

The Relationship between Pill Sharing Networks and Abuse of Opiate Pain  
Relievers

by

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*I dedicate this research to my personal angels. I love you MaDea and Daddy.*

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## ABSTRACT

Extended research on prescription drug abuse is limited, specifically surrounding opiate pill source. The purpose of the current research study is to examine if people who receive opiate prescription pills from friends use more opiate prescription pills per month than people who receive them from other sources and doctors. A sample size of 1,462 opiate prescription abusers was drawn from the 67,804 participants who participated in the 2010 National Survey on Drug Use and Health (NSDUH). The relationship between opiate prescription pill use and source of pills was examined. People who obtain pills from other sources significantly used opiate pills on more days than those who got pills from friends or doctors. Opiate usage did not differ by gender or age. Usage was higher for people in treatment for emotional/mental distress than for those not in treatment. Future research into additional prescription opiate pill abuse sources is necessary. The development of interventions to reduce opiate pill diversion is also recommended.

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## CHAPTER ONE: INTRODUCTION

The problem of prescription drug abuse has created an enormous financial burden and significant health concerns in the United States (Worley, 2012). The prevalence and type of health consequences vary depending on age, gender, race, ethnicity, geography, socioeconomic factors, and diagnosed medical conditions. Healthy People 2020 listed addressing of non-medical use of prescription drugs as a health priority for the US (United States Department of Health and Human Services, 2012).

The United States is in the midst of a prescription painkiller overdose epidemic (Prescription Painkiller, 2014). Every day, 44 people in the United States die from prescription painkiller overdose and many more become addicted (About the Epidemic, 2015). Drug abuse is a serious public health problem that affects almost every community and family in some way. Each year, drug abuse causes millions of serious illnesses or injuries among Americans (About the Epidemic, 2015).

Prescription drug abuse is the fastest-growing drug problem in the Nation. In 2007-2008, Tennessee ranked first among all states for past-year non-medical use of pain relievers among persons age 26 or older (Tennessee Drug Control, 2015). Resulting from the above statistics Tennessee Department of Health established a database to monitor the dispensing of Schedule II, III, IV & V

controlled substances. Data collection began for all dispensers on December 1, 2006 (Controlled Substance Monitoring, 2012).

As a result of the statistics Tennessee developed a doctor shopping bill that states, “a patient must disclose to a prescriber (physician, nurse practitioner, dentist, podiatrist, or optometrist) that he/she has received the same controlled substance or one with similar therapeutic use from another practitioner within 30 days” (Worley, 2012).

According to the 2009 National Survey on Drug Use and Health, among people age 12 or older who reported using pain relievers non-medically in the past year, 70 percent got the drugs from a friend or relative (either for free, purchased, or by theft). Another 18 percent reported getting the drug from one doctor. Only about 5 percent reported obtaining pain relievers from a drug dealer or other stranger, and less than half of one-percent bought the drugs on the Internet (A Response to the Epidemic, 2011).

Prescription opiate abuse is not rare, SAMHSA statistics suggest that of those abusing pain relievers most (ca. 70 %) got them illicitly. Less than 20% got the drugs directly through a prescription from a doctor. This suggests that while diversion and illicit use is real, the great majority of individuals abusing opioids (usually young people) are getting ‘high’ taking grandma's Oxycontin, stealing it or buying it from their friends or relatives and do not get them by prescription from an MD (Fields, 2011).

A vast amount of positive research in the field of substance abuse has been successfully conducted. However, limited research exist on opiate prescription pill use and opiate pills source. The gap in research has revealed a lack of knowledge on the subject. A detailed description of definitions along with the research question will be provided. The purpose of the study is to examine the relationship between opiate prescription pill use and opiate pills source.

### **Research Question**

When controlling for age, sex, and treatment for emotional distress, what effect do sources of opiate prescription pills have on the number of days that individuals use opiate prescription pills per month?

### **Hypothesis**

When controlling for age, sex, and treatment for emotional distress, individuals who obtain opiate prescription pills from friends and associates use more opiate prescription pills than people who obtain opiate prescription pills from physicians or other sources.

### **Summary**

Overdose deaths due to prescription opioid pain relievers have more than tripled in the past 20 years, escalating to 16,651 deaths in the United States in 2010. Opioids account for the greatest proportion of the prescription drug abuse problem (Volkow, 2014).

Limited information is available that explains how and why people obtain pills from other sources. The focus of this study is to examine if people who receive opiate prescription pills from friends use more opiate prescription pills per month than people who receive them from other sources and doctors.

## **CHAPTER TWO: LITERATURE REVIEW**

Data from the National Survey on Drug Use and Health (NSDUH 2014) indicates that 4.3 million Americans engaged in non-medical use of prescription painkillers in month preceding the survey and 1.4 million people used prescription painkillers non-medically for the first time in the past year. Average age of initiation of prescription painkiller use is 21.2 years (SAMHSA, 2014).

The review of the literature is intended to provide relevant background information on substance abuse in the United States. Statistics on prescription drug abuse, individuals and prescription drug abuse, doctor shopping and pill mills, substance abuse, prescription drug monitoring programs, related research on prescription network sharing, emotional distress, and theoretical framework will be examined.

### **Prescription Drug Abuse**

Data from the National Survey on Drug Use and Health (NSDUH 2010) show that nearly one-third of people aged 12 and over who used drugs for the first time in 2009 began by using a prescription drug non-medically (Office of National Drug Control Policy, 2011).

The lack of public education on the dangers of prescription drug abuse may lead many people to mistakenly believe that prescription drugs are safer than illicit drugs because they are prescribed by a healthcare professional and

dispensed by a pharmacist. Parents must educate their children about the dangers inherent in abusing prescription drugs. Addressing the prescription drug abuse epidemic is a top priority for public health. It will also help build stronger communities and allow those with substance abuse disorders to lead healthier, more productive lives (A Response to the Epidemic, 2011).

### ***Prescription Drug Overdose***

There are numerous classes of prescription drugs currently being abused in the United States. Opiate abuse is the fastest growing substance and is highly preferred by substance abusers and most deadly (Manchikanti, Fellow, Ailinani, & Pampati, 2010). Opiate drug overdoses once attributed to heroin abuse have been replaced by opiate prescription abuse. The Centers for Disease Control and Prevention (2010) found that deaths from opioid poisoning or overdose have tripled from 1997 to 2007 (CDC, 2010).

The Centers for Disease Control and Prevention has classified prescription drug overdoses as an epidemic. Drug overdose deaths, driven largely by prescription drug overdose deaths, are now the leading cause of injury death in the United States surpassing motor vehicle crashes ([www.fda.gov](http://www.fda.gov)). Additionally, the overall drug overdose death rate in the United States roughly tripled between 1991 and 2011, and in 2007 about 100 people per day died from drug overdoses in the U.S. (FDA Takes Action, 2013).

### ***Number of Opiate Pills Taken***

The length of time in addiction and the number of opiate pills taken daily contribute to the severity of addiction. The more years of abuse, the higher the tolerance level. The number of persons aged 50 or older abusing prescription drugs is projected to increase 190 percent over the next two decades, from 911,000 in 2001 to almost 2.7 million in 2020 (Colliver, Compton, Gfroerer, & Condon, 2006).

Drug overdoses from prescription opioids in 2008 exceeded those for cocaine and heroin combined. Research shows that people who misuse opioids often obtain them through a legitimate prescription to treat pain or a medical condition. In this case misuse may constitute taking more than prescribed. The most commonly misused prescription drugs fall within the class of controlled substances termed opioid pain relievers, such as hydrocodone and oxycodone (Wartell & La Vigne, 2012)

National Survey on Drug Use and Health (2009) found an increase in opiate pill consumption. From 1997 to 2007 the total milligram per person use of prescription opioids in the United States (U.S.) increased from 74 milligrams to 369 milligrams which is an increase of 403 percent. Additionally, in the year 2000, retail pharmacies dispensed 174 million prescriptions for opioids. By 2009, 257 million prescriptions were dispensed, an increase of 48 percent (NSDUH, 2009).



## **Participation in a Pill Sharing Network**

To participate in the pill sharing network the abuser should possess the ability to obtain opiate prescriptions from several doctors in order to contribute to the network (National Institute on Drug Abuse, 2011).

### ***Facts Surrounding Participation in Pill Sharing Networks***

Numerous factors contribute to the prescription drug problem. These include social acceptability for using medications for different purposes, strategic marketing by pharmaceutical companies, and the rise in opiate prescriptions written (America's Addiction to Opioids, 2014). Together all of the above facts create what is known as the broad "environmental availability" of prescription drugs (America's Addiction to Opioids, 2014). The Department of Health and Human Services (2008) indicated prescriptions for opiates such as hydrocodone and oxycodone products have escalated from around 40 million in 1991 to nearly 180 million in 2007 with the U.S. as the biggest consumer. The U.S. supplied 99 percent of the world total for hydrocodone (e.g. Vicodin) and 71 percent of oxycodone (e.g. OxyContin) (Scientific Research, 2008).

Pill sharing networks often include the buying and selling of opiate prescription drugs in order to continue usage. Studies have found that people who sell prescription drugs often visit numerous clinics to obtain large amounts of prescription drugs, sponsor others to obtain prescription drugs, and buy prescription drugs from vulnerable people such as veterans, the elderly, people

on Medicare or Medicaid, or those with HIV/AIDS (Inciardi et al., 2009; Rigg, Kurtz, & Surratt, 2012).

Fountain et al., (1997) indicated “To obtain drugs surplus to their own requirements in order to sell them on the illicit market they acquired more than one prescription (‘multiple scripting’) and/or obtained a prescription for a higher dosage and/or a wider variety of drugs than they intended to use themselves (‘overscripting’). Informants exploited the lack of a standardized prescribing policy, by ‘doctor shopping’. They searched out physicians most likely to prescribe the drugs and the quantity they wanted” (p. 159-167).

### **Women and Prescription Drug Abuse**

Substance use is a growing problem among women. The 2009 National Survey on Drug Use and Health (NSDUH) reported that approximately 6.6% of women aged 12 and older reported past month use of an illicit drug (Results from the 2013, 2014).

Certain risk factors may make the female population vulnerable to substance use disorders. Women have become prime targets for prescription drug abuse due to high stress levels and numerous physical health problems (Cicero et al., 2011). “People who abuse prescription drugs and engage in diversion tactics are viewed differently by researchers according to gender” (Worley, 2013).

Deaths from prescription painkiller overdoses among women have increased more than 400% since 1999, compared to 265% among men. About 18 women die every day of a prescription painkiller overdose in the US, more than 6,600 deaths in 2010. Prescription painkiller overdoses are an under-recognized and growing problem for women (CDC, 2013).

Cicero et al., (2011) found that women are more likely to use doctors' prescriptions for abuse and/or engage in doctor shopping than men. Prescribers appear to be more sympathetic toward women when it involves pain, making prescription drugs more accessible.

### **Source for Obtaining Prescription Drugs**

The Substance Abuse and Mental Health Services Administration states that in the past year nonmedical users of psychotherapeutic drugs were asked how they obtained their most recent nonmedical drugs. Rates averaged across 2012 and 2013 show that more than half of the nonmedical users of pain relievers, tranquilizers, stimulants, and sedatives aged 12 or older got the prescription drugs they most recently used "from a friend or relative for free." More than four in five of these nonmedical users who obtained prescription drugs from a friend or relative for free indicated that their friend or relative had obtained the drugs from one doctor (SAMHSA, 2014).

## **Doctor Shopping**

Doctor shopping is the most widely used method of diversion of prescription drugs (United States Department of Justice, 2009). Pill sharing networks involves doctor shopping. The term “doctor shopping” has traditionally referred to obtaining controlled substances from multiple health care providers without the prescribers’ knowledge of the other written prescriptions (CDC, 2012).

Worley & Hall (2012) wrote that doctor shopping occurs when, “a) a patient receives a prescription for the same or similar controlled drug for illicit use, from more than one prescriber within a 30-day day period, b) from three or more pharmacies, c) wherein the patient does not inform the prescriber of previous controlled prescriptions or the prescriber is aware and unscrupulously prescribes, as well as or when, a patient visits five or more prescribers within a one-year period for controlled drugs for illicit use” (p. 262-278.)

The United States National Drug Intelligence Center (2004) defines doctor shopping as the extent to which an individual visits numerous doctors in an attempt to obtain multiple prescriptions for drugs, often falsifying or exaggerating symptoms in order to receive these prescriptions, and typically have their prescriptions filled at multiple pharmacies in order to avoid detection.

The United States government as well as researchers have used the criterion of the use of five or more medical practitioners in one year as a measure

for doctor shopping (Hall, et. al., 2008; U.S. Government Accountability Office, 2011).

The Tennessee Department of Mental Health and Substance Abuse Services (2012) reported that hydrocodone accounts for 36 percent of the top 10 prescriptions filled. Doctor shopping is a key component in a pill sharing network. To participate in the pill sharing network the abuser should possess the ability to obtain opiate prescriptions from several doctors in order to contribute to the network (National Institute on Drug Abuse, 2011).

Recent data demonstrate that doctor shopping is an area of concern in Tennessee. In March 2013, 2,010 people received prescriptions for opioids or benzodiazepines from four or more prescribers. Additionally, data from the Department of Corrections indicates that people are being convicted for doctor shopping. From January to September of 2013, 153 individuals were convicted of doctor shopping, which surpasses the 2012 total of 136 people convicted. As utilization of the Controlled Substance Monitoring Database has increased, the number of people known to be doctor shopping has decreased (Tennessee Department of Health, 2013).

The Government's Fiscal Year 2011 Budget request proposes funding for a program to train prescribers on how to instruct patients in the proper use and disposal of painkillers, to observe signs of dependence, and to use prescription drug monitoring programs to detect when individuals are going from doctor-to-

doctor (“doctor shopping”) in search of prescriptions (“A Response to the Epidemic, 2011).

### **Prescription Drug Monitoring Programs**

Drug abusing behavior stems from an increase in tolerance for drugs creating a dependency on narcotic prescriptions and developing an addiction over time. The misuse and abuse of narcotic prescriptions, particularly opiates, has been attributed to their increased availability over the last decade a result of increased prescribing (The Prescription Drug Abuse, 2013).

Prescription Drug Monitoring Program’s (PDMP) are electronic databases used by state law enforcement to track the abuse and misuse of prescription drugs. PDMP are electronic databases run by individual states so that prescribers can access information on controlled drug prescription histories of patients (Worley, 2012).

Diversion of prescription drugs (the unlawful use of illicit drugs for illicit purposes) is another issue addressed by Prescription Drug Monitoring Programs. In some states the Prescription Drug Monitoring Programs has reduce the rate of deaths by overdose from opiate use (Delcher, 2014).

The increasing incidence of doctor shopping prescribing controlled drugs has increased 127% between 1997 and 2006 (Manchikanti & Singh, 2008). This increase has occurred despite the development of Prescription Drug Monitoring Program.

## **Diversion of Prescription Drugs**

According to the Drug Enforcement administration (DEA) prescription drug diversion is becoming an industry that generates approximately \$25 billion each year. This include manufacturing, distribution, prescribers, pharmacies, and the patients (Inciardi et al., 2010). Diversion of prescription drugs consist of several components: sharing prescriptions with others not for medical purposes (networking), visiting multiple doctors for opiate prescriptions “doctor shopping,” altering prescriptions by patients or healthcare providers including physicians, and theft of prescription pads (Inciardi, et al., 2010).

The illegal selling of prescription drugs by internet is also included in the diversion process. “Risk of abuse misuse and diversion of opioids are a concern. Obtaining opioid prescriptions from multiple prescribers known as opioid shopping is a way in which opioids may be abused and diverted” (Cepeda et al., 2012, p. 325-334).

## **Other Related Research on Prescription Sharing**

Bimbaum conducted a study that evaluated the cost of opiate abuse to be an estimated \$55.7 billion in 2007. This study focused on claims surrounding the dependence and misuse of opiates. The final amount included costs from the workplace, healthcare and criminal justice system (Birnbaum et al., 2011).

A three-year study on women and young girls (aged 8–22) revealed that girls and young women use substances for different reasons than boys and

young men. The study found that risk factors such as low self-esteem, peer pressure, and depression make girls and young women more vulnerable to substance use as well as substance use disorders, in that females become dependent faster and suffer the consequences sooner, compared to males (National Center on Addiction and Substance Abuse at Columbia University, 2003).

Educating prescribers on substance abuse is critically important, because even brief interventions by primary care providers have proven effective in reducing or eliminating substance abuse in people who abuse drugs but are not yet addicted to them. In addition, educating healthcare providers about prescription drug abuse will promote awareness of this growing problem among prescribers so they will not over-prescribe the medication necessary to treat minor conditions (Epidemic: Responding, 2011).

### **Emotional/Mental/Treatment Distress**

The Diagnostic Statistical Manual states that mental disorders are usually associated with significant distress or disability in social occupational or other important activities. An expected and culturally approved response to a common stressor or loss is not a mental disorder (DSM-5, 2013).

Stress has long been known to increase vulnerability to addiction. The last decade has led to a dramatic increase in understanding the underlying mechanisms for this association (Sinha, 2008).



According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) a mental disorder is a syndrome characterized by clinically significant disturbance in an individual's cognition emotion regulation or behavior that reflects a dysfunction in the psychological biological or developmental processes underlying mental functioning. Socially deviant behavior or conflict between the individual and society are not mental disorders unless the deviance or conflict results from a dysfunction in the individual (DSM-5, 2013).

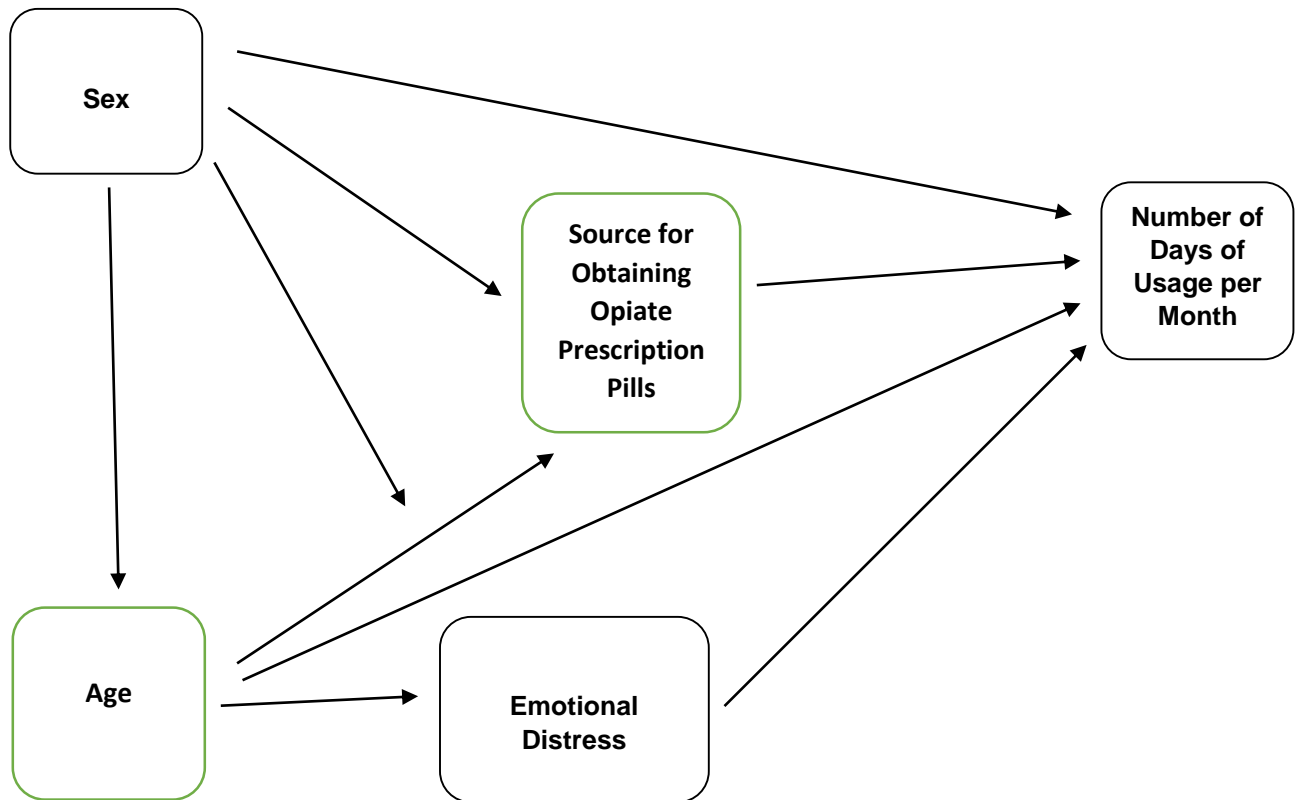
### **Theoretical Focus**

There are many theories that researchers use to examine addiction and substance abuse. Biological, personality, cognitive, behavioral and social network theories are the main categories used as guiding frameworks for this type of research. Other earlier theories were developed from Freudian views including the idea that substance abuse occurred due to a disorder within psychological structures. Drugs were viewed as a substitute for gratification of oral and genital needs (Vetter, 1985).

Social network theory applies to several levels of analysis that range from small groups to larger systems. In social network analysis literature, nodes are often individuals or collectives of individuals (e.g., corporate boards, families, organizations, nations). The ties interconnect through shared endpoints to form paths that indirectly link nodes that are not directly tied. The pattern of ties in a network yields a particular structure, and nodes occupy positions within this structure (Borgatti & Halgin, 2011).

Social Network Theories and Social Support examines the influence of social relationships. How participants in a network interact with one another and the world outside their network. Looking at distances between two or more members of nodes within networks, the closeness, and the degree of interaction taken place in the network.

Social network variables. Personal network characteristics were assessed using an egocentric approach that examines the network members (alters) reported by the respondent (ego). The ego-alters connection is described from the point of view of the ego, this approach focuses on the relationships directly surrounding the ego (Marsden, 2006).



*Figure 1. Path Model*

#### Prescription Drug Abuse and Opiate Pill Source

*Figure 1.* Illustrates the path model of the effect people's sources of obtaining opiate prescription pills have on the number of days that they use opiate prescription pills per month. Variables sex, age, emotional distress, and source for obtaining opiate prescription pills.

## **Historical Viewpoints on Substance Abuse**

Drug abuse has been a part of history dating back to well over a 150 years in the United States. There were Opium Wars in the early 19th century (Kandall, 2010). Many immigrants used opium to alter their mood and escape from cultural changes and inhumane living conditions. Distribution of opium and morphine was legal and placed in medication and several food products during this period of time. A prescription was not needed and many people developed habits. The Federal Pure Food and Drug Act was passed in 1906 which required medicines and foods containing opiates to be labeled as such. The Harrison Anti-Narcotic Act was passed in 1914 which criminalized illicit drug use (Kandall, 2010). Prescription medications with abuse potential were designated as controlled drugs in 1970 by the Controlled Substance Act (National Conference of Commissioners on Uniform State Laws, 2012).

“Drug-related overdoses have also dramatically increased in Tennessee. From 1999 to 2010, the number of people dying from drug-related overdoses increased at a greater rate in Tennessee than in the United States. While there has been an increase of 127% nationwide, (16,849 deaths in 1999 to 38,329 in 2010), in Tennessee<sup>23</sup> there has been a 210% increase, (342 in 1999 to 1,059 in 2010), in the number of drug overdose deaths<sup>24</sup>. In 2012, there were 1,094 drug related overdose deaths in Tennessee” Tennessee Department of Mental Health

## **Summary**

Participation in pill sharing networks is rapidly increasing across the United States. This includes obtaining opiate prescriptions from friends and associates, and doctor shopping acquiring multiple narcotic prescriptions which are abused or sold for profit. Very limited information pertaining to pill sharing networks is available.

Women are prime target for narcotic medication consumption for numerous reasons previously mentioned. There are many topics that are not understood about women engaging in pill sharing networks, such as how or if prescribers are specifically targeted, is public or private health insurance used, and if the narcotic medication that is being sought is for pleasure and or pain. These are question that can be explored during research to help prescribers make better decisions when prescribing narcotic medications. Understanding this information can lead to the development of a model about pill sharing networks and how to decrease prescription drug abuse?

## **Research Question**

When controlling for age, sex, and treatment for emotional distress, what effect does sources of opiate prescription pills have on the number of days that individuals use opiate prescription pills per month?

**Hypothesis**

When controlling for age, sex, and treatment for emotional distress, individuals who obtain opiate prescription pills from friends and associates use more opiate prescription pills than people who obtain opiate prescription pills from physicians or other sources.

## CHAPTER THREE: METHODOLOGY

This section provides a description of the population, sample, research design, data collection and analysis plan.

### **Data Source**

The target population consist of 67,804 participants from the 2010 National Survey on Drug Use and Health (NSDUH). For this research study 1,462 participants were sampled out of the 67,804 from the 2010 NSDUH (ages 18 or older) who reported prescription drug use. All participants were interviewed only once and were not followed for additional interviews in subsequent years i.e., cross-sectional.

The 2010 NSDUH design allows for computation of estimates by State in all 50 States plus the District of Columbia. States may therefore be viewed as the first level of stratification as well as a reporting variable. Eight States, referred to as the large sample States, had a sample designed to yield 3,600 respondents per State for the 2010 survey.

This sample size was considered adequate to support direct State estimates. The remaining 43 States (which include the District of Columbia) had a sample designed to yield 900 respondents per State in the 2010 survey. In these 43 States, adequate data were available to support reliable State estimates based on small area estimation (SAE) methodology (National Survey on Drug Use and Health, 2010).

## **Selection of Survey Participants**

During each quarterly survey, field interviewers visited each sample address to determine dwelling unit eligibility, to list all eligible persons at the address, to select the sample of persons to be interviewed, and to conduct interviews. In addition, the interviewers followed special "halfopen" interval procedures to identify any new (since the time of listing) housing units or any dwelling units missed during the advance listing process. "Any new or missed dwelling units following immediately after a sample dwelling unit and up to, but not including, the next initially listed address in the prescribed order of listing also were included in the sample" (NSDUH, 2010).

The interviewers used a handheld computer to record the results of the dwelling unit screening process and to select the sample of respondents. They recorded the results of each call, the final eligibility status of the dwelling unit, and information on new and missed dwelling units. If a sample address was an eligible occupied dwelling unit, they also conducted a screening interview to identify and roster all survey-eligible persons residing at the address. When the roster was complete, the computer was programmed to select the sample of persons to be interviewed using parameters specified for that area segment and a random number specified for that address (NSDUH, 2010).

Data collection progress was monitored during each quarterly survey by State. Small reserve samples were held back each quarter so that the assigned



sample size could be adjusted if necessary during the course of data collection (NSDUH, 2010).

### **Selection of Dwelling Units**

The sample design required an approximately equal number of persons in three age groups: 12 to 17 years, 18 to 25 years, and 26 years or older. To improve the precision of the estimates, the sample allocation process targeted five age groups: 12 to 17 years, 18 to 25 years, 26 to 34 years, 35 to 49 years, and 50 years or older. Here, the allocation among the three age groups in the 26 years or older group was done in such a way as to increase precision while maintaining approximately the same sample size as the 12 to 17 and 18 to 25 age groups. The size measures used in selecting the area segments were coordinated with the dwelling unit and person selection process so that a nearly self-weighting sample could be achieved in each of the five age groups. Departures from the self-weighting objective occurred for several reasons, including the following (NSDUH, 2010).

The fieldwork for the 2010 NSDUH was directed by Research Triangle Institute (RTI) staff members. RTI maintained a field staff of approximately 700 Field Interviewers (FI) to collect the data. As noted above, a total final sample of 67,804 computer-assisted interviews (CAI) was obtained for the 2010 survey. Strategies for ensuring high rates of participation resulted in a weighted screening response rate of 88.42 percent and a weighted interview response rate for the CAI of 74.57 percent (NSDUH, 2010).

## **Measures/Instruments**

The National Survey on Drug Use and Health, 2010 (NSDUH) developed a questionnaire to measure the prevalence and correlates of drug use in the United States. This survey provides information on the use of illicit drugs, alcohol, and tobacco among members of the noninstitutionalized U.S. civilian population age 12 years and older (NSDUH, 2010).

Computer-assisted interviews (CAI), and audio computer-assisted self-interviews (ACASI) were conducted by field interviewers. The use of ACAI provides participants with highly private and confidential means for responding to questions and to increase the level of honesty reporting illicit drug use and other sensitive behaviors (NSDUH, 2010).

The files are available as an ASCII file with 3,128 variables and 57,313 observations. Three program files are made available to read the ASCII file into SAS, SPSS, and Stata. The file also is made available as a SAS transport (CPORT) file SPSS system file, Stata system file, and ASCII tab-delimited file. All of the data and program files are available from SAMHSA (NSDUH, 2010).

## **Analysis Plan**

Data are analyzed using SPSS and One-Way Analysis of Variance. Interactions between source of prescription drugs and the control variables are tested.

## **Ethical Issues**

Throughout the course of the study, participant's anonymity and the privacy of responses were protected by separating identifying information from survey responses. Participants were assured that their identities and responses would be handled in strict compliance with Federal law.

As discussed above, the questionnaire itself and the interviewing procedures were designed to enhance the privacy of responses, especially during segments of the interview in which questions of a sensitive nature were posed. Answers to sensitive questions were gathered using audio computer-assisted personal interviewing (ACASI). During the ACASI portions of the interview, respondents listened to prerecorded questions through headphones and entered their responses directly into a computer without interviewers knowing how they were answering (NSDUH, 2010).

At the conclusion of the ACASI section, the interview returned to the computer-assisted personal interviewing mode with the interviewer completing the questionnaire. Each respondent who completed a full interview was given a \$30 cash payment as a token of appreciation for his or her time (NSDUH, 2010).

## **Limitations**

NSDUH is the only study that annually produces estimates of drug use among civilian members of the noninstitutionalized population in the United States. The survey is an appropriate technique for estimating prevalence

estimates for use of different drugs because most drug use would not ordinarily come to the attention of administrative, medical, or correctional authorities and therefore would not be included in official statistics. In-person interviews with a large national probability sample seem to be the best way to estimate drug use in virtually the entire population of the United States (NSDUH, 2010).

Although NSDUH is useful for many purposes, it has certain limitations. First, the data are self-reports of drug use, and their value depends on respondents' truthfulness and memory. Although some experimental studies have established the validity of self-reported data in similar contexts and NSDUH procedures were designed to encourage honesty and recall, some underreporting and overreporting may take place (NSDUH, 2010).

Social network theory was mentioned in this study, however no networks were researched. This study only looked at sources which people obtained opiate prescription pills. An ego-centric approach was used in the questionnaire.

## **Variables**

### ***Independent variable(s)***

The independent variable in the study is source for obtaining opiate prescription pills. The independent variable will be measured by the responses to the statements below on the NSDUH survey.

- I got pain relievers from friends and other relative.
- I got the pain relievers in some other way.

- I got prescriptions for pain relievers from two or more doctors.

***Dependent variable(s)***

The dependent variable, number of opiate pills taken per month will be measured by the responses to the statements below from the NSDUH survey.

- The number of days per month used pain relievers in the past twelve months.

***Control variable(s)***

The control variable emotional and mental distress treatment will be measured by the responses to the statements or questions below. The remaining control variables effect outcome expectancies as well pertaining to the source for number of opiate pills taken per month.

- Emotional/mental/treatment distress

How severe was emotional distress during the last two weeks?

Emotional distress was so severe nothing could cheer you up.

Emotional distress was so severe could not do daily activities.

- Age
- Sex

## **CHAPTER FOUR: RESULTS**

In this study we use data from the 2010 National Survey on Drug Use and Health to study opiate pill use. When controlling for age, sex, and treatment for emotional distress, individuals who obtain opiate prescription pills from friends and associates use more opiate prescription pills than people who obtain opiate prescription pills from physicians or other sources.

### **Descriptive Statistics**

Table 1 shows descriptive statistics for questions from the 1,462 participants. There were more men (54.24%) than women in the sample. The days per month pain relievers were used over a 12 month period had a mean of 7.3 with a standard deviation 7.32. The majority of participants (68.26%) got opiate pills from friends, 17.40% got pills from doctors, and 14.34% got pills from other source. People who reported getting opiate pills from other sources, used an average of 10.11 pills per month compared to those who got the pills through doctors (7.70).

Table 1

*Descriptive Statistics, 2010 NSDUH (N = 1,462)*

| Characteristic                                   | <i>M</i> | <i>SD</i> |
|--|----------|-----------|
| Days Per Month Used Pain Reliever Last 12 Months | 7.32     | 7.32      |
|  | <i>n</i> | <i>%</i>  |
| Prescription Drug Source                         |          |           |
| Friends  | 951      | 68.26     |
| Other Sources                                    | 201      | 14.34     |
| Doctor   | 244      | 17.40     |
| Emotional/Mental/Treatment Distress              |          |           |
| Treatment  | 486      | 35.00     |
| No treatment                                     | 903      | 65.00     |
| Age  |          |           |
| 18 to 25   | 1,022    | 69.91     |
| 26 to 34   | 223      | 15.25     |
| 35 Years and older                               | 217      | 14.84     |
| Gender   |          |           |
| Men  | 793      | 54.24     |
| Women  | 669      | 45.76     |

## Days of Opiate Pill Use

Table 2 represents ANOVA results including the dependent variable: In the main effects model, 2.9% of the variation in days of use is explained,  $F(6, 1382) = 6.763, p < .001$ . Regression Post Hoc test shows a significant difference (2.412,  $p = .001$ ) in estimated marginal mean between other sources of drugs and doctors. There is no difference in the number of days opiate pills are taken per month when the source is friends (EMM = 6.757) and when the source is doctors (EMM = 7.697). Days per Month Used Pain Relievers Last 12 Months. The Tukey Post Hoc test (performed at the 0.05 level of significance) examined the estimated marginal means and determined that there was a statistically significant difference in the mean scores in other sources and doctor sources (the reference group). Interactions between prescription drug source and other independent variables was tested and found not to be significant. The results for prescription drug source indicate that at the  $p = .001$  level of significance, there was at least one mean that was different from the rest. Specifically, persons who use other sources for obtaining prescription drugs ( $M = 10.11, SE = 0.55$ ) have higher usage than the doctors reference group ( $M = 7.70, SE = 0.48$ ). This result is significant,  $F(2, 1382) = 17.58, p < .001$ . The Levene's Test of Equality of Error Variances was performed,  $F(2, 1382) = 17.58, p < .001$ . The residual variation is not equal across groups of the independent variables. Statistics are displayed in



Table 2

*Analysis of Variance for Use of Opiate Pain Relievers, NSDUH (n = 1,462)*

| Source                              | Estimated Marginal Mean | S.E. | Tests of Between-Subjects Effects |       |        |       |          |
|-------------------------------------|-------------------------|------|-----------------------------------|-------|--------|-------|----------|
|                                     |                         |      | MS                                | df    | F      | p     | $\eta^2$ |
| <b>Main Effects Model</b>           |                         |      |                                   |       |        |       |          |
| <b>Main Effects:</b>                |                         |      |                                   |       |        |       |          |
| Prescription Drug Source*           |                         |      | 343.851                           | 6     | 6.763  | <.001 | .029     |
| Friends                             | 6.76                    | 0.28 |                                   |       |        |       |          |
| Doctor reference                    | 7.70                    | 0.48 |                                   |       |        |       |          |
| Other sources                       | 10.11                   | 0.55 | 893.828                           | 2     | 17.580 | <.001 | .025     |
| Emotional/Mental/Treatment Distress |                         |      | 228.631                           | 1     | 4.497  | .034  | .003     |
| Treatment                           | 8.63                    | 0.39 |                                   |       |        |       |          |
| No treatment                        | 7.75                    | 0.33 |                                   |       |        |       |          |
| Age                                 |                         |      | 18.806                            | 2     | 0.370  | .691  | .001     |
| 18 to 25                            | 8.20                    | 0.28 |                                   |       |        |       |          |
| 26 to 34                            | 7.88                    | 0.52 |                                   |       |        |       |          |
| 35 years and older                  | 8.49                    | 0.52 |                                   |       |        |       |          |
| Sex                                 |                         |      | 51.317                            | 1     | 1.009  | .315  | .001     |
| Men                                 | 8.39                    | 0.35 |                                   |       |        |       |          |
| Women                               | 7.99                    | 0.36 |                                   |       |        |       |          |
| <b>Error</b>                        |                         |      | 50.844                            | 1,382 |        |       |          |

R Squared = .029 (Adjusted R Squared = .024)      Levene's Test =  $F(2, 1382) = 17.58, p = < .001$

\* Regression Post Hoc tests show a significant difference (2.412,  $p = .001$ ) in estimated marginal means between other sources of drugs and doctor sources.

### **Emotional/Mental/Treatment Distress**

Emotional/mental/treatment distress shows a significant difference among groups,  $F(1, 1382) = 4.497, p = .034$ . Persons receiving treatment for distress ( $M = 8.63, SE = 0.39$ ) have more opiate usage than persons not in treatment ( $M = 7.75, SE = 0.33$ ). The last decade has led to a dramatic increase in understanding the underlying mechanisms for this association (Sinha, 2008).

### **Age**

As shown in Table 1, 69.91% of the sample was age 18 to 25 , and 14.84% were age 35 years and older. There were no differences across the age groups in prescription drug use

### **Gender**

Gender showed no significant difference in opiate use among men and women,  $F(1, 1382) = 1.009, p < .001$ . Although Simoni-Wastila (2004) found that women are more likely to have access to prescription medication and are more likely to abused prescriptions, this study did not find the same outcome. Specifically, men and women in the current study reported similar number of days of opiate drug use and sources for obtaining prescription drugs.

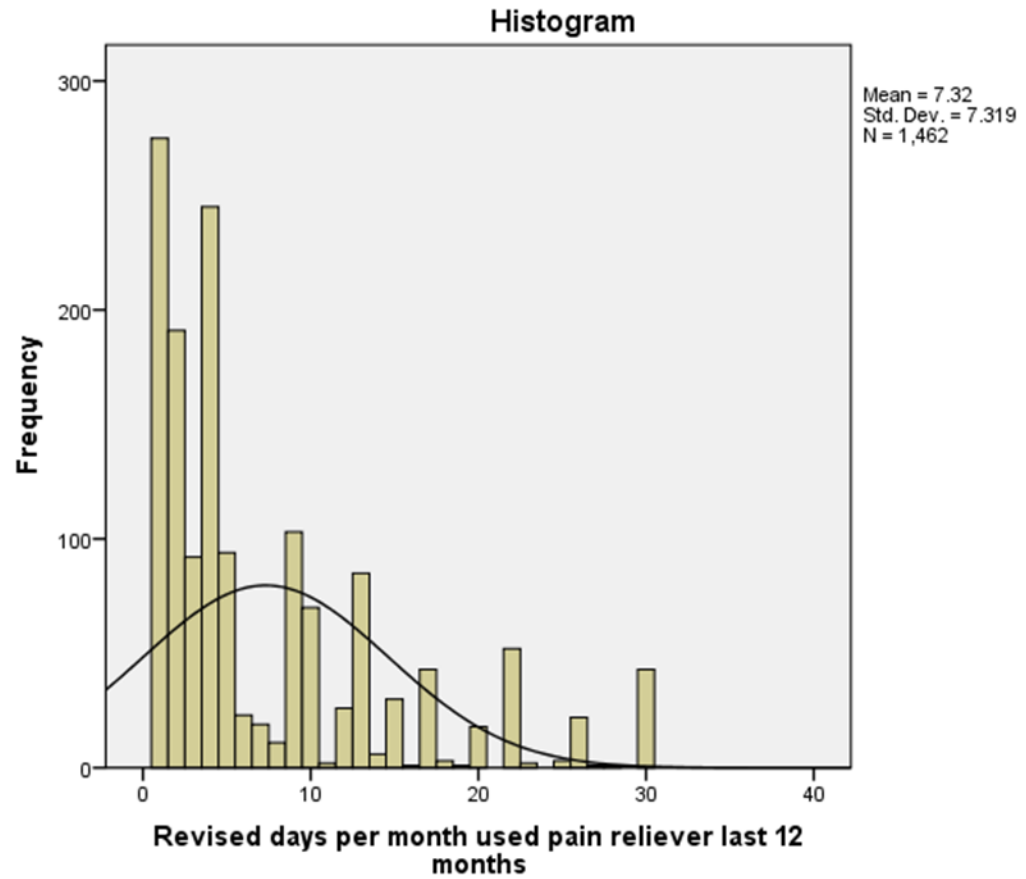
### **Histogram**

The histogram of days per month used pain relievers in the last 12 months showing the distribution of the dependent variable is not normally distributed (see Figure 2).

### **One-Way AVOVA Assumptions**

***Independent Samples.*** The subjects were split into groups and were not paired or matched in any way. This assumption was not met.

***Normality.*** Assumption for normality was not met as indicated by the skewed distribution of the histogram for days per month used pain relievers in the last 12 months.



*Figure 2.* Histogram

Days per Month Used Pain Relievers in the Last 12 Months.

Days per month used pain relievers in the last 12 months showing the distribution of the dependent variable is not normally distributed.

***Equal Variances.*** The Levene's Test indicated that there was not equal variation of the residual across categories of the independent variables.

However, the One-Way ANOVA is a robust enough procedure that the violation of this assumption should not affect the results.

### **Summary**

The hypothesis was that when controlling for age, sex, and treatment for emotional distress, people who obtain opiate prescription pills from friends and associates use more opiate prescription pills than people who obtain opiate prescription pills from physicians or other sources. Study results found that people who obtain opiate pills from other sources have more days of use than people who obtain opiate pills from doctors (reference). People who obtained pills from friends did not use more pills than those who got them from doctors. The research hypothesis was not supported.

## CHAPTER FIVE: DISCUSSION AND CONCLUSIONS

### Discussion

The purpose of the current research is to examine if people who receive opiate prescription pills from friends and doctors use more opiate prescription pills per month than people who receive them from other sources.

Prescription drug abuse is one of the major public health problems affecting many communities in the nation. More individuals are indulging in the use of prescription drugs for non-medical purposes. Educating our teachers in the schools system, and leaders in the community on both state and federal government levels, could make an impact on prescription abuse. This impact may help change the way prescription pain relievers are prescribed.

The results shows that people who obtain opiate prescription pills from other sources use pills more days per month than people who obtain pills from doctors. This contributes to the diversion of prescription drugs. Other sources indicate that people obtain prescription drugs from someone other than a doctor or friend and use them for illicit purposes. Diversion of prescription drugs has many facets (manufacturing, distribution, prescribers, pharmacies, and patients) that is very lucrative for those involved. Prescription drug diversion is dangerous when drugs are being sold on the street level as well as among abusers due to the altered state of mind from the use of the drug.

Doctor shopping is a huge contributor to prescription drug abuse, although this research study finds that drug use was higher when people used other sources as the primary source for obtaining prescription drugs. Receiving multiple prescriptions from multiple prescribers within 30-days to sell for illicit purposes, or self-abuse, is considered doctor shopping. Doctor shopping is expected to increase dramatically over the next few years and Tennessee is one of the many states that have major problems with doctor shopping.

Numerous states have adopted a Prescription Drug Monitoring Program (PDMP). The purpose of a PDMP is to collect data on individuals who receive prescriptions for narcotic pain medication and other drugs that are commonly abused. It also tracks the history of a patient for prescribers to access. The problem with this system is many prescribers do not access the PDMP database.

There are a large number of prescription abusers with mental health issues using prescription drugs for non-medical purposes. Mixing prescription pain relievers with other medication (i.e. anti-depressants) could lead to an overdose.

The prescription drug epidemic is an issue that must continue to be addressed. Finding answers or solutions to America's fastest growing drug problem is becoming more and more challenging each day.

## **Future Research**

More in-depth research is necessary to better understand sources for obtaining opiate prescription pills. Understanding the major sources for obtaining opiate prescription pills could lead to developing an educational model to decrease the prevalence of prescription drug abuse.

A three year study on women and young girls (aged 8–22) revealed that girls and young women use substances for different reasons than boys and young men. The study found that risk factors such as low self-esteem, peer pressure, and depression make girls and young women more vulnerable to substance use as well as substance use disorders, in that females become dependent faster and suffer the consequences sooner, compared to males (National Center on Addiction and Substance Abuse at Columbia University, 2003). This study found no difference in opiate pill use between men and women, but we did not address the differences in drug dependence between men and women.

The study results adds to the research surrounding the facts regarding participation in opiate pill sharing networks. The Department of Health and Human Services (2008) indicated prescriptions for opiates such as hydrocodone and oxycodone products have escalated from around 40 million in 1991 to nearly 180 million in 2007 with the U.S. as the biggest consumer. Substantial numbers of opiate pill users get their drugs from networks of friends and associates rather



than from pharmacies. Our results indicate that persons with the most opiate pill use obtain their drugs from other sources.

### **Conclusion**

This study indicates that men and women were similar in their days of drug use and their sources for obtaining prescription drugs. According to Cicero et al., (2011) women used doctor's prescriptions for abuse and/or engage in doctor shopping than men. Prescribers appear to be more sympathetic toward women when it involves pain, making prescription drugs more accessible.

Results indicate relatively high use of opiate pills among people who obtain them from sources other than doctors or friends. In the review of literature regarding sources for obtaining prescription pills, when involved in a pill sharing network individuals must obtain multiple prescriptions from prescribers to contribute to the network (National Institute on Drug Abuse, 2011). We should also study other sources of drugs.

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