An Examination of Patterns and Trends of Prescription Drug Abuse Among Adolescents

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ABSTRACT

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The purpose of this study was to examine prescription drug abuse among the adolescent population and analyze factors that may contribute to or influence adolescent drug abuse. This study examined 3 waves of a secondary data set from the Substance Abuse and Mental Health Services Administration (SAMSHA) entitled the National Survey on Drug Use and Health (NSDUH). The data from these surveys are nationally representative and include data on several types of drug use and mental health conditions. Results from the current study indicate that there were significant relationships among age, gender, race, previous alcohol use, school enrollment, general health, mental health treatment, and the use of prescription drugs in the adolescent populations. Future research should be conducted to investigate the severity of the impact adolescent prescription drug abuse will have on society and to investigate possible solutions to this problem.

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CHAPTER 1

INTRODUCTION

American culture and Western medicine rely heavily on the use of prescription medication. Prescription rates have increased dramatically over the last decade. Doctors around the country write hundreds of prescriptions each day to treat a variety of illnesses. According to Boyd, McCabe, Cranford, and Young (2006a), "Between 1992 and 2002, opioid prescriptions increased by 222%, benzodiazepines by 49%, and stimulants by 368%" (p. 2473). The mental health profession has been one to subscribe to this *pop-a-pill* philosophy and the use of prescription medication to treat depression, anxiety, and insomnia has increased. Boyd et al. (2006a) suggest that the prescription rate and the nonmedical use of abusable drugs are positively correlated.

In many medicine cabinets across the country there are bottles of unused pain relievers, sedatives, tranquilizers, and stimulants. The Partnership for a Drug-Free America (2006) reports, "More than three in five teens say prescription pain relievers are easy to get from parents' medicine cabinets" (p. 2). Many of these medicine cabinets are not locked or secured in any way to prevent such access to these medications.

Literature and research in the field of adolescent prescription drug abuse is very limited. Adolescent prescription drug abuse is a problem that has just recently emerged. Several years ago, when drug abuse was mentioned, the assumption was that the drugs being abused were illicit drugs such as marijuana, cocaine, and heroin. These were, and still are, all drugs that have to be obtained from the local drug dealer. The new drug trend that has surfaced has taken many by surprise. Americans are spending more and more money on prescription medications. The pharmaceutical business is booming. However, because the prescription rate has increased, the risk of abuse of prescription drugs has also increased. One factor that could explain this abuse could be the drugs'

availability. The Partnership Attitude Tracking Survey (2005) reveals reasons adolescents are abusing prescription medications. These reasons include widespread availability, the idea that the prescription drugs are *safer* than street drugs, the ease of obtaining them from the medicine cabinet, and that there is less shame attached to using prescription drugs (PATS, 2005). Since the emergence of prescription drug abuse, the focus has been shifted away from illicit street drugs and onto pharmaceuticals.

Middle school and high school kids are taking prescription drugs and abusing them, and many do not know what they are putting into their bodies. An even more recent and disturbing trend to arise is that of the "pharm" party, short for pharmaceuticals. These are parties "where kids bring prescription drugs – taken from family or friends' medicine cabinets – mix them together in a bowl and pop a pill cocktail, sometimes washing it down with alcohol" (Wethal, 2008). This type of recreational abuse of pharmaceuticals, in many cases, can lead to serious injury and sometimes even death.

<div align="center">Purpose of the Research</div>

The purpose of this study was to examine prescription drug abuse among adolescents 12 to 17 years of age and analyze factors that may influence adolescent drug abuse. The use of four specific classes of drugs was examined: sedatives, stimulants, tranquilizers, and pain relievers. Several variables were tested to determine if they share a relationship with prescription drug use. These variables include age, race, gender, general health, alcohol use, school enrollment, and mental health treatment. The analysis of these variables was conducted to determine the characteristics of an individual who is more likely to abuse prescription drugs. Secondary data were used to analyze these variables. The data used come from the National Survey on Drug Use

and Health, which is a nationally representative survey that is conducted by the Substance Abuse and Mental Health Services Administration.

Study Design

Three waves of the National Survey on Drug Use and Health survey were analyzed. In particular, surveys collected in the years 2002, 2004, and 2006 were used. The surveys include responses from noninstitutionalized U.S. civilians aged 12 and older. For the current study, only individuals between the ages 12 and 17 were included for analysis. The survey from the year 2002 includes 17,709 respondents, the year 2004 includes 18,294 respondents, and the year 2006 includes 18,314 respondents. The survey includes information on the prevalence and correlates of illicit drug abuse and nonmedical use of prescription drugs. This study examines the nonmedical use of prescription drugs and does not investigate illicit drug use among adolescents.

Hypotheses

Several hypotheses will be tested to identify characteristics of individuals who are more likely to abuse prescription drugs. The specific research hypotheses for this research study are as follows:

H1: There is a relationship between age and prescription drug abuse.

H2: There is a relationship between race and prescription drug abuse.

H3: There is a relationship between gender and prescription drug abuse.

H4: There is a relationship between overall health and prescription drug abuse.

H5: There is a relationship between school enrollment and prescription drug abuse.

H6: There is a relationship between alcohol use and prescription drug abuse.

H7: There is a relationship between mental health treatment and prescription drug abuse.

Limitations

The current study, although nationally representative, is not without limitations. It should be noted that the aim of this study was to determine if prescription drug abuse and the variables listed above share a relationship. It was not the goal of this study to identify the reason(s) why adolescents abuse prescription drugs, but simply to identify who is more likely to abuse prescription drugs within this specific age group. The data used for this analysis were self-reported information, so the researcher must rely on the assumption that the information obtained was accurate and honest. Given that some of the questions on the survey about drug abuse were sensitive in nature, all responses may not be truthful.

Terminology

The current study focuses on the nonmedical use of prescription drugs by adolescents. For the purpose of this study *adolescents* and *teenagers* are respondents in the 12-17 year age group. *Nonmedical use* of prescription drugs "refers to the use of a scheduled psychotherapeutic drug for which the user has no prescription, or the use of a psychotherapeutic drug for which the user has a prescription, but in a manner not intended by the prescribing clinician" (McCabe, Cranford, & Boyd, 2006b, p. 281). A "*pharm*" party, or pharmaceutical party, is a gathering where individuals, typically adolescent individuals, trade prescription drugs with one another for the purposes of achieving an altered state of consciousness. These parties have become very popular with teenagers. Typically, the individuals gather at a house and all participants bring any and all prescription drugs they could obtain from home or friends. Then the drugs are emptied into a bowl and mixed together and the individuals take a handful from the bowl to ingest. It is common for the drugs to be taken with alcohol. Most often, the drugs are never properly identified before being ingested. These parties are sometimes considered safer, by the teenagers, than doing illicit street

drugs because the stigma of having to obtain the drugs from a drug dealer is removed. The prescription drugs are seen as *safe* because they came from the medicine cabinet (Wethal, 2008).

Prescription drugs, as described in this study, can be sorted into four categories: sedatives, stimulants, tranquilizers, and analgesics. *Sedatives* are prescription drugs that cause drowsiness and dizziness and can induce sleep. Examples of this type of drug include Ambien, Halcion, and Lunesta. *Stimulants* are a class of drugs that are similar to methamphetimes. They cause alertness, awareness, and occasionally a euphoric sensation. Examples of stimulants include diet pills, Adderall, and Ritalin. *Tranquilizers* are in a class of psychotherapeutic drugs used to treat anxiety and other conditions. They may also be referred to as benzodiazepines. These medications can cause drowsiness and dizziness and give the user a very relaxed feeling. Examples of common tranquilizers include Xanax, Valium, and Klonopin. *Analgesics* are a class of drug used to treat pain. They are also commonly referred to as painkillers. These prescription medications can often cause drowsiness, dizziness, and euphoric sensations. Examples of commonly abused analgesics include Lortab, Percocet, and Oxycontin. Many of these drugs produce similar feelings and sensations; however, the chemical compounds of each drug are unique and produce specific reactions in the brain. Also, many of these prescription drugs are highly addictive and can be very dangerous if taken without a doctor's supervision. All four classes of pharmaceuticals include drugs that are commonly taken nonmedically and abused to achieve a *high* or simply for the feeling and experience they cause (Meadows, 2001).

CHAPTER 2

LITERATURE REVIEW

Prescription drug abuse among the adolescent population has increased exponentially in the past decade. Research on adolescent prescription drug abuse is limited. The problem has just been uncovered in recent years. Issues surrounding adolescent illicit drug abuse have been researched extensively, but the research has rarely narrowed to prescription drug abuse. This chapter provides a brief history of drug abuse in the United States and a review of the previous research surrounding adolescent drug abuse. It includes information on adolescent illicit and prescription drug abuse. The chapter is divided into five sections of literature. These sections focus on the history of drug abuse in the United States, nonmedical use of prescription drugs, self-medication, "pharm" parties, and findings from previous research. The section of this chapter focused on previous findings is centered on some of the variables that were examined in the current study, including age, race, gender, alcohol use, and mental health treatment. Previous research and findings have been reviewed to provide insight into the problem discussed in the current study.

<u>Drug Abuse in the United States</u>

Drug abuse has plagued the United States, and most other countries, for centuries. Many drugs that are considered illicit by current standards were originally introduced for medicinal purposes. "In the 1860s, the American Civil War literally triggered a drug epidemic, resulting in hundreds of thousands of morphine addicts – 400,000 in the Union Army alone" (Lyman & Potter, 2007, p.40).

<u>Morphine, Heroin, and Cocaine</u>

Morphine, a derivative from opium, was introduced in the early 1800s, and was originally used in surgeries and as a pain reliever. As doctors and researchers realized that morphine was

highly addictive, they turned to another drug to treat the addiction, cocaine. The United States' first major cocaine epidemic was seen between the 1880s and the 1920s. "In 1886, Atlanta-born John Styth Pemberton introduced the soft drink Coca-Cola, which for the next 20 years had a cocaine base" (p.41). Cocaine was obviously not the cure for morphine addiction but was seen for many more years as a cure for other medical ailments. This drug, and a few others, were marketed and sold by leading retailers. "Within one year of the discovery of cocaine, the Parke-Davis Company was marketing coca and cocaine in 15 different forms, including coca cigarettes, cocaine for injection, and cocaine for sniffing" (p.42). Parke-Davis, Sears-Roebuck, and many other companies sold cocaine in kits that often included syringes for easy and convenient injection (Lyman & Potter, 2007; Moeser, 1994).

Heroin was another drug that became popular for its medicinal use. It was identified as another treatment for morphine addiction as well as marketed as a sedative and cough suppressant. The name heroin was actually a trade name given to the drug by Bayer and Company when it began selling heroin commercially (Inciardi, 2008). The drug heroin was thought to be nonaddictive and because it was much more potent than morphine, only a small dose of the drug was needed for desired effect. Heroin overdose is seen in many drug-abusing communities because of the drug's potency. Small amounts of the drug can easily hamper respiratory functions and cause death.

Federal Anti-Drug Laws

The use of morphine, cocaine, and heroin significantly decreased in the early 1900s with the passage of the Pure Food and Drug Act of 1906 and the Harrison Narcotics Act of 1914. The Pure Food and Drug Act has been the only federal statute to have an effect on reducing drug addiction. The Act provided for the creation of the Food and Drug Administration. It also required

that certain drugs could only be sold by prescription and that prescription labels had to warn patients that the drugs could be addictive. The Pure Food and Drug Act was a means of regulating the distribution of drugs by the manufacturers and physicians. The Harrison Narcotics Act was a federal law that required special taxes and regulations be placed upon specific drugs. These regulations also required that any individual or group who produced, imported, or otherwise distributed these drugs had to register with the U.S. Treasury Department. However, there were also provisions guiding the manner in which these drugs had to be produced and to whom they could be distributed. There were provisions limiting the powers of physicians who prescribed the drugs, requiring that these drugs could only be prescribed for legitimate medical purposes through the course of profession practice. The drugs could no longer be prescribed to individuals who were dependent on the drug to provide for their addiction. However, with the passage of this new law regulating narcotics and cocaine, another nonnarcotic drug emerged, namely marijuana (Inciardi, 2008; Lyman & Potter, 2007).

Marijuana

Cannabis can be traced all the way back to the Chinese in 2000 B.C.E. It did not become available in the United States until the 1800s. Cannabis is the plant that the drugs hashish and marijuana are derived from. Cannabis, like the previous drugs, was sold initially for medical purposes. It was thought to be a cure for illnesses such as depression, hysteria, convulsions, and many other ailments. Cannabis came in many forms and was extracted from the hemp plant. The type of cannabis that is seen in society today originally became popular and visible in the 1920s. Marijuana, in the form of dried leaves that are smoked was identified in Mexico and subsequently brought to the United States. When it arrived in the US, marijuana was used mostly by minorities and achieved a stigma of a lower class drug. By the 1930s, states began passing antimarijuana

laws. In 1937 the Marijuana Tax Act was passed. This Act designated marijuana as a narcotic, which placed it under jurisdiction of the Harrison Narcotic Act. Marijuana was then subject to the same rules and regulations of opium-related substances and cocaine. In society today, marijuana is still the leading drug abused, possibly due to the ease of production, as well as the prevalence (Inciardi, 2008; Lyman & Potter, 2007).

<u>Alcohol</u>

Even with the development and discovery of new drugs throughout time, there has been one intoxicant that has remained constant. The use of alcohol to alter a mental state has been an activity enjoyed by many for several generations. It is believed that alcohol was first discovered during the Stone Age. Drinking alcohol has generally been an accepted behavior as long as it is done in moderation. An increase in the amounts of alcohol consumed was identified in the early 1900s and the atmosphere surrounding the behavior changed. People began to view alcohol, like morphine, cocaine, and heroin, as an evil substance that destroyed lives. Thus, in 1919, "the Eighteenth Amendment was passed outlawing the manufacture and sale of alcohol except for industrial use" (Lyman & Potter, 2007, p. 47). This law marked the beginning of the Prohibition era. Alcohol, although illegal, would not disappear, and neither would the problems surrounding its use. The time period during Prohibition soon become known as the Roaring Twenties, with strong resistance against alcohol prohibition. The use of alcohol and marijuana increased dramatically during this time, while the use of opium narcotics and cocaine showed a marked decrease. It became obvious that prohibiting the use of alcohol was not decreasing the use and abuse of alcohol and in 1933 the Twenty-first Amendment was passed repealing the Eighteenth Amendment (Inciardi, 2008; Lyman & Potter).

Drug Enforcement Agencies

In response to the increase in drug and alcohol use the Federal Bureau of Narcotics was formed within the Treasury Department. This was the first attempt at providing a specified department or agency to deal with the drug problem in America. Enforcement of the Harrison Tax Act and the Marijuana Tax Act were the responsibilities of the Federal Bureau of Narcotics. The Drug Abuse Control Amendments to the Narcotics Control Act (1956) were passed in 1965. "These brought the manufacture and distribution of amphetamines and barbiturates under federal control and imposed criminal penalties for illegally manufacturing these drugs" (Lyman & Potter, 2007, p. 53). These amendments also provided for the creation of the Bureau of Alcohol and Drug Abuse Control within the Department of Health, Education, and Welfare. In 1968 the two agencies were combined to form the Bureau of Narcotics and Dangerous Drugs within the Department of Justice. This was the first time in U.S. history that the Department of Justice was given the authority to enforce federal drug laws. "In 1973, President Richard Nixon implemented a drug enforcement reorganization plan that addressed the supply side of drug abuse as well as the demand component of the problem" (p. 325). The reorganization plan allowed for the conception of a central federal agency to combat illegal drug trade in the United States, the Drug Enforcement Administration. The DEA is the only federal law enforcement agency that has one primary concern and responsibility. "The dominant philosophy of the DEA is to eliminate drugs as close to their source as possible and to disrupt the drug-trafficking system by identifying, arresting, and prosecuting traffickers" (p. 326).

Drug Related Offenses

There are several types of offenses that constitute as a drug offense. These various drug offenses can be seen in state and federal statutes and can hold very different punishments.

Depending upon where the violation was documented and who apprehended the violator, either state or federal charges will be brought against the offender. Although they vary across jurisdictions, drug laws are specific about what constitutes a violation of a drug law and these violations can be broken down into three general categories: possession and use, manufacturing, and distribution. The possession category prohibits individuals from possessing or using an illegal substance, with the exception requiring a lawful prescription. Manufacturing laws include activities that are related to the production of an illegal substance, and distribution laws prohibit the sale and delivery of illegal drugs. There are also other prohibited activities that can be prosecuted as drug offenses. These activities can include possession of drug paraphernalia, money laundering, and conspiracy.

Drug Related Arrest Rates

According to the Bureau of Justice Statistics there were roughly 1,841,200 state and local arrests for drug abuse violations in the United States in 2007. The number has been increasing exponentially. In the 1980s, there were less than one million arrests for drug abuse violations per year. Between 1994 and 2003 law enforcement officers made over 1.9 million arrests of juveniles for drug related violations. Most of the charges against adolescents are for possession or use of an illegal substance, rather than the manufacturing or distributing drugs. Also, between 1999 and 2003 juvenile arrests involving synthetic narcotics increased by nearly 80% and arrests involving dangerous nonnarcotics increased by 50%. During the same 5-year period the number of arrests involving marijuana increased only 5%. Information is limited regarding exactly what types of narcotics were involved in the arrest, yet it is evident that these types of drugs are becoming more prevalent with the adolescent population. Another statistic that has been on the rise is the percentage of drug arrests based on the total number of arrests per year. Drug arrests accounted for

7.4% of all arrests reported to the FBI in 1987, and rose to 13% by 2007. Since 1996 marijuana has been the drug involved in the majority of arrests for drug violations. Again, it could be reasoned that the ease of production of marijuana contributes to its prevalence. It could also be hypothesized that because more agencies and departments have been created to combat illegal drug use, the number of arrests for drug related offenses has also increased (Federal Bureau of Investigation, 2004; U.S. Department of Justice, 2007).

<div align="center">Nonmedical Use of Prescription Drugs</div>

Prescription drug abuse has just recently been recognized as a problem in the United States. It has received a decent amount of attention from mainstream media; however, research on the issue has been limited. Only a handful of researchers have investigated the problem thoroughly. These researchers include Sean McCabe of the Substance Abuse Research Center, and Carol Boyd of the Addiction Research Center at the University of Michigan. Collectively they have collaborated on several studies to examine adolescent prescription drug abuse and the motivations behind the problem.

Prescription drug abuse is typically referred to as the nonmedical use of prescription drugs. Nonmedical use is defined as the use of prescription drugs in a manner that is inconsistent with the intentions of the prescribing physician. The most commonly abused prescription drugs are pain relievers, stimulants, and sedatives. It has been found that prescription drug abuse is second only to marijuana in the population of illicit drug users (Boyd et al., 2006b).

Nonmedical use of prescription drugs can occur in many different settings and scenarios. If an individual is legitimately prescribed a medication by a physician, but takes more than the prescribed dose to achieve an altered state of mind, it would be considered nonmedical use of a prescription drug. The individual was not taking the drug for the prescribed reason or to treat a

particular medical condition. Another example of nonmedical use of prescription drugs would be seen if a friend or family member took pain medication from the other for a toothache. Relief of a toothache was probably not the original intended use of the medication as prescribed by the clinician. "Pharm" parties and self-medication are other forms of nonmedical use of prescription drugs and these types of prescription drug abuse will be discussed in detail later in this chapter. Less extreme, more innocent behaviors can also be examples of nonmedical use and can easily lead to prescription drug abuse. For example, a wife taking her husband's sedatives to treat a problem sleeping can quickly and easily lead to addiction and abuse (Boyd et al., 2006a).

There are several theories hypothesizing why this new form of drug abuse has occurred. The most prominent explanation suggests that the increase in the prescription rate has caused an increase in abuse of those prescribed medications. The availability of abusable prescription medications has increased tremendously over the past few years. This increase could be due to a number of factors, including the increased effectiveness of certain medications to treat particular ailments, the ease of production of these medications, and the ability to identify symptoms of conditions that can be treated with medication. Some studies suggest that an increase in the medical use of prescription medication will ultimately lead to an increase in the abuse of said medications primarily because of increased availability (CASA, 2007; McCabe et al., 2006a).

Internet pharmacies were introduced in the late 1990s and have become a largely relied upon resource for obtaining prescription drugs. The National Center on Addiction and Substance Abuse at Columbia University, lead by Califano, Jr. (2007) conducted a study to examine the availability of controlled substances at online pharmacies. They found that, as of 2007 there were 581 websites online offering schedule II through schedule V controlled substances. "Eighty-four percent of sites offering controlled prescription drugs do not require that the patient provide a

prescription from his or her doctor" (p. i). Some of the websites offer patient consultations so that a diagnosis can be given and an online doctor then writes a prescription. This is just one example of ways to avoid regulations requiring a valid prescription. Essentially all that is needed to obtain prescription drugs online is Internet access and a valid credit card number. There are virtually no measures in place to restrict access to these online pharmacies to children under the age of 18. One of the weak measures found to control access was the requirement to enter an age before being granted access to the website. Entering a false age can easily circumvent this restriction. These Internet pharmacies are just another way on increasing prescription drug availability as well as allure (CASA, 2007).

If the explanation citing the increasing prescription rate is accepted, how is the increase in the prescription rate explained? Pharmaceutical companies rely on marketing strategies to promote and sell their product. These strategies employed by pharmaceutical companies, as with any other type of company, provide a considerable amount of influence on society. They help shape societal beliefs and values. The increases in the prescription rate may possibly be attributed to these strategies. America's pill-popping society has come to rely on medicinal solutions to almost any physical or mental complaint. There are only a few common conditions that are not treated with medication. In fact, "ninety-one percent of Americans have taken prescription drugs and more than half (54 percent) taken them regularly" (CASA, 2005, p. 12). Marketing strategies to promote specific medications for relief of particular conditions or symptoms shape the way society views prescription drugs. Television commercials, magazine advertisements, billboards, and even some forms of public transportation aid in promoting this new medicinal culture. These ads give the appearance that taking prescription medication is a perfectly normal behavior and all of the medications are perfectly safe, when in many cases they are not safe or effective.

Regardless of the theory chosen to explain this social problem, the fact remains that prescription drugs are being distributed at a higher rate than in previous years. According to a study conducted by the National Center on Addiction and Substance Abuse at Columbia University (2005), "in 2002, more than three billion prescriptions were filled for over 500,000 different drugs; 234 million for controlled prescription drugs" (p. 26). This study also found that between 1992 and 2002 the "number of prescriptions filled for controlled drugs climbed 154.3 percent…" (p. 23). The New York Times (2008) also reported that in a ten-year period, between 1997 and 2007, "the number of prescriptions filled had increased 72 percent…" (Saul, 2008). The findings from these studies are more than sufficient evidence to conclude that the number of prescriptions written and filled each year is rising and more prescription drugs are becoming widely available (CASA, 2005).

Self-Medication

An article in the New York Times (2005) provides some insight into a newer form of nonmedical use of prescription drugs referred to as self-medication. The new trend seen in Manhattan, NY is that of trading prescription drugs. This has been done for years, but the difference in this situation is that the prescription drugs are traded to treat medical conditions, not to get high. One of the individuals involved in this practice is quoted in the article saying, "I acquire quite a few medications and then dispense them to my friends as needed. I usually know what I'm talking about" (Harmon, 2005). Her attitude about illegally dispensing prescription medication is nonchalant and she defends this by saying, "It's not like we're passing out Oxycontin, crushing it up and snorting it…I don't think it's unethical when I have the medication that someone clearly needs to make them feel better to give them a pill or two" (Harmon, 2005).

Experts in the field of drug abuse are perplexed about this new form of drug abuse and about the acceptance it has gained.

This explanation of prescription drug abuse has drawn some attention from some researchers. The concept of self-medication refers to the behavior of treating a mental health condition with prescription drugs without the supervision of a proper physician. This theory was originally identified to explain the rate of which drug abuse and mental health disorders occurred together. "One prominent explanation for the high rates of co-occurrence is that individuals use psychoactive substances to 'self-medicate' painful or disturbing psychiatric symptoms" (Harris & Edlund, 2005, p.118). At the core of this theory is the view that individuals who are self-medicating mental health disorders believe that their symptoms are treatable and knowingly take drugs to alleviate them. Other theories have also been formulated hypothesizing that the use of psychoactive substances can lead to mental health disorders later in life. Either way, the use of prescription drugs and the occurrence of mental health disorders seem to have some connection to one another (Boyd et al., 2006b)

Harris and Edlund (2005) conducted a study to test for the existence of behavior that is consistent with self-medication. They examined "the relationships between drug and alcohol use and perceptions of unmet need for mental health care and use of mental health care" (p.118). In the study, they analyzed two waves of data from the National Survey on Drug Use and Health. The analysis indicated that individuals who reported mental health problems were more likely to use drugs. It was also found that the rate of use increased with the severity of their reported mental health issues. Individuals who were identified as having an unmet need for mental health services were also seen to have rates of illicit drug use, excluding marijuana, higher than that of the general population. Marijuana did not appear to share any relationship with mental health care or the lack

thereof. Heavy alcohol use did not appear to share a relationship with the perception of an unmet need of mental health services, but was found to decrease with mental health care use. "The positive relationship between unmet need and illicit drug use and the negative relationship between mental health care use and heavy alcohol use among those without substance dependency is consistent with the behavior predicted under the self-medication hypothesis and suggests that mental health treatment may prevent the development of substance-use disorders" (p.132).

Pharm Parties

"Pharm" parties have become the new trend with teenagers. The name is derived from the word pharmaceutical. Teenagers organize these parties and each individual attending is expected to bring prescription drugs from home. Once at the party, the kids drop all the pills into a bowl and each person either receives a baggie full of drugs or takes a handful of pills from a bowl. Many times these pills are followed with alcohol. The manner in which these drugs are distributed at *pharm parties* is very similar to the manner in which a hostess at a cocktail party serves snacks and drinks. Drug counselors across the nation are hearing more and more about these pill-popping parties and the trend is disturbing (Friedman, 2006; Leinwand, 2006).

The adolescent population has actually gone as far as to create jargon related to these parties. The bowls of pills are often referred to as *trail mix*, the act of digging through the pills to find specific ones is termed *grazing*, and going through medicine cabinets to find prescription drugs is referred to as *pharming.* Some prescription drugs typically found at these parties can include Vicodin, OxyContin, Adderall, Ritalin, Xanax, Valium, Prozac, Ambien, and Lunesta. These drugs are some of the most common pharmaceuticals prescribed daily to patients, so they can easily be found in many homes across the country. Some teenagers who are abusing prescription drugs like those found at these parties are even turning to the Internet to share

"recipes" with each other. These "recipes" are different combination of prescription drugs that will produce a desired effect or high (CASA, 2007).

Pharm parties are a fairly new trend among juvenile drug abusers and very little information is available regarding this new form of adolescent entertainment. Pharm parties have just recently been on the rise and many people are not even aware that they exist. Many people are aware of "farm" parties, which are generally parties held in someone's barn out on farmland on the weekend and the primary activity was drinking alcohol. This can cause a serious problem, particularly when children say they are going to a "pharm" party, but all that is heard is that they are going to a "farm" party. The two are very distinct and can result in drastically different consequences.

<u>Demographic Profile of Drug Abuse</u>

Several studies have identified the demographic characteristics of drug users, gathering information on variables such as age, race, gender, income, and education. This demographic profile can vary across the research, given that drug abuse is an ever-changing social problem. Drug users can come in all shapes and sizes and can be surprising at times. Of the studies conducted to examine prescription drug abuse, many of the results are consistent with one another and provide a relatively similar portrayal of the prescription drug abuser.

A study conducted by the National Center on Addiction and Substance Abuse at Columbia University in 2005 reports several demographic variables for illicit drug use, including prescription drug abuse. This report suggests that the rate of prescription drug abuse is growing at a much faster pace for adolescents than adults. It was also reported that adolescents who reported using prescription drugs nonmedically were five times more likely to have reported previous alcohol use. This study also states that adults who abuse only prescription drugs are more likely to be women,

late 30s, higher education, higher income, and married, as opposed to individuals who abuse several drugs (CASA, 2005).

A few studies have been conducted that have focused primarily on adolescent prescription drug abuse. Boyd, McCabe, and Teter (2006b) conducted a study to examine the nonmedical use of prescription pain medications among public school students. They found significant gender differences in the medical and nonmedical use of prescription pain relievers. Girls were more likely to have used prescription pain relievers in their lifetime. Racial differences were not found to be significant between Whites and African-Americans. It was also found that individuals who used pain relievers nonmedically were five times more likely to have report past alcohol use and eight times more likely to have reported the use of several other drugs. This research also suggested that self-medication could play a role in the nonmedical use of some widely prescribed medications. It was also found that the "two leading sources for nonmedical pain medication were family and friends" (p. 43).

A study similar to Boyd et al.'s (2006b) research was conducted by McCabe, Boyd, and Teter (2005) to examine the nonmedical use of prescription pain relievers. McCabe et al. (2005) analyzed data from the Monitoring the Future Study to identify correlates of pain reliever use in high school seniors. This study used a nationally representative sample and focused primarily on the use of two opioid pain relievers, OxyContin and Vicodin. Several demographic differences were found among the adolescent drug abusers. It was found that males were more likely to report illicit use of Vicodin and OxyContin than females. "White students were over four times more likely than African-American students to report illicit use of Vicodin" (p. 227). It was also found that illicit Vicodin users were more likely to report previous alcohol use, particularly within the

previous month. In addition, heavy binge drinking shared a relationship with illicit use of Vicodin and OxyContin.

McCabe, Boyd, and Teter (2006a) also investigated the nonmedical use of prescription medication among a sample of undergraduate students on a college campus. The analysis found that undergraduate men were more likely than women to report nonmedical use of sedatives, stimulants, analgesics, and tranquilizers. Racial differences were also identified. White and Hispanic students were more likely to report abuse of prescription medication than African-American and Asian students. This study found that four out of five prescription drug users also reported excessive alcohol use as well. In addition, this research confirmed national findings regarding the rise of prescription drug abuse. On the college campus in this study prescription drugs were the second most common abused substance, following marijuana. The findings of this study are consistent with previous research on demographic characteristics of prescription drug abusers.

Saylor et al. (2007) conducted a study similar to the previous research. They conducted a study to examine the use of legally obtainable products for the purpose of "getting high", including nonmedical use of prescription medications. The analyses were conducted on information obtained from fifth, sixth, and seventh grade students in four Alaskan communities. Results from this research indicate that 8% of respondents reported using prescription medications nonmedically in their lifetime. However, this particular study did not find any statistically significant demographic differences in the use of any illicit substances.

McCabe, Cranford, and Boyd (2006b) conducted a study to further address the relationship between past alcohol use and prescription drug abuse among adolescents. They investigated the relationship between previous alcohol use and the nonmedical use of prescription drugs among

individuals 18 years or older. This study found that individuals between the ages 18 and 24 had higher rates of alcohol use and nonmedical use of prescription drugs. Racial differences were also apparent in this study, suggesting that African-Americans had a lower risk of prescription drug abuse and Native Americans had a very high risk for nonmedical use of prescription drugs.

There is limited research on the phenomenon identified as self-medication among adolescents. Hansell and White (1991) conducted a study to examine the relationship between adolescent drug use and psychological distress. They tested to determine whether drug use is brought on by symptoms of psychological distress or if the drug use causes mental health symptoms. The results of this research suggest that the theory of self-medication is false and that the symptoms of mental health issues follow drug abuse. There was no evidence supporting the hypothesis stating that psychological distress can prompt drug use among adolescents. The results of this study are limited however, and can only be applied to the study population.

<u>Summary</u>

Drug abuse is not a new phenomenon. Previous literature suggests that drug abuse dates back to prehistoric times yet has evolved over centuries. There have been several drug trends and patterns of abuse, from morphine and heroin to cocaine and marijuana. Yet, the new trend facing the United States is the nonmedical use and abuse of prescription drugs. This type of drug abuse is not centralized around one specific group of individuals or among a particular social status. Prescription drug abuse can be seen in societies and social crowds everywhere. The troubling development lies with a recent emphasis on adolescent prescription drug abuse.

It has been unclear as to the nature and the severity of the problem of adolescent drug abuse. There are several studies investigating illicit and illegal drug use among adolescents, yet there is limited research examining prescription drug abuse among juveniles. The research that has

been conducted has provided somewhat of a demographic profile of the teenage prescription drug abuser. These profiles have varied with the different types of prescription drugs used, but seem to be fairly consistent. Many drug users have reported using other prescription or illicit drugs in their lifetime and also typically report previous alcohol use. When examining the use of prescription pain relievers the profile of the drug abuser suggests that they will be white males. An examination of all prescription drugs used reveals a similar profile. It is difficult to identify any one of these profiles revealed in previous research as the accurate portrayal because drug abuse transforms so frequently and drastically over time.

CHAPTER 3

METHODOLOGY

The purpose of this study was to examine trends of prescription drug abuse among the U.S. adolescent population. Several factors were analyzed to determine if they shared a relationship with adolescent prescription drug abuse including age, race, gender, general health, alcohol use, school enrollment, and mental health treatment. It was predicted that all of these variables would share a relationship with prescription drug abuse. The direction of these relationships was not predicted in this research. The following section describes the data used for the study, the variables used to test the hypotheses and the analyses conducted for this research.

Data

The data used in the current research were obtained from the Inter-university Consortium for Political and Social Research (ICPSR), which was available on the University of Michigan's website. The data were collected by the Office of Applied Studies within the Substance Abuse and Mental Health Services Administration. The survey used to collect these data was the National Survey on Drug Use and Health. This survey has been conducted periodically since 1971. It is a nationally representative sample of all noninstitutionalized U.S. civilians aged 12 or older. The survey used a computer-assisted interviewing (CAI) method for the collection of data. This survey is cross-sectional and uses a self-reporting method of collection. It employs a 50-state design using a multistage area probability sample for each of the 50 states and the District of Columbia. Respondents of the survey are given an incentive payment of $30.

Three waves of the survey were used for analysis in this study. Specifically, the years 2002, 2004, and 2006 were used in this research. For the current research, only individuals between the ages 12 and 17 were included for analysis. After selecting cases of individuals who were within the

age range, the sample size for the year 2002 was 17,709, the year 2004 was 18,294, and the year 2006 was 18,314. Bivariate analyses were conducted on the 2006 wave of the survey to identify relationships between the dependent and independent variables and to determine the strength of those relationships. The data from the surveys in 2002, 2004, and 2006 were compared to identify trends and patterns of adolescent prescription drug abuse over the six-year period.

<div align="center">Variables</div>

Dependent Variables

The current study investigated the relationships between certain variables and adolescent prescription drug abuse. The use of four prescription drugs was used as dependent variables in this research. All of the dependent variables were measured at the nominal level and included the use of analgesic drugs (1=yes and 91=no); use of tranquilizers (1=yes and 91=no); use of stimulants (1=yes and 91=no); use of sedatives (1=yes and 91=no). For the purpose of this study, all of these variables were recoded into new variables (1=yes and 2=no).

Independent Variables

There were seven independent variables analyzed in this study. Age, race, gender, general health, alcohol use, school enrollment, and mental health treatment were used in analysis with the use of prescription drugs. The first three variables were of a demographic nature. The first independent variable, age, was defined by the respondents' birth date entry (1=respondent is 12 years old; 2=respondent is 13 years old; 3=respondent is 14 years old; 4=respondent is 15 years old; 5=respondent is 16 years old; 6=respondent is 17 years old). The second variable in this study was race. This variable was measured at the nominal level and was coded 1=Non-Hispanic White, 2=Non-Hispanic Black/African American, 3=Non-Hispanic Native American, 4=Non-Hispanic Pacific Islander, 5=Non-Hispanic Asian, 6=Non-Hispanic more than one race, 7=Hispanic. Race

was recoded for the analyses with 1=White, 2=Black, 3=Hispanic, and 4=Other. Third, the variable gender was measured at the nominal level and coded as 1=male and 2=female.

The respondent's overall health was measured at the ordinal level and coded as 1=excellent, 2=very good, 3=good, 4=fair, and 5=poor. School enrollment was measured nominally to determine if the respondent was currently attending or currently enrolled in a school and the variable was coded with 1=yes and 2=no. Alcohol use was also measured nominally to identify if the respondent has ever had a drink of any type of alcohol and the variable was coded with 1=yes and 2=no. Finally, mental health treatment was measured nominally to determine if the respondent had ever received mental health treatment or counseling for conditions not caused by alcohol or drugs and the variable was coded as 1=yes and 2=no.

<div align="center">Analysis</div>

Univariate

Univariate analyses were conducted to summarize the sizable amount of data included in this study. Frequency distributions and descriptive statistics were generated for all of the independent variables. This technique allowed the researcher to present the frequency of each response in a concise manner. Percentages were also displayed in the tables to provide a clearer picture of the way variable attributes were distributed.

Bivariate

Bivariate analyses were also conducted on the independent variables for each dependent variable to determine if significant relationships existed between the variables. The Chi-square analyses allowed the researcher to form conclusions about the national population of adolescents including those who use prescription drugs and those who do not. The Chi-square analyses determined whether the relationships between the independent and dependent variables were

statistically significant. Two measures of association were used to determine the strength of the relationship, if it existed. These two statistics were Cramer's V and Phi. These tests provided results indicating the strength and magnitude of the relationship. Crosstabulations were also generated to determine the direction of the relationship between the independent and dependent variables.

Summary

The present study was done in an effort to add to the existing literature on adolescent prescription drug abuse. The analyses were conducted to identify possible characteristics of individuals who were more likely to use prescription drugs, such as age, gender, race, school enrollment, health, alcohol use, and mental health treatment. A limited number of previous studies have addressed a few of these variables in relation to prescription drug abuse.

CHAPTER 4

ANALYSIS OF DATA

The purpose of this study was to examine patterns and trends of prescription drug abuse among adolescents and to identify characteristics of individuals who were more likely to use prescription drugs. The relationship between prescription drug abuse and age, gender, race, health, school enrollment, previous alcohol use, and mental health treatment was investigated. It was predicted that all of these variables would share a significant relationship with the use of prescription drugs among adolescents.

This chapter provides the results of the statistical analyses conducted in this study. Data from the National Survey on Drug Use and Health from the year 2006 was used to test the hypotheses in this study. Bivariate analyses were conducted to determine if any relationships existed between the dependent and independent variables. Given that all variables used for this study were measured at the nominal and ordinal level, crosstabulations and Chi-square tests were used to identify significant relationships. An alpha level of .05 was selected for the current study. As a result, in order for a significant relationship to exist the critical value of the Chi-square test must be equal to or greater than the critical region defined by the .05 alpha level.

There are eight tables provided in this chapter. The first table displays the univariate statistics, which contain demographic characteristics of the sample. The remaining seven tables provide the results of the bivariate statistics conducted in this study.

Descriptive Characteristics of the Sample

Table 1 contains a descriptive summary of the data used for analysis. The descriptive statistics were presented for the independent variables in the sample and include age, race, gender, health, school enrollment, previous alcohol use, and mental health treatment. Only respondents that

were between 12 and 17 years of age were included for analysis. In the 2002 wave of the survey there were 17,709 respondents that were between 12 and 17 years of age, with the highest percentage being 14 years of age (17.6%). There were seven categories of race; Non-Hispanic White (66.3%), Non-Hispanic Black (13.6%), Non-Hispanic Native American (1.1%), Non-Hispanic Pacific Islander (0.5%), Non-Hispanic Asian (2.5%), Non-Hispanic Mixed Race (2.2%), and Hispanic (13.8%). Of the respondents males and females were almost equally divided, with 51% males and 49% females. The most common response given for overall health was very good (41.1%) and 1,670 individuals reported having been treated for mental health issues. There were 17,439 individuals that were enrolled in school at the time of the survey and only 1.5% reported that they were not enrolled in some form of school. Previous alcohol use was almost equally distributed with 43.6% reporting prior alcohol use and 56.4% reporting no alcohol use.

There were 18,294 respondents that were between 12 and 17 years of age included in the 2004 wave of the survey. Of the respondents, 17.4% reported being 13 years of age. Similar to the 2002 sample, the racial composition of the sample is comparable to the diversity seen in society with the majority of respondents being Non-Hispanic White (63.9%); Hispanic (14.3%); and, Non-Hispanic Black (13.5%). Males and females had a distribution identical to the previous sample with 51% males and 49% females. Most individuals in this wave of the survey also reported their overall health as very good (7,645) and 10.5% received mental health treatment. Of the respondents in this sample, 98.3% were enrolled in school, leaving only 1.7% of individuals not enrolled at the time of the survey. With regard to previous alcohol use, this sample was also approximately evenly distributed with 42.9% of individuals reporting prior alcohol use and 57.1% stating that they had never used alcohol. The results of this wave of the survey are very similar to the results in the 2002 survey.

In the 2006 wave of the survey there were 18,314 respondents between the ages of 12 and 17. This sample included more respondents that were 15 years of age (17.4%). With respect to race, the majority of individuals were Non-Hispanic White (60.7%); Hispanic (16.7%); and, Non-Hispanic Black (14.2%). Gender distribution was also similar to the previous two samples, with 51.1% of respondents male and 48.9% of respondents female. The majority of individuals in this wave of the survey reported their overall health as Very Good (42.3%) and 1800 respondents reported receiving mental health treatment in the past. Nearly all of the respondents reported being enrolled in school at the time of the survey, with only 1.4% of respondents not enrolled in school. Of the respondents in this survey, 41.7% had previously used alcohol while 58.3% stated they had not used alcohol. The results from the 2006 wave of the survey are fairly consistent with results from the 2002 and 2004 surveys with respect to differences and similarities among the independent variables.

The demographic characteristics for all three waves of the survey were nearly identical. The samples included an almost equal amount of individuals from both genders. It also included individuals evenly distributed across the six age categories. This seems to reflect the diversity and distribution of individuals within society.

Table 1
Descriptive Characteristics of the Sample

	2002		2004		2006	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Age						
12 years	3,111	17.6	2,874	15.7	2,805	15.3
13 years	3,085	17.4	3,186	17.4	3,038	16.6
14 years	3,119	17.6	3,139	17.2	3,089	16.9
15 years	2,844	16.1	3,116	17.0	3,193	17.4
16 years	2,776	15.7	3,010	16.5	3,159	17.2
17 years	2,774	15.7	2,969	16.2	3,030	16.5
Total	17,709	100.0	18,294	100.0	18,314	100.0
Gender						
Male	9,031	51.0	9,330	51.0	9,355	51.1
Female	8,678	49.0	8,964	49.0	8,959	48.9
Total	17,709	100.0	18,294	100.0	18,314	100.0
Race						
Non-Hisp White	11,745	66.3	11,695	63.9	11,113	60.7
Non-Hisp Black	2,407	13.6	2,463	13.5	2,593	14.2
Non-Hisp Native American	196	1.1	292	1.6	257	1.4
Non-Hisp Pacific Islander	83	0.5	56	0.3	89	0.5
Non-Hisp Asian	447	2.5	496	2.7	518	2.8
Non-Hisp Mixed Race	386	2.2	671	3.7	681	3.7
Hispanic	2,445	13.8	2,621	14.3	3,063	16.7
Total	17,709	100.0	18,294	100.0	18,314	100.0
Overall Health						
Excellent	6,063	34.2	6,207	33.9	5,913	32.3
Very Good	7,272	41.1	7,645	41.8	7,752	42.3
Good	3,749	21.2	3,803	20.8	3,986	21.8
Fair	574	3.2	599	3.3	626	3.4
Poor	49	0.3	35	0.2	32	0.2
Total*	17,707	100.0	18,289	100.0	18,309	100.0
School Enrollment						
Yes	17,439	98.5	17,980	98.3	18,051	98.6
No	267	1.5	309	1.7	256	1.4
Total*	17,706	100.0	18,289	100.0	18,307	100.0
Prior Alcohol Use						
Yes	7,707	43.6	7,851	42.9	7,623	41.7
No	9,989	56.4	10,431	57.1	10,674	58.3
Total*	17,696	100.0	18,282	100.0	18,297	100.0
Mental Health Treatment						
Yes	1,670	9.5	1,906	10.5	1,800	9.9
No	15,938	90.5	16,270	89.5	16,344	90.1
Total*	17,608	100.0	18,176	100.0	18,144	100.0

*Some respondents refused to answer questions or left unanswered.

Hypothesis 1

The first hypothesis was tested to determine whether an individual's age shared a relationship with the use of prescription drugs. Table 2 presents the results from the chi-square analysis of age and prescription drug use. Based on these results, the null hypothesis of no relationship is rejected. The chi-square analyses revealed significant associations between age and all four dependent variables; pain relievers ($x^2 = 480.10$, $p = .000$), stimulants ($x^2 = 219.60$, $p = .000$), sedatives ($x^2 = 302.00$, $p = .000$), and tranquilizers ($x^2 = 15.354$, $p = .009$). The degrees of freedom for all four tests were 5. With the exception of tranquilizers, use of prescription drugs was more likely among respondents 17 years of age. Crosstabulations indicate that individuals 16 years of age were the most likely to use prescription tranquilizers. In this sample, younger individuals were least likely to use any of the four prescription drugs. Crosstabulations for all four dependent variables also suggested a positive relationship between age and prescription drug abuse, with the use of all prescription drugs increasing as age increased (Table 3).

Another test was conducted to determine the strength of the relationship between age and the use of prescription drugs since the Chi-square test was significant at the .05 alpha level. In order to determine the strength of that relationship the Cramer's V statistic was generated for each Chi-square test (Table 2). A moderate association was observed with analgesics and tranquilizers, and a moderately weak relationship was revealed with stimulants and sedatives. The association was the strongest for pain relievers (Cramer's V = .162) and the weakest for tranquilizers (Cramer's V = .029).

Cohen (1988) suggested that an effect size should always be reported to determine the strength or magnitude of any relationship that was found statistically significant because many statistics, including chi-square, can be influenced by sample size. For the purpose of the current

study, the measures of association Phi and Cramer's V have been calculated to determine the effect size. Cohen (1988) provided guidelines to distinguish between small, medium, and large relationships when interpreting measures of association. He described a small relationship with a coefficient of .10, a medium effect with a coefficient of .30, and a large relationship with a coefficient of .50. It is important to note that many of the relationships identified in this study have very small associations, if not nonexistent associations, by Cohen's (1988) standards; however, the measures of association in this study were interpreted in relation to one another and also bearing in mind the effects of the extremely large sample size.

Table 2

Chi-Square Test of Independence and Cramer's V Test of Association for Age

	X^2	df	P-Value	Cramer's V
Analgesics	480.10*	5	.000	.162
Stimulants	219.60*	5	.000	.109
Sedatives	302.00*	5	.000	.029
Tranquilizers	15.354*	5	.009	.128

* Significant at .05 alpha level.

Table 3

Crosstabulation for Prescription Drug Use and Age (Percentage)

	Age in Years					
	12	13	14	15	16	17
Pain Reliever Use						
Yes	4.6	5.1	7.7	11.7	15.2	17.9
No	95.4	94.9	92.3	88.3	84.8	82.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
Stimulant Use						
Yes	1.2	1.2	2.1	3.9	5.3	6.4
No	98.8	98.8	97.9	96.1	94.7	93.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
Sedative Use						
Yes	0.5	0.6	0.9	1.1	1.2	1.1
No	99.5	99.4	99.1	98.9	98.8	98.9
Total	100.0	100.0	100.0	100.0	100.0	100.0
Tranquilizer Use						
Yes	0.6	0.6	1.2	3.3	4.4	6.2
No	99.4	99.6	98.8	96.7	95.6	93.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

Hypothesis 2

Table 4 displays results from the second hypothesis, which tested for a relationship between race and prescription drug abuse among adolescents. Originally the race variable was coded into seven categories (Table 1); however when a Chi-square analysis was performed on the variable there were several cells that had expected counts less than 5. To remedy this problem, the variable was recoded and the categories were collapsed into 4 categories including White, Black, Hispanic, and Other. A Chi-square test of independence was conducted on the new recoded race variable to determine if a relationship existed between the independent and dependent variable.

The Chi-square test of independence indicated a significant relationship between race and prescription drug abuse, with the exception of sedatives. The null hypothesis of no relationship was rejected for pain relievers, stimulants, and tranquilizers, but could not be rejected for the use of sedatives. The relationships seen in the Chi-square analyses between race and the use of pain relievers ($x^2 = 15.938$, $p = .001$), tranquilizers ($x^2 = 58.819$, $p = .000$), and stimulants ($x^2 = 49.112$, p

= .000) were all significant at the .05 alpha level. The relationship between race and the use of sedatives was not significant, with a Chi-square value of .217 and a P-value of .975. Crosstabulations for the use of pain relievers suggest that individuals in the racial category "Other" are most likely to use pain relievers and Black respondents are the least likely to use pain relievers. White respondents are the most likely to use tranquilizers, while Black individuals are the least likely to use them. The same result is observed for the use of stimulants, with White individuals reporting the most use (Table 5).

Cramer's V measures of association were calculated for each of the significant dependent variables on race to determine the strength of the relationships. Extremely weak associations were found between race and all three significant dependent variables. The Cramer's V coefficient for the use of pain relievers was .030, the use of tranquilizers was .057, and the use of stimulants was .052. The results of the statistical analyses can be found in Table 4.

Table 4
Chi-Square Test of Independence and Cramer's V Test of Association for Race

	X^2	df	P-Value	Cramer's V
Analgesics	15.938*	1	.001	.030
Stimulants	49.112*	3	.000	.052
Sedatives	.217	3	.975	N/A
Tranquilizers	58.819*	3	.000	.057

*Significant at the .05 alpha level.

Table 5
Crosstabulation for Prescription Drug Use and Race (Percentage)

	Race			
	White	Black	Hispanic	Other
Pain Reliever Use				
Yes	10.8	8.6	9.9	12.1
No	89.2	91.4	90.1	87.9
Total	100.0	100.0	100.0	100.0
Stimulant Use				
Yes	4.0	1.5	2.6	3.6
No	96.0	98.5	97.4	96.4
Total	100.0	100.0	100.0	100.0
Sedative Use				
Yes	0.9	0.8	0.9	1.0
No	99.1	99.2	99.1	99.0
Total	100.0	100.0	100.0	100.0
Tranquilizer Use				
Yes	3.4	0.8	2.2	2.8
No	96.6	99.2	97.8	97.2
Total	100.0	100.0	100.0	100.0

Hypothesis 3

The third hypothesis in this study tested for a relationship between gender and prescription drug abuse among adolescents. The null hypothesis of no relationship between gender and prescription drug abuse is rejected with the exception of the use of pain relievers. The chi-square test of independence indicated that there was a significant relationship between gender and use of tranquilizers ($x^2 = 9.374$, $p = .002$), sedatives ($x^2 = 6.430$, $p = .011$), and stimulants ($x^2 = 19.223$, $p = .000$). However a significant relationship did not exist between pain relievers ($x^2 = 3.230$, $p = .072$) at the .05 alpha level. The crosstabulations for the three significant tests reveal that females are more likely than males to use tranquilizers, sedatives, and stimulants. The crosstabulation table for pain relievers indicates that the use of pain relievers is almost equally distributed among males and females (Table 7).

The Phi statistic was generated to determine the strength of the significant relationships between gender and the use of tranquilizers, sedatives, and stimulants. All three tests revealed

negative relationships, which indicated that females were more likely to use the prescription drugs than males. However, it must be noted that the strength of the associations between gender and use of stimulants (Phi = .032), sedatives (Phi = .019), and tranquilizers (Phi = .023) were all extremely weak associations. The results for the Chi-square analyses and the measures of association are displayed in Table 6.

Table 6
Chi-square Test of Independence and Phi Test of Association for Gender

	X^2	df	P-Value	Phi
Analgesics	3.230	1	.072	N/A
Stimulants	19.223*	1	.000	.032
Sedatives	6.430*	1	.011	.019
Tranquilizers	9.374*	1	.002	.023

* Significant at the .05 alpha level.

Table 7
Crosstabulation for Prescription Drug Use and Gender (Percentage)

	Gender	
	Males	Females
Pain Reliever Use		
Yes	10.1	10.9
No	89.9	89.1
Total	100.0	100.0
Stimulant Use		
Yes	2.8	4.0
No	97.2	96.0
Total	100.0	100.0
Sedative Use		
Yes	0.7	1.1
No	99.3	98.9
Total	100.0	100.0
Tranquilizer Use		
Yes	2.4	3.1
No	97.6	96.9
Total	100.0	100.0

Table 8 displays the results from the Chi-square analyses for the hypothesis stating that an individual's overall health will share a relationship with prescription drug abuse. The Chi-square test of independence for the four dependent variables indicated that one cell (10%) in each test had expected counts less than 5. For this reason, the Pearson Chi-square analyses must be interpreted with caution. The Chi-square tests were significant for pain relievers ($x^2 = 132.50$, $p = .000$), stimulants ($x^2 = 144.00$, $p = .000$), sedatives ($x^2 = 36.157$, $p = .000$), and tranquilizers ($x^2 = 95.503$, $p = .000$). Because the data used for these analyses included such a large sample size, the significant results could be interpreted as a trend. However, with these results we can cautiously reject the null hypothesis of no relationship between health and prescription drug abuse. The crosstabulations for all four dependent variables suggest that individuals with poor health are more likely to use prescription drugs than individuals in excellent health (Table 9).

In order to determine the strength of the relationships seen in the Chi-square analyses, the Cramer's V statistics was calculated. Weak associations were observed among all four dependent variables with health. The largest association was seen between health and stimulant use with a Cramer's V statistic of .089, and the weakest between health and sedative use with a Cramer's V statistics of .044. However, as previously noted, these results should be interpreted with caution.

Table 8
Chi-square Test of Independence and Cramer's V Test of Association for Health

	X^2	df	P-Value	Cramer's V
Analgesics	132.50[a]*	4	.000	.085
Stimulants	144.00[a]*	4	.000	.089
Sedatives	36.157[a]*	4	.000	.044
Tranquilizers	95.503[a]*	4	.000	.072

[a] 1 cell (10%) had expected counts less than 5.
*Significant at the .05 alpha level.

Table 9
Crosstabulation for Prescription Drug Use and Health (Percentage)

	Overall Health				
	Excellent	Very Good	Good	Fair	Poor
Pain Reliever Use					
Yes	7.6	10.3	13.9	16.9	21.9
No	92.4	89.7	86.1	83.1	78.1
Total	100.0	100.0	100.0	100.0	100.0
Stimulant Use					
Yes	1.8	3.3	5.2	8.0	15.6
No	98.2	96.7	94.8	92.0	84.4
Total	100.0	100.0	100.0	100.0	100.0
Sedative Use					
Yes	0.5	0.9	1.3	2.1	6.2
No	99.5	99.1	98.7	97.9	93.8
Total	100.0	100.0	100.0	100.0	100.0
Tranquilizer Use					
Yes	1.6	2.6	4.4	6.1	6.2
No	98.4	97.4	95.6	93.9	93.8
Total	100.0	100.0	100.0	100.0	100.0

Hypothesis 5

The Chi-square test of independence seen in Table 10 presents results from the analyses to test the hypothesis stating that there is a relationship between school enrollment and prescription drug abuse among adolescents. The null hypothesis of no relationship between school enrollment and prescription drug abuse is rejected based on the Chi-square tests of independence. The Chi-square analysis testing for a relationship between school enrollment and the use of pain relievers was significant with a Chi-square value of 98.557 and a P-value of .000. The relationship between school enrollment and the use of stimulants was also significant with a Chi-square value of 103.90

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and a P-value of .000. Significance was also seen in the relationship between school enrollment and tranquilizer use with a Chi-square value of 132.00 and a P-value of .000. For the relationship between school enrollment and the use of sedatives, the Pearson Chi-square statistics could not be interpreted because 1 cell (25%) had expected counts less than 5. For this reason, the Continuity Correction statistic was interpreted and was found to be significant with a value of 16.832 and a P-value of .000. Crosstabulations for the four dependent variables indicate that individuals who are not enrolled in school are more likely than those who are enrolled in school to use prescription drugs (Table 11).

Another statistical test was performed to determine the strength of the relationships that were found to be significant with the Chi-square analyses. A Phi coefficient was calculated for all four dependent variables with school enrollment. All relationships were seen to have weak associations with school enrollment; pain relievers (Phi = .073), stimulants (Phi = .075), tranquilizers (Phi = .085), and sedatives (Phi = .033). These results can be found in Table 10.

Table 10
Chi-square Test of Independence and Phi Test of Association for School Enrollment

	X^2	df	P-Value	Phi
Analgesics	98.557*	1	.000	.073
Stimulants	103.90*	1	.000	.075
Sedatives	16.832[a][b]*	1	.000	.033
Tranquilizers	132.00*	1	.000	.085

[a] 1 cell (25%) had expected counts less than 5.
[b] Continuity Correction statistic reported and interpreted.
* Significant at the .05 alpha level.

Table 11
Crosstabulation for Prescription Drug Use and School Enrollment (Percentage)

	School Enrollment	
	Yes	No
Pain Reliever Use		
Yes	10.2	29.3
No	89.8	70.7
Total	100.0	100.0
Stimulant Use		
Yes	3.2	14.8
No	96.8	85.2
Total	100.0	100.0
Sedative Use		
Yes	0.9	3.5
No	99.1	96.5
Total	100.0	100.0
Tranquilizer Use		
Yes	2.6	14.5
No	97.4	85.5
Total	100.0	100.0

<u>Hypothesis 6</u>

The sixth hypothesis tested in this study investigated the relationship between prescription drug abuse and previous alcohol use among adolescents. The null hypothesis of no relationship was rejected because significance was found across all four dependent variables in the Chi-square test of independence. Previous alcohol use was found to have a significant relationship with the use of pain relievers ($x^2 = 128.20$, $p = .000$), sedatives ($x^2 = 76.377$, $p = .000$), stimulants ($x^2 = 537.30$, $p = .000$), and tranquilizers ($x^2 = 522.00$, $p = .000$) at the .05 alpha level. All four tests had one degree of freedom. The crosstabulation tables for these analyses suggest that individuals who reported previous alcohol use are more likely than individuals who do not use alcohol to use prescription drugs. This contingency table is displayed in Table 13.

The Phi coefficient was calculated for all four dependent variables to determine the strength of the relationships between previous alcohol use and prescription drug abuse. A moderate association was found between prior alcohol use and the use of pain relievers (Phi = .265),

stimulants (Phi = .171), and tranquilizers (Phi = .169). A moderately weak association was found

between prior alcohol use and the use of sedatives, with a Phi coefficient of .065. The results of

these analyses are displayed in Table 12.

Table 12
Chi-square Test of Independence and Phi Test of Association for Prior Alcohol Use

	X^2	df	P-Value	Phi
Analgesics	128.20*	1	.000	.265
Stimulants	537.30*	1	.000	.171
Sedatives	76.377*	1	.000	.065
Tranquilizers	522.00*	1	.000	.169

*Significant at .05 alpha level.

Table 13
Crosstabulation for Prescription Drug Use and Prior Alcohol Use (Percentage)

	Prior Alcohol Use	
	Yes	No
Pain Reliever Use		
Yes	20.0	3.6
No	80.0	96.4
Total	100.0	100.0
Stimulant Use		
Yes	7.1	0.8
No	92.9	99.2
Total	100.0	100.0
Sedative Use		
Yes	1.6	0.4
No	98.4	99.6
Total	100.0	100.0
Tranquilizer Use		
Yes	6.0	0.4
No	94.0	99.6
Total	100.0	100.0

A Chi-square test of independence was conducted to test the hypothesis stating that there is a relationship between the use of prescription drugs and mental health treatment among adolescents. The null hypothesis of no relationship was rejected because significance was seen at the .05 alpha level across all four dependent variables. The Chi-square analyses identified significant relationships between mental health treatment and the use of pain relievers ($x^2 = 108.50$, $p = .000$), stimulants ($x^2 = 119.80$, $p = .000$), sedatives ($x^2 = 36.104$, $p = .000$), and tranquilizers ($x^2 = 99.908$, $p = .000$). The degrees of freedom for these analyses were 1. As seen in Table 15, the crosstabulations for this relationship suggest that individuals who report being treated for a mental health condition are more likely to abuse prescription drugs than individuals who have not received mental health treatment.

A test to measure the strength of the association between the dependent variables and the independent variable was conducted. The Phi coefficient was calculated for the four dependent variables. All four classes of drugs shared a weak relationship with mental health treatment. The Phi coefficient for the association between mental health treatment and the use of pain relievers was .077, the use of sedatives was .045, the use of stimulants was .081, and the use of tranquilizers was .074 (Table 14).

Table 14
Chi-square Test of Independence and Phi Test of Association for Mental Health Treatment

	X^2	df	P-Value	Phi
Analgesics	108.50*	1	.000	.077
Stimulants	119.80*	1	.000	.081
Sedatives	36.104*	1	.000	.045
Tranquilizers	99.908*	1	.000	.074

*Significant at .05 alpha level.

Table 15

Crosstabulation for Prescription Drug Use and Mental Health Treatment (Percentage)

	Mental Health Treatment	
	Yes	No
Pain Reliever Use		
Yes	17.6	9.6
No	82.4	90.4
Total	100.0	100.0
Stimulant Use		
Yes	7.7	2.8
No	92.3	97.2
Total	100.0	100.0
Sedative Use		
Yes	2.2	0.8
No	97.8	99.2
Total	100.0	100.0
Tranquilizer Use		
Yes	6.4	2.3
No	93.6	97.7
Total	100.0	100.0

Trends of Prescription Drug Abuse

In order to examine trends in prescription drug abuse, data were analyzed across three waves of the survey, from the years 2002, 2004, and 2006. Crosstabulations were performed for all dependent variables with age from each of the three waves of data. By examining the percentages of individuals reporting prescription drug abuse it can be determined whether prescription drug abuse is increasing or decreasing and among what age group.

Table 16 illustrates the results of the crosstabulations. It appears that there was a slight increase in total use of pain relievers, sedatives, and tranquilizers from the year 2002 to 2004. The overall use of stimulants by adolescents decreased slightly. From the year 2004 to 2006 use of all four prescription drugs decreased among the adolescent population. The use of pain relievers was the highest among the prescription drugs with a total of 10.5% of adolescents reporting abuse in 2006. The use of stimulants was the second most commonly abused, with 3.4% of adolescents reporting some form of abuse. Sedatives and tranquilizers were not used by as many, with sedative

use reported by .09% and tranquilizer use reported by 2.8% of the population. This trend of a decrease in use followed by a brief increase was seen among most of the categories, with a few exceptions.

When examining the use of pain relievers, an increase was seen in use among individuals 12 years old between 2004 (3.8%) and 2006 (4.6%). This increase is inconsistent with the trend seen for pain reliever use among the population of adolescents. In addition, the increase in the use of tranquilizers was not identified among 14 and 15 year old respondents between 2002 and 2004. In 2002, individuals 14 years of age reported 1.9% use and in 2004 reported 1.7% use. Respondents 15 years old reported tranquilizer use at 3.8% in 2002 and 3.5% in 2004. Again, this finding is inconsistent with the overall trend for the use of tranquilizers. An increase in the use of stimulants was seen among 12-year-old individuals between 2004 (0.6%) and 2006 (1.2%). The percentage of use among this age group nearly doubled in that 2-year period. Finally, a decrease was seen in the use of sedatives among respondents 17 years old between 2002 (1.6%) and 2004 (1.2%). For individuals 14 years of age, sedative use remained consistent in the 6-year period at 0.9%. These findings are contradictory to the overall trend seen across the three waves of data for adolescent prescription drug abuse.

Table 16

Crosstabulation of Trends of Prescription Drug Abuse (Percentage)

	Total Use Across All Ages		
	2002	2004	2006
Pain Reliever Use			
Yes	10.9	11.5	10.5
No	89.1	88.5	89.5
Total	100.0	100.0	100.0
Stimulant Use			
Yes	4.4	3.9	3.4
No	95.6	96.1	96.6
Total	100.0	100.0	100.0
Sedative Use			
Yes	0.9	1.0	0.9
No	99.1	99.0	99.1
Total	100.0	100.0	100.0
Tranquilizer Use			
Yes	3.2	3.3	2.8
No	96.8	96.7	97.2
Total	100.0	100.0	100.0

Summary

Several of the hypotheses stated in Chapter 1 were supported by the previous statistical analyses. There were only a few exceptions where the null hypothesis could not be rejected. Chi-square analyses revealed relationships between prescription drug abuse and age, health, school enrollment, prior alcohol use, and mental health treatment without any exceptions. The analyses for race and gender provided results indicated significant relationships with three of the four dependent variables.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

The purpose of this study was to examine prescription drug abuse among adolescents and identify characteristics of use, as well as patterns and trends of use. It was predicted that prescription drug abuse among adolescents would share a significant relationship with age, gender, race, overall health, prior alcohol use, school enrollment, and mental health treatment. The direction and strength of these relationships were not predicted. The current researcher's aim was to try to identify characteristics of prescription drug users within the adolescent population.

The data used for this study were obtained from the Inter-university Consortium for Political and Social Research (ICPSR). The Office of Applied Studies within the Substance Abuse and Mental Health Services Administration collected the data. It was collected through the National Survey on Drug Use and Health (NSDUH). The survey collected various pieces of information regarding drug use, health, mental health, and demographic information. Three waves of the survey were used for analysis in the current study. The years 2002, 2004, and 2006 were used to distinguish characteristics of a prescription drug abuser and to identify trends of abuse. Each sample contained a large number of respondents. The year 2002 included 17,709 respondents, the year 2004 had 18,294, and the year 2006 included 18,314 individuals.

Univariate and bivariate analyses were performed on the data. Chi-square analyses were conducted to identify relationships between the independent and dependent variables. After significant relationships were identified, Cramer's V and Phi measures of association were used to determine the strength of the relationship. Crosstabulation contingency tables were also generated for the relationships between the independent and dependent variables to illustrate the direction of the relationship.

Conclusions

Prescription drug abuse has been a rising problem in the United States over the past decade. This research analyzed a 6-year period of data to identify trends and patterns of prescription drug abuse from 2002 to 2006. The result that was anticipated was not seen among the adolescent population. The expected increase in use of prescription drugs was seen between 2002 and 2004; however, it appears that from the year 2004 to the year 2006 there was a decrease in the use of pain relievers, stimulants, tranquilizers, and sedatives. It was also identified that there was an increase in the use of stimulants among individuals 12 years of age. This could be a result of an increase in the number of adolescents being diagnosed and treated for psychiatric conditions, such as Attention-Deficit Hyperactivity Disorder. It is important to note however, that younger individuals were still the least likely to use prescription drugs when compared to older adolescents.

It was predicted in the current study that age would share a relationship with prescription drug abuse among the adolescent population. The findings in this research support that hypothesis, which is consistent with the previous literature. The data demonstrated that as an individual's age increases so does the likelihood that the individual will abuse prescription drugs. The data also suggested that the use of pain relievers was highest among all age groups within the adolescent population. This finding is consistent with other research conducted on the popularity of prescription pain relievers. These findings might suggest that as adolescents get older, they have more opportunities to obtain and abuse prescription drugs. For example, older individuals earn driving privileges, which gives them more freedom and privacy, and also typically have a later curfew than younger adolescents.

Relationships between race and prescription drug abuse were also investigated in this study. Race was found to have a significant relationship with the use of pain relievers, stimulants,

and tranquilizers, but not with the use of sedatives. The data suggested those individuals in the categories White and Other are the most likely to use all four prescription drugs. Black individuals were the least likely to abuse prescription stimulants. These findings are similar to those in previous research, suggesting that the adolescent prescription drug abuser will most commonly be Caucasian.

It was further predicted that gender would share a significant relationship with prescription drug abuse among adolescents. A significant relationship was found between gender and all drugs except for pain relievers. The data demonstrated that females are more likely to use prescription drugs than males, with the exception of pain relievers. The distribution of use among females and males for pain relievers is almost equal. Previous findings are supported by these data, indicating that the use of prescription drugs is more prevalent among females. This finding could be a result of an increase in female psychiatric patients. Females are typically diagnosed more often than males with psychiatric disorders such as depression and anxiety and treated with psychoactive prescription drugs like tranquilizers and sedatives. The absence of a relationship between gender and pain relievers could be because pain relievers are the most widely abused prescription drug among all adolescents.

It was also predicted that the health of an individual would share a relationship with prescription drug abuse. The findings in this research should be interpreted cautiously as a result of issues with sample size and expected counts in a Chi-square analysis. Nevertheless, it was evident from the data that as an individual's health declines, the use of prescription drugs increases. Because of such a large sample size, this could be interpreted as a trend, yet the relationship still exists. There is scarce research available which tests for a relationship between health and prescription drug abuse among adolescents. These findings suggest that individuals in good health

are the least likely to abuse prescription drugs. This conclusion could be a result of the *pop-a-pill* culture that was discussed in previous chapters. Society teaches people that there are medications that can treat any ailment, so adolescents may be self-medicating a medical health issue with prescription drugs.

It was hypothesized that school enrollment would share a significant relationship with adolescent prescription drug abuse. A significant relationship was found to exist in this study. The findings illustrate that individuals who are not enrolled in school are more likely to use prescription drugs. This is consistent with general assumptions regarding the need for adolescents to get an education and the need for positive social reinforcements. Prior research has seldom addressed school enrollment as a contributor to prescription drug abuse; however, many studies have investigated prescription drug abuse among middle and high school student populations so school enrollment was a constant.

The sixth hypothesis predicted that prior alcohol use among adolescents would share a relationship with prescription drug abuse. The hypothesis was supported by the analyses that indicated individuals who reported previous alcohol use were more likely to abuse prescription drugs. Numerous studies have investigated previous alcohol use as a contributor to prescription drug abuse, and the findings of this study are consistent with the previous findings. Prior alcohol use is a factor that influences prescription drug abuse among adolescents. It could be reasoned that this relationship exists because alcohol is considered a gateway drug and leads to additional drug abuse. Peer influences might also address this relationship. If adolescents feel pressure to use alcohol and succumb to that pressure, it stands to reason that the same would also occur with prescription drugs. The relationship between prior alcohol use and prescription drug abuse might

also be explained by adolescents' attitudes towards alcohol and prescription medications as being legal substances, therefore acceptable to use.

Finally, it was predicted that mental health treatment and prescription drug abuse among adolescents would share a significant relationship. The data support this hypothesis across all four dependent variables. The analyses found that individuals who reported receiving mental health treatment were more likely to abuse prescription drugs than individuals who did not receive mental health treatment. These findings are supportive of previous literature on mental health treatment and the abuse of prescription drugs. The relationship between mental health treatment and prescription drugs could be a result of the attitudes shown by mental health professionals. Several medications are often used to try to treat mental health conditions. This could create the misconception amongst teenagers that it is perfectly normal and acceptable to try a variety of prescription medications until the desired effect is achieved. This result is consistent with the self-medication theory and further reinforces the medicinal culture.

<div align="center">Implications for Further Research</div>

Limitations

Although the current study consisted of a nationally representative sample, it is not without limitations. The data used for statistical analyses in this research were self-reported information obtained through a survey. The researcher must rely on the assumption that the information obtained was accurate and truthful. Some of the questions within the survey were sensitive in nature and responses may not be accurate. Another limitation of this study lies within the purpose of this study. The purpose was only to identify characteristics of adolescent prescription drug abusers. Motivations behind prescription drug abuse in the adolescent population cannot be inferred with the current research. Speculations can only be made regarding the reasoning behind

the behavior. Future research could avoid the need for speculation by including survey questions about motivations for use and attitudes regarding prescription drugs.

<u>Recommendations</u>

Future research should be conducted to examine adolescents' attitudes towards prescription drugs and motivations for using prescription drugs. Relationships between race and the use of prescription drugs should also be investigated more thoroughly. In addition, the results of this study suggest a decline in prescription drug abuse from 2004 to 2006. This decline should be further investigated to determine the source of the decrease in prescription drug abuse. Research should also be conducted to evaluate the efficacy of existing antidrug abuse programs for preventing prescription drug abuse.

The problem of prescription drug abuse among adolescents could also be resolved with the creation of additional antiprescription drug programs. These programs could include informational seminars on the effects of abusable prescription drugs and educational information available dealing with the identification of certain drugs. Ideally this type of program should be provided for adolescents, adults, and parents. This type of program could be customized to deal with *pharm* parties and attempt to reduce their allure.

Antidrug laws should also undergo a reform, holding parents and adults responsible if a minor obtains the prescription drugs from the home. If information were provided to adults on effective means of keeping harmful prescription medications away from children and these suggestions were ignored, the adults should be responsible if the child obtains prescription medications from the home and abuses them. This type of carelessness could easily be viewed as another form of parental negligence. Adults and parents may be more prone to guard or dispose of

abusable prescription drugs if they could be held legally responsible if those drugs fell into the hands of minors.

The combination of further research on adolescent prescription drug abuse and the implementation of any of these policies or programs could possibly be an effective tool for combating adolescent prescription drug abuse. Antidrug programs are already in place to warn children about illicit drugs such as marijuana, cocaine, and heroin. The drugs that should be the focus of concern now are the drugs that are being obtained from household medicine cabinets.

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