CIs} = [1.03, 1.07]$). When divided into groups of age groups of 18 to 25 years old, 26 to 39 years old, 40 to 49 years old and greater than 49 years old, there was a significant difference between all groups except for the 40 to 49 years old and over 49 years old group (see Table 6 for details) with older groups being more likely to complete the program. The largest difference is between 18 to 25 year olds and those over 49 years old with the latter demonstrating 5.685 times the odds of completing the program than the former. This finding is not surprising and is consistent with the majority of the research on the relationship between age and substance abuse treatment outcome. Hoffman (2013)

concur with this finding stating that being under the age of 25 and/or having never been married introduce additional risk of relapse.

Also, there is the possibility that younger clients have less of a history of substance abuse, fewer problems caused by substance abuse, and can achieve recovery with a shorter intervention than the full program at the shelter. Conversely, it is possible that younger clients simply have not experienced enough problems and pain brought on by substance abuse and do not feel the need to become completely abstinent. Whereas younger clients often feel as if they have the prerogative to use substances as a right of passage, many of the older clients express a feeling of “being sick and tired of being sick and tired” and have strong desire to make a change. Likewise, the motivation to change may vary between age groups. While a younger adult may enter the program upon the urging of others and early in the stages of change, older clients appear to generally be in the program of their own volition and are further along in the stages of change.

It was surprising that the variable of veteran status was not significant as a stand alone variable. Predicted outcome four states that veterans would be more likely to complete the program than non-veterans. However, the findings indicate that veteran status was not a significant variable ($B = 0.39, p = .131$). It was thought that veterans would be more mature, more disciplined and have developed additional recovery capital and, therefore, be more likely to complete the Shelter’s program.

Further analysis uncovered a significant interaction between veteran status and race. Non-African American veterans demonstrated 5.302 times the odds of completing the program than other groups. Surprisingly, inclusion of this interaction term changed the race

variable to be not significant at $p = .05$ ($B = 0.38, p = .071$). Inclusion of the interaction did not change the hypothesis outcome on the veteran status but did change the statistics to $B = 2.30, p = .071$. This outcome suggests the need for research to understand the difference between African American and non-African American veterans. It could be possible that the severity of substance abuse issues is higher in African American veterans than non-African American veterans. There is also the possibility that the military is doing a better job of treating non-African Americans for mental illnesses such as post-traumatic stress disorder. Another possible explanation is that African American military personnel hide mental illness due to the stigma in society. However, unless there has been a recent change, it is doubtful that there is actually a racial disparity in the diagnosis of mental illness among veterans as Seal, Bertenthal, Miner, Sen and Marmar, (2007) found the diagnosis rates to be very similar between Blacks and Whites. Of course, this leaves the possibility that there is actually more mental illness among Black veterans and the diagnosis rate should be disparate. This was the most alarming outcome of this study and leaves many questions to be answered.

An interaction was also detected between the continuous variable of age and veteran status ($B = 0.06, p < .001, \text{Exp}(B) = 1.05, 95\% \text{ CIs} = [0.90, 0.98]$). However, the only significant group difference was between veterans older than 49 years and veterans between 18 and 25 year old ($B = -3.31, p = .032, \text{Exp}(B) = .036, 95\% \text{ CIs} = [0.00, 0.75]$). Due to the very small sample of veterans in the 18 to 25 years old age group, little importance is given to this difference.

The research question concerning drug of choice predicted that there is a difference in completion rate depending on the client's drug of choice. Although it is apparent that there is

a difference between those with drugs categorized in the “Other” group (marijuana, opiates and stimulants other than crack cocaine) and all other groups, it was not possible to quantify this relationship due to complete separation of the variables. That is to say, of the 38 clients in the sample who list their drug of choice to be marijuana, opiates, or stimulants other than crack cocaine, there were no program completions.

There was no significant group difference among the other drug of choice groups in the sample. The reason for the drugs in the group “Other” having a different outcome rate than all other categories maybe because marijuana is arguably viewed as the least harmful of the drugs and heroin/other opiates are viewed as the most harmful. With recent legislation in some states legalizing medical and/or recreational marijuana, sentiment seems to be changing to not viewing this as a drug of abuse. When the attitude of “Well, it’s just weed” is adopted by more individuals, the need for treatment is discounted. This may lead to clients leaving the program after a short time with the problems from marijuana abuse being forgotten. The opiate class of drugs is quite rightly considered to be one of the most dangerous and resistant to recovery due to the combination of physical and psychological dependence. As the Shelter is a social program and does not offer or allow medications to facilitate recovery, opiates are particularly problematic. The previous two observations in combination with the fact that most of the clients in the drug of choice group of “other” are young, yields an inordinate non-completion rate.

Hypotheses six and seven addressed the research questions of whether age of first use and length of use are significant predictions of completion. After research as to the quality of the construct of “first use,” it was determined that the variable was not sufficiently clear to

draw conclusions. Nevertheless, logistic regression was performed and it indicated no significant relationship in the continuous variables or when the data is divided into groups.

The final research questions investigated whether there was a difference in outcome between those clients who were entering the Shelter's recovery program for the first time and those who had previously attempted to complete the program. It was predicted that those who were returning clients would benefit from the prior treatment, have the advantage of knowing what to expect, and would more easily transition into the rigors of the program. However, this was not the case. New and return clients did not have a significant difference in outcome ($B = -0.07, p = .728$).

Limitations and Generalizability

As with all studies, there are some limitations to generalizing the findings of this work. The clients in this study are individuals who are voluntarily seeking treatment for substance abuse issues and are, by self-report, homeless. These clients may differ from all homeless individuals or from those suffering with substance abuse issues who are not homeless. The Shelter's program is a social, peer-led, long-term recovery program which implements ARM principles. The findings might not be generalizable to programs who do not match some or all of these features. Additionally, the data came from a single program located in the Southeastern United States; the results may not be generalizable to other locations.

The results of this study may be generalizable to the limited number of other programs that are substantially the same as the program at the Shelter. Additionally, some of the findings are likely to be generalizable to other programs for homeless individuals and

other social recovery programs but additional research would be needed to confirm this. It is thought that the results are likely to be generalizable to matching programs in the future providing that they implement the same features and processes and that care is given to closely match the engagement and retention procedures of the Shelter.

Implications for Practice and Policymakers

The one-year outcome surveys of the Shelter have indicated that 70% of the participants are sober, tax-paying citizens one year after completion of the program. Considering that the individuals entering the program are homeless and probably represent some of the most challenging cases for recovery, this is an astounding success. Although the completion success rate is under 10%, a financial evaluation indicated that the individuals who complete the program more than off-set program costs in reduced health care costs, incarceration costs and additions to the tax base. The program cost per night is only a fraction of other alternatives such as incarceration or hospitalization. Policymakers should consider the merits of such a program and encourage further development of alternative programs that demonstrate positive outcomes and overall financial benefit. The findings in this study should encourage policymakers to look closely at ways to engage and retain younger individuals, minorities and women in treatment. Prevention efforts should be aimed at more quickly and effectively addressing the needs of young individuals to avoid a life of substance abuse and homelessness. Efforts should be made to provide childcare to mothers who seek program participation. Innovative plans must be put in place to retain minority clients in treatment.

It is hoped that these findings will open the minds of practitioners to treatment options other than those typically offered in the 30-day, inpatient hospital. There is hope for homeless citizens with severe substance abuse and mental health issues to recover and lead fulfilling lives. Not only can long-term treatment be successful, but it can also be the fiscally responsible option. It is especially important that practitioners understand substance abuse to be a chronic disease that requires early intervention, aggressive intervention, regular maintenance and follow up.

Implications for Further Research

This research is likely to spawn as many or more questions than it actually answers. Although this study provides outcomes of ex post facto data and suggests possible cause and effect relationships, there is a great need for additional qualitative and quantitative research to confirm or dispute these theories. Particular attention is needed to test intervention and program modifications aimed at increasing the completion rate and removing demographic disparities in completion rates.

It is hoped that further research will be conducted on the variables that displayed significant group differences. Gender showed a significant difference with females having lower odds of completing the program. Research should be conducted to investigate this disparity and focus on the whether and the extent to which being a primary caregiver for minor children affects completion rates. Younger clients showed a significantly higher rate of not completing the program than did older clients. Addressing this disparity is particularly important as early intervention could prevent a lifetime of substance abuse issues. Research is recommended to implement and measure innovative ideas to increase the retention of

young clients in treatment. Finally, investigation of the stunning disparity between completion rates of African American and non-African American veterans is urged. At a time when the United States has been in continuous military interventions for over 10 years, it is concerning that African American veterans are not on par with non-African American veterans in completion rate.

It is recommended that additional follow-up of clients be conducted. Research is recommended to determine if there is any substantial recovery among those who did not complete the program. It is possible that some of those who did not fully complete the program attained enough skills during their stay to reach recovery. Research of this nature would help to identify the most effective length for a recovery program of this type. Follow-up research of completers at points beyond one year would also be informative and is recommended. Additionally, this follow-up would provide an opportunity for individuals re-engage, if needed.

It is recommended that research be conducted to compare the Shelter's program to other professional and social rehabilitation programs of varying lengths. As well as longitudinal sobriety outcome analysis, this research should include quality of life and financial outcome analysis.

Lastly, studies of ARM have shown this framework to be highly effective. Research should continue in the area of applying the principles of this framework to the breadth of recovery programs.

Conclusion

It is important that the substance abuse treatment professionals remain open to and understand programs outside of the predominant professional delivery systems. Social programs deliver interventions that successfully equip clients with the tools for extended recovery and may be better suited to certain clients who have experienced high severity substance abuse problems or who have been homeless. The presented findings add to the body of research by elucidating group differences in completion rate and providing a prediction model for completion for clients of a long-term, residential, social recovery program for self-reported homeless individuals that implements ARM principles. Substance abuse professionals and program administrators could use these findings to develop and refine interventions aimed at increasing retention rates of clients in treatment and leading to increased program completion and recovery. Lastly, recommendations are offered for future research and suggestions made for changes in policy that would facilitate engagement and retention of needy individuals in treatment. It is hoped that this research will bring about healing and recovery to some of the most overlooked members of society.

REFERENCES

- American Psychological Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Borkman, T. (1998). Resident self-governance in social model recovery programs.. *Contemporary Drug Problems*, 25(4), 1-12.
- Borkman, T. J., Kaskutas, L., Room, J., Bryan, K., & Barrow, D. (1998). An historical and developmental analysis of social model programs. *Journal of Substance Abuse Treatment*, 15(1), 7-17. [http://dx.doi.org/10.1016/S0740-5472\(97\)00244-4](http://dx.doi.org/10.1016/S0740-5472(97)00244-4)
- Borkman, T., Kaskutas, L., & Owen, P. (2007). Contrasting and converging philosophies of three models of alcohol/other drugs treatment: Minnesota Model, Social Model and Addiction Therapeutic Communities. *Alcoholism Treatment Quarterly*, 25(3), 21-38. http://dx.doi.org/10.1300/J020v2503_03
- Brady, T. M., & Ashley, O. S. (2005). *Women in substance abuse treatment: Results from the alcohol and drug services study (ADSS)*. Retrieved from Substance Abuse and Mental Health Services Administration: www.samhas.gov
- Braucht, G. N., Reichardt, C. S., Geissler, L. J., Bormann, C. A., Kwiatkowski, C. F., & Kirby, M. W. (1995). Effective services for homeless substance abusers. In G. J. Stahler, & B. Stimmel, *The effectiveness of social interventions for homeless substance abusers*, (pp. 87-109). New York, NY: The Haworth medical Press.
- Burt, M. R., Aron, L. Y., Douglas, T., Valente, J., Lee, E., & Iwen, B. (1999). *Homelessness: Programs and the people they serve*. Retrieved from Urban Institute: www.urbaninstitute.org

California Dept. of Alcohol and Drug Programs. (2004). *Social model recovery: Fact sheet*.

Sacramento, CA: California Dept of Alcohol and Drug Programs.

Code of Federal Regulations Title 45 – Part 46 – Protection of Human Subjects, 46 CFR § 46

(U.S. Department of Health and Human Services 2009).

Dennis, M., & Scott, C. K. (2012). Four-year outcomes from the Early Re-Intervention (ERI) experiment using Recovery Management Checkups (RMCs). *Drug and Alcohol*

Dependence, 121, 10-17. doi:10.1016/j.drugalcdep.2011.07.026

Dietz, T. L. (2007, September 1, 2007). Predictors of reported current and lifetime substance abuse problems among a national sample of U.S. homeless. *Substance Use & Misuse*,

42, 1745-1766. <http://dx.doi.org/10.1080/10826080701212360>

Ettner, S. L., Huang, D., Evans, E., Ash, D. R., Hardy, M., Jourabchi, M., & Hser, Y. (2006).

Does drug abuse treatment work. In R. Goldberg (Ed.), *Taking sides: Clashing views in drugs and society*, (pp. 419-432). Boston, MA: McGraw-Hill Higher Education.

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). Thousand Oaks, CA: Sage

Publishing Inc.

Fraenkel, J. R., & Wallen, N. E. (2008). *How to design and evaluate research in education*

(7th ed.). New York, NY: McGraw-Hill.

Frisk, D., Rakfeldt, J., & McCormack, E. (2006). Assertive outreach: An effective strategy

for engaging homeless persons with substance use disorders into treatment. *Journal of Drug and Alcohol Abuse*, 32, 479-486.

<http://dx.doi.org/10.1080/00952990600754006>

- Galanter, M., Dermatis, H., Egelko, S., & De Leon, G. (1998). Homelessness and mental illness in a professional- and peer-led cocaine treatment clinic. *Psychiatric Services*, 49(4). Retrieved from <http://journals.psychiatryonline.org/article.aspx?articleid=81272>
- Gerstein, D. R., Johnson, R. A., Foote, M., Suter, N., Jack, K., Merker, G., ... Fountain, D. (1994). *Evaluating recovery services: The California drug and alcohol treatment assessment* (California Department of Alcohol and Drug Programs). Retrieved from <http://sociology-data.sju.edu/2295/2295mr.pdf>
- Goldberg, R. (2006). *Taking sides: Clashing views in drugs and society* (8th ed.). Boston, MA: McGraw-Hill Higher Education.
- Granfield, R., & Cloud, W. (1999). *Coming clean: Overcoming addiction without treatment*. New York, NY: University Press.
- Heppner, P. P., Wampold, B., & Kivlighan, D. M. (2008). *Research design in counseling*. Belmont, CA: Thomson Higher Education.
- Hester, R. K., & Miller, W. R. (2003). *Handbook of alcoholism treatment approaches: Effective alternatives* (3rd ed.). New York, NY: Pearson.
- Higgins, S. T., & Silverman, K. (1999). *Motivating behavior change among illicit drug abusers: Research on contingency management interventions*. Washington, DC: American Psychological Association.
- Hoffman, N. G. (2013). Simplifying outcome monitoring. *Addiction Professional*, 10(6), 10-15.

- Hser, Y., & Anglin, M. D. (2011). Addiction recovery and recovery careers. In J. F. Kelly, & W. L. White (Eds.), *Addiction recovery management: Theory, research and management*, (pp. 9-29). New York, NY: Springer.
- Kaskutas, L. (1999). *The social model approach to substance abuse recovery: A program of research and evaluation*. Retrieved from <http://numerons.files.wordpress.com>
- Kaskutas, L., Ammon, L., & Weisner, C. (2003). A naturalistic comparison of outcomes at social and clinical model substance abuse treatment programs. *International Journal of Self Help and Self Care*, 2(2), 111-133.
- Kastukas, L., Greenfield, T. K., Borkman, T. J., & Room, J. A. (1998). Measuring treatment philosophy: A scale for substance abuse recovery programs. *Journal of Substance Abuse Treatment*, 15(1), 27-36. [http://dx.doi.org/10.1016/S0740-5472\(97\)00246-8](http://dx.doi.org/10.1016/S0740-5472(97)00246-8)
- Kelly, J. F., & White, W. L. (Eds.). (2011). *Addiction Recovery Management: Theory, research and practice*. New York, NY: Springer.
- Lam, J. A., Jekel, J. F., Thompson, K. S., Leaf, P. J., Hartwell, S. W., & Florio, L. (1995). Assessing the value of a short-term residential drug treatment program for homeless men. In G. J. Stahler, & B. Stimmel, *The effectiveness of social interventions for homeless substance abusers*, (pp. 21-39). Binghamton, NY: The Haworth Medical Press.
- Lawson, W., & Lawson, A. (2013). Disparities in mental health diagnosis and treatment among African Americans: Implications for the correctional Systems. *Crime, HIV and Health: Intersections of Criminal Justice and Public Health Concerns*, 81-91. http://dx.doi.org/10.1007/978-90-481-8921-2_4

- Lee, W. M., Blando, J. A., Mizelle, N. D., & Orozco, G. L. (2007). *Introduction to multicultural counseling for the helping professionals* (2nd ed.). New York, NY: Routledge Publishing.
- Levinson, D., & Ross, M. (Eds.). (2012). Homelessness in the past. In *Homelessness Handbook* (pp. 125-210). Barrington, MA: Berkshire.
- Maguire, M., Sheahan, T. M., & White, W. L. (2012). Innovations in Recovery Management for people experiencing prolonged homelessness in the city of Philadelphia “I want a new beginning”. *Alcoholism Treatment Quarterly*, *30*, 3-21.
<http://dx.doi.org/10.1080/07347324.2012.635548>
- Milby, J. B., Schumacker, J. E., Raczynski, J. M., Caldwell, E., Engle, M., Michael, M., & Carr, J. (1996). Sufficient conditions for effective treatment of substance abusing persons. *Drug and Alcohol Dependence*, *43*, 39-47. Retrieved from ac.els-cdn.com
- Miller, G. (2005). *Learning the language of addiction counseling*. Hoboken, NJ: Wiley.
- Mooney, A. J., Eisenberg, A., & Eisenberg, H. (1992). *The recovery book*. New York, NY: Workman Publishing.
- Moos, R. H., & Moos, B. S. (2007). Protective resources and long-term recovery from alcohol use disorders. *Drug and Alcohol Dependence*, *86*, 46-54.
[doi:10.1016/j.drugalcdep.2006.04.015](https://doi.org/10.1016/j.drugalcdep.2006.04.015)
- National Coalition for the Homeless. (2009). *Substance abuse and homelessness*. Retrieved from www.nationalhomeless.org

New York State Office of Alcoholism & Substance Abuse Services. (2010). *Addiction, homelessness and permanent supportive housing: How New York supports Individuals, families and communities in recovery*. Albany, NY: OASAS.

Nyamathi, A., Longshore, D., Galafi, E. R., & Leake, B. (2004). Motivation to stop substance use and psychological and environmental characteristics of homeless women. *Addictive Behaviors*, 29, 1839-1843. doi:10.1016/addbeh.2004.03.032

Oakley, D., & Dennis, D. L. (1996). Responding to the needs of homeless people with alcohol, drug and/or mental disorders. In J. Baumohl, *Homelessness in America*, (pp. 201-213). Phoenix, AZ: Oryz Press.

Obama administration issues rules requiring parity in treatment of mental, substance use disorders. (2010). Retrieved from <http://www.hhs.gov/news/press/2010pres/01/20100129a.html>

Orwin, R. G., Garrison-Morgren, R., Jacobs, M., & Sonnefeld, L. J. (1999). Retention of homeless clients in substance abuse treatment: Findings from the National Institute on Alcohol Abuse and Alcoholism Cooperative Agreement Program. *Journal of Substance Abuse Treatment*, 17(1-2), 45-66. doi:10.1016/S0740-5472(98)00046-4

Osborne, J. W. (2012). Logits and tigers and bears, oh my! A brief look at the simple math of logistic regression and how it can improve dissemination of results. *Practical Assessment, Research and Evaluation*, 17(11).

Peer-led services begin to emerge as adjunct to treatment. (2006, April 24th, 2006).

Alcoholism and Drug Abuse Weekly, 18(17), 1-3. Retrieved from ehis.ebscohost.com

- Room, J., Kaskutas, L., & Piroth, K. V. (1998). Brief overview of the social model approach. *Contemporary Drug Problems*, 25, 649-663. Retrieved from www.ebscohost.com
- Rosenblum, A., Nuttbrock, L., McQuiston, H., Magura, S., & Joseph, H. (2002). Medical outreach to homeless substance users in New York City: Preliminary results. *Substance Use and Misuse*, 8-10, 1269-1273. Retrieved from ehis.ebscohost.com
- Rowe, M., Fisk, D., Frey, J., & Davidson, L. (2002). Engaging persons with substance abuse disorders: Lessons from homeless outreach. *Administration and Policy in Mental Health*, 29, 263-273. Retrieved from springer.com
- Saloner, B., & Le Cook, B. (2013). Blacks and Hispanics are less likely than Whites to complete addiction treatment, largely due to socio economic factors. *Health Affairs*, 32(1), 135-145. <http://dx.doi.org/10.1377/hlthaff.2011.0983>
- Scott, C., & Dennis, M. (2011). Recovery management checkups with adult chronic substance users. In J. F. Kelly, & W. White (Eds.), *Addiction recovery management: Theory, research and practice*, (pp. 87-102). New York, NY: Springer.
- Seal, K. H., Bertenthal, D., Miner, C. R., Sen, S., & Marmar, C. (2007). Bringing the war back home: Mental health disorders among 103,788 US veterans returning from Iraq and Afghanistan seen at Department of Veterans Affairs facilities. *JAMA Internal Medicine*, 167, 476-482. doi:10.1001/archinte.167.5.476
- Shavelson, L. (2001). *Hooked : five addicts challenge our misguided drug rehab system*. New York, NY: The New Press.
- Stahler, G. J., Shipley, T. F., Bartelt, D., DuCette, J. P., & Shandler, I. W. (1995). Evaluating alternative treatments for homeless substance abusing men: Outcome and predictors

- of success. In G. J. Stahler, & B. Stimmel, *The effectiveness of social interventions for homeless substance abusers*, (pp. 151-167). Binghamton, NY: The Haworth Medical Press.
- Stahler, G., & Stimmel, B. (Eds.). (1995). Editorial: Social interventions for homeless substance abusers: Evaluating treatment outcomes. *The effectiveness of social interventions for homeless substance abusers*, (pp. xiii-xxiv). Binghamton, NY: the Haworth Medical Press.
- Stahler, G., & Stimmel, B. (Eds.). (1995). *The effectiveness of social interventions for homeless substance abusers* Binghamton, NY: The Haworth Medical Press
- Substance Abuse and Mental Health Services Administration. (2003). *Homelessness-provision of mental health and substance abuse services* (n.a.). Washington, DC: Government Printing Office.
- Substance Abuse and Mental Health Services Administration. (2006). *The DASIS Report: Homeless admissions to substance abuse treatment: 2004*. Retrieved from www.samsha.gov
- Substance Abuse and Mental Health Services Administration. (2009). *What are peer recovery support services?* (HHS Publication No. (SMA) 09-4454). Washington, DC: Government Printing Office.
- Substance Abuse and Mental Health Services Administration. (2011). *State estimates of substance use and mental disorders from the 2008-2009 national surveys on drug use and health* (HSDUH Series H-40, HHS Publication No. (SMA) 11-4641). Rockville, MD: Substance Abuse and Mental Health Services Administration.

- Substance Abuse and Mental Health Services Administration. (2011). *Treatment Episode Data Set (TEDS) 1999 - 2009*. Retrieved from www.samsha.gov
- The Betty Ford Institute Consensus Panel. (2007). What is Recovery? A working definition from the Betty Ford Institute. *Journal of Substance Abuse Treatment, 33*, 221-228.
- Tucker, J. S., Wenzel, S. L., Golinelli, D., Zhou, A., & Green, Jr., H. D. (2011). Predictors of substance abuse treatment need and receipt among homeless women. *Journal of Substance Abuse Treatment, 40*, 287-294. Retrieved from <http://dx.doi.org/prox.lib.ncsu.edu/10.1016/j.jsat.2010.11.006>
- U.S. Department of Health and Human Resources Substance Abuse and Mental Health Services Administration. (2006). *Client's handbook Matrix intensive outpatient treatment for people with stimulant use disorders*. Rockville, MD: SAMHSA.
- US Department of Health and Human Services-Substance Abuse and Mental Health Services Administration. (2009). *What are peer recovery support services?* ((SMA) 09-4454). Washington, DC: Government Printing Office.
- United Nations Office on Drugs and Crime. (2003). *Investing in drug abuse treatment: A discussion paper for policy makers* (n.a.). Washington, DC: Government Printing Office.
- Urschel, H. (2009). *Healing the addicted brain*. Napperville, IL: Sourcebooks, Inc..
- Vangeest, J. B., & Johnson, T. P. (2002). Substance abuse and homelessness: Direct or indirect effects? *Annals of Epidemiology, 12*, 455-461. Retrieved from www.annalsofepidemiology.org

- Velasquez, M. M., Crouch, C., Von Sternberg, K., & Grosdanis, I. (2000). Motivation for change and psychological distress in homeless substance abusers. *Journal of Substance Abuse Treatment, 19*, 395-401. doi:10.1016/S0740-5472(00)00133-1
- White, W. L. (2008). *Recovery management and recovery oriented systems of care: Scientific rationale and promising practices*. Rockville, MD: Substance Abuse and Mental Health Services administration's (SAMHSA) Center for Substance Abuse Treatment (CSAT).
- White, W. L. (2009). *Peer based addiction recovery support: History, theory, practice and scientific evaluation* [Research Report]. Philadelphia, Pa: Philadelphia Department of Behavioral Health and Mental Retardation Services.
- White, W. L., Boyle, M., & Loveland, D. (2002). Alcoholism/Addiction as a chronic disease: From rhetoric to clinical reality. *Alcoholism Treatment Quarterly, 20*(3-4), 107-129. doi:10.1300/J020v20n03_06
- White, W. L., & McClellan, T. A. (2008). Addiction as a chronic disease: Key messages for clients, families and referral sources. *Counselor, 9*(3), 24-33.
- White, W. L., & Sanders, M. (2004). Recovery management and people of color: Redesigning addiction treatment for historically disempowered communities. Retrieved from www.bhmr.org
- White, W. L., & Sanders, M. (2008). Recovery management and people of color: Redesigning addiction treatment for historically disempowered communities. *Alcoholism Treatment Quarterly, 26*, 365-395. doi:10.1080/07347320802072198

White, W. (n.d.). Recovery capital scale. Retrieved from

<http://www.williamwhitepapers.com/>

Witbrodt, J., Bond, J., Kaskutas, L., Weisner, C., Jaeger, G., Pating, D., & Moore, C. (2007).

Day hospital and residential addiction treatment: Randomized and nonrandomized managed care clients. *Journal of Consulting and Clinical Psychology, 75*(6), 947-959.
doi:10.1037/0022-006x.75.6.947

Wright, J. D., & Devine, J. A. (1995). Factors that interact with treatment to predict

outcomes in substance abuse programs for the homeless. In G. J. Stahler, & B.

Stimmel, *The effectiveness of social interventions for homeless substance abusers*,
(pp. 169-181). Binghamton, NY: The Haworth Medical Press.

Zerger, S. (2002). *Substance abuse treatment: What works for homeless people? A review of*

the literature [Research Report]. Nashville, TN: National HCH Council and HCH
Clinicians Network.

APPENDICES

Appendix A-- List of Dependent and Independent Variables with Valid Data Values

List of Dependent and Independent Variables with Valid Data Values

Variable	Description	Possible Values
Gender	Gender of client	Male Female
Age	Age of client at admission	Numeric: 18-99
Race	Race of Client	AA Caucasian Hispanic Native American Asian Bi-racial
Drug of Choice	Drug that the client uses on the most regular basis	Alcohol Crack Alcohol & Crack Heroin Marijuana Other Stimulant Other Opiate Poly Drug Use Other
Veteran Status	Has the client served in the military	Yes No
Age of first use	Age the client first used AODs	1 to Current Age
Years of use	The length of time between first use and admission	1 to Current Age
Return Client	Does the client have previous admissions to the recover program?	Yes No
Completion	Dependent Variable: Did the client complete the recovery program in good standing?	Yes No

Appendix B-Data Cleaning

1. Updated New/Return list based on look-up of previous records.
2. Added Gender.
3. Changed “Siver Chip” to “Silver Chip.
4. Removed following records due to invalid data: 311, 1643 and 1714.
5. Updated cases 1458 and 1758 to show Highest Level Reached as OTS 1 based on Length of Stay.
6. Changed at of one client from 93 to 39.
7. Removed Age of First Use from cases: 1106, 1130, 22, 43 and 1188 due to invalid data.
8. Deleted Age of First Use for cases: 17, 21, 32, 35, 65, 79, 99, 110, 126, 127, 146, 163, 221, 337, 390, 393, 425, 439, 493, 510, 512, 606, 820 and 904.

Appendix C--Descriptive Statistics

Table 13

Descriptive Statistics of Categorical Variables

Variable	Value	Frequency	Valid Percent	Number Completing	Completion Percent
Gender	Female	674	38.34	34	5.04
	Male	1084	61.66	117	10.79
	Total	1758	100.00	151	8.59
Race	AA	705	40.10	48	6.81
	Asian	2	0.11	0	0.00
	Bi-racial	2	0.11	0	0.00
	Caucasian	1001	56.94	99	9.89
	Hispanic	35	1.99	2	5.71
	Native American	13	0.74	2	15.38
	Total	1758	100.00	151	8.59
Race Group	AA	657	37.37	48	7.31
	Caucasian	902	51.31	99	10.98
	Other	48	2.73	4	8.33
	Total	1758	100.00	151	8.59
New/Return Client	Return Client	442	25.14	35	9.92
	New Client	1316	74.86	116	8.81
	Total	1758	100.00	151	8.59
Veteran Status	Non-Veteran	1606	91.35	125	7.78
	Veteran	152	8.65	26	17.11
	Total	1758	100.00	151	8.59
Age Group	18-25 Years Old	288	16.38	10	3.47
	26-39 Years Old	635	36.12	43	6.77
	40-49 Years Old	604	34.38	63	10.43
	>49 Years Old	231	13.14	35	15.15
	Total	1758	100.00	151	8.59
Drug of Choice	Alcohol	271	15.42	26	9.59
	Alcohol & Crack	484	27.53	37	7.64
	Crack	123	7.00	6	4.88
	Heroin	14	0.80	0	0.00
	Marijuana	11	0.63	0	0.00
	Other Opiate	9	0.51	0	0.00
	Other Stimulant	4	0.23	0	0.00
	Poly Drug Use	842	47.90	82	9.74
	Total	1758	100.00	151	8.59

Table 13 - continued

Drug of Choice Group	Alcohol	271	15.42	26	9.59
	Crack	123	7.00	6	4.88
	Alcohol and Crack	484	27.53	37	7.64
	Poly Drug Use	842	47.90	82	9.74
	Other	38	2.16	0	0.00
	Total	1758	100.00	151	8.59
Age of First Use Group	<11 Years Old	221	11.91	17	7.69
	11-17 Years Old	1223	55.35	113	9.24
	18-20 Years Old	147	28.17	8	5.44
	>20 Years Old	138	4.57	12	8.70
Total (Non Missing)		1729		150	7.77
Missing		29	100.00	1	3.45
Total		1758		151	8.59
Length of Use Group	0-10 Years	296	17.12	13	4.39
	11-20 Years	410	23.71	23	5.61
	21-30 Years	501	28.98	52	10.38
	>30 Years	522	30.19	62	11.88
Total (Non Missing)		1729	100.00	150	8.06
Missing	System	29		1	3.45
Total		1758		151	8.59

Table 14

Descriptive Statistics of Continuous Variables

Variable	N	Minimum	Maximum	Mean	SD	Skewness	Kurtosis
Age (Years)	1758	18	74	37.81	10.58	-0.03	-0.77
Age of 1st Use (Years)	1729	4	45	14.63	4.72	1.73	7.01
Length of Use (Years)	1729	0	60	23.18	10.92	0.01	-0.80
Valid N (listwise)	1729						

Appendix D-- IRB Approval

NC STATE UNIVERSITY

North Carolina State University is a land-grant university and a constituent institution of the University of North Carolina

Office of Research and Innovation
Division of Research Administration

Campus Box 7514
Raleigh, North Carolina 27695

919.515.2444 (phone)
919.515.7721 (fax)

From: Deb Paxton, IRB Administrator
North Carolina State University
Institutional Review Board

Date: November 9, 2012

Title: Recovery factors dissertation

IRB#: 2920

Dear David Fitzpatrick

The research proposal named above has received administrative review and has been approved as exempt from the policy as outlined in the Code of Federal Regulations (Exemption: 46.101. b.4). Provided that the only participation of the subjects is as described in the proposal narrative, this project is exempt from further review.

NOTE:

1. This committee complies with requirements found in Title 45 part 46 of The Code of Federal Regulations. For NCSU projects, the Assurance Number is: FWA00003429.
2. Any changes to the research must be submitted and approved by the IRB prior to implementation.
3. If any unanticipated problems occur, they must be reported to the IRB office within 5 business days.

Please forward a copy of this letter to your faculty sponsor, if applicable.

Thank you.

Sincerely,



Deb Paxton
NC State IRB