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Factors That Predict Prescription Opioid Misuse by Type of Healthcare Insurance Coverage

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Abstract

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MBA, South University, 2017

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Doctoral Study Submitted in Partial Fulfillment

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Abstract

The opioid epidemic remains one of the leading causes of unintended deaths in the United States and is still one of the focal points of the public health field. Previous research has increased awareness of the opioid crisis and has focused on sociodemographic factors that may cause or predict prescription opioid misuse. The purpose of this study was to investigate sociodemographic factors that may predict prescription opioid misuse while controlling for healthcare insurance. The theoretical foundation for this secondary data analysis project was the socioecological model using the 2019 National Survey on Drug Use and Health. The population was 56,136 United States citizens who were noninstitutionalized and were age 12 years or older. The overall logistic regression models for the two research questions were significant. Ninth grade completers and individuals who completed 11th grade or 12th grade but did not receive a diploma were higher among the types of opioid misuse groups. With respect to income, individuals making less than $50,000 were about two times more likely to misuse prescription opioids, and Medicare beneficiaries were 1.9 times more likely to misuse prescription opioids compared to any other healthcare insurance company. The findings from this study may lead to positive social change through the development of state and federal equitable laws for healthcare insurance companies. Insurance companies and healthcare professionals may use findings from this study to better assist patients who misuse prescription opioids and to prevent new cases of opioid misuse in hopes of preventing further opioid overdoses and deaths.

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Dedication

I would like to dedicate this research project to family, friends, mentors, high school teachers, college professors, and the brothers of Alpha Phi Alpha Fraternity, Incorporated. These individuals were selfless enough to share an encouraging word, thought, or act of kindness from the beginning of my journey to this very moment. These unique individuals collectively supported me and pushed me when I wanted to give up or was too tired from the late-night studies. Further, I would like to dedicate this study and this degree to my great-grandmother, Mrs. Annie L. Young, who was my motivator, encourager, and prayer partner in life. Still, most importantly, she is my guardian angel in death from 99 years of an incredible and blessed life. Words cannot express how much she has instilled in me the need for continued education.

To my mother, Angela J. Albright, this milestone in my life is solely possible because of your many public and private conversations that yielded unselfish and undying love for your children. Your many sacrifices and midnight talks with God created every opportunity for me to reach further, strive harder, and achieve greater. The sacrifices you made as a single parent have paid off in more ways than you know. You have laid the foundation for your children, your grandchildren, and the decedents thereof. So today is a day of gratefulness and humility for all that you have done.

Finally, to the giants on whose shoulders I stand: for all of your hard work and how you have paved the way for such a time as this; to my ancestors, colleagues in the healthcare and public health sectors, and all who have labored in this field of study, I say "Thank you" for your living was not in vain and your works do follow you. While mere

words can never express my gratitude, I am a divinely blessed individual surrounded by people God placed in my life for this reason and this season. Those who came before me have inevitably left this world a little brighter, the load a little lighter, and the journey a little easier.

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Section 1: Foundation of the Study and Literature Review

The use of opioid prescriptions and the misuse thereof has increased at an alarming rate and has reached lethal levels that have caused an epidemic in the United States (Cochran et al., 2014). As such, the United States has one of the highest mortality rates related to prescription opioid misuse than any other country in the world (Cochran et al., 2014). This abuse of prescription opioid medications has garnered the attention of lawmakers, healthcare professionals, and public health experts (Cochran et al., 2014; Jayawardhana et al., 2018). Many public health professionals have contributed theoretical models to address the opioid pandemic, but the complexities of the opioid crisis have proven to need a multisystem approach (Jalali et al., 2020).

As public health officials have begun to investigate the causal factors into an increase in total opioid (both prescription and nonprescription) misuse, Lin et al. (2018) from the JH Bloomberg School of Public Health argued that the lack of adequate healthcare insurance might be a contributing factor due to the frequency of opioid use and the lack of coverage for patients who may need additional medical treatment (para. 1). More concisely and for patients who were able to obtain pain medication, the researchers posited that the lack of evidence-based practice for utilization management contributed to the pandemic as well (Lin et al., 2018). Dasgupta et al. (2018) conducted an epidemiological experiment that concluded that Black patients received more opioid prescriptions than their White counterparts. Reinhardt (2020) agreed that the lack of a regulatory foundation among the healthcare insurance network attributed to the opioid pandemic (para. 4). Furthermore, Reinhardt stated that only 13 states and the District of

Columbia had taken measures towards eradicating the opioid pandemic (para. 4). However, healthcare insurance companies have imposed more restrictions on nonopioid medications than opioid medications (Cochran et al., 2014; Reinhardt, 2020), such as requirements for prior authorizations (Reinhardt, 2020).

Public health experts have concluded that contributory factors of total opioid misuse include sociodemographic variables such as age, sex, and healthcare insurance type. For example, Cochran (2014) and Jalali et al. (2020) contended that younger patients—between the ages of 18 and 25 years—are more susceptible to opioid misuse than any other sociodemographic group. Jayawardhana et al. (2018) conducted research using healthcare insurance as a covariate. They determined that healthcare insurance could add to the likelihood of opioid addiction for middle-aged White men, but further research would need to be conducted across healthcare insurance types. Blake's (2019) research aligned with the premise of the research conducted by Jayawardhana et al. (2018) in that healthcare insurance rules for opioid prescriptions were not standard and could contribute to the ongoing crisis.

In this section, I discuss background details and the rationale for this study. I further explicate the problem statement and the purpose of the study. From the gaps in the current literature, I formulate research questions by which I addressed these gaps. Finally, the theoretical framework and the nature of the study are discussed. Afterward, I scrutinize the available literature and provide a comprehensive review before concluding with the significance of the study.

Background

Over the past few decades, changes to the United States economy have increased the demand for prescription opioid use to treat pain and chronic ailments (Thombs et al., 2020). Moreover, the opioid epidemic was declared a national public health emergency in 2017 by Health and Human Services (Reinhardt, 2020). However, the provocation of the opioid epidemic started in 1980 when healthcare practitioners were told that opioid medications were virtually nonaddictive (Salmond & Allread, 2019). Both healthcare professionals and pharmaceutical companies capitalized on this short publication to exponentially increase the number of opioids manufactured and prescribed (Salmond & Allread, 2019). There was a significant lack of foundation, which was not evidence-based (Salmond & Allread, 2019). However, the advances in medical science have debunked the notion of the inability not to become addictive (Salmond & Allread, 2019).

The Rise of the Opioid Addiction

The widespread use of prescription opioid medication for pain relief started in the 1970s for patients needing relief from chronic pain (Jalali et al., 2020). During this time, few people had access to or used prescription opioid drugs (Jalali et al., 2020). After the *New England Journal of Medicine* published the fallacy of opioid addiction coupled with increased musculoskeletal pain, the need for consistent pain relief emerged (Dasgupta et al., 2018). Dasgupta et al. (2018) attributed five factors to the rise of opioid addiction: (a) increased expectation of pain relief, (b) increased musculoskeletal pain due to an increase in age, (c) obesity, (d) cancer and increase survival postinjury or accident, and (e) increased surgical complexities. Thus, the number of prescriptions written and dispensed

for prescription opioids increased from 75.5 to 209.5 million from 1999 to 2012 (Jayawardhana et al., 2018). The opioid epidemic commenced after these events (Salmond & Allread, 2019).

The proliferation of prescriptions for opioid medication and its addictive properties led to early nonmedical use of opioid drugs (Jayawardhana et al., 2018). The nonmedical use of opioid drugs and sociodemographic factors such as a family history of alcohol abuse and multidrug use is believed to have given rise to opioid abuse (Cochran et al., 2014). Opioid misuse, which includes opioid abuse, has had staggering effects in the United States and worldwide. Jalali et al. (2020) reported that approximately 12 million Americans misused prescription opioids in 2017, and more than 47,000 people succumbed to opioid-related overdoses in the United States (Jalali et al., 2020). Thombs et al. (2020) stated an increase in the mortality rate from 6.1 per 100,000 people in 1999 to 21.7 people in 2017.

After the increase of prescribing opioid medications and after the opioid epidemic was declared, healthcare insurance companies were targeted to manage or control the number of prescriptions dispensed through regulatory methods (Lin et al., 2018). However, many healthcare insurance companies failed to apply evidence-based practices for dispensing opioid prescriptions (Lin et al., 2018), and many did not offer substance abuse treatments (Blake, 2019). Reinhardt (2020) and Jalali et al. (2020) stated that there were noticeable inconsistencies and that some healthcare insurance companies required prior authorizations for some medications, but even these utilization rules varied from state to state.

Problem Statement

Approximately 12 million people in the United States misused prescription opioids (PO) in 2017 (Jalali et al., 2020); more than 47,000 individuals died from opioid-related incidents in the same year (Jalali et al., 2020). The salient correlates between opioid-related deaths and the rise of the opioid epidemic were a lack of regulated rules at the local, community, and government levels (Jalali et al., 2020). Previous researchers considered quantity dispensing and related sociodemographic variables to be causal factors (Schieber et al., 2020); additional research supported claims that the lack of healthcare insurance parity negatively contributed to the ongoing opioid epidemic (Blake, 2019). Notwithstanding, Jalali et al. (2020) posited a multidimensional problem that caused the opioid epidemic that requires local, state, and federal contributions to mitigate the death and overdose rates.

The literature has supported the socioecological framework (SEM) as the theoretical model for the opioid epidemic (Jalali et al., 2020). Moreover, the literature has provided preventative strategies for the opioid pandemic related to injuries in the workplace that would require PO (Shaw, 2020). Finally, current literature has allowed researchers to investigate sociodemographic variables to predict PO misuse (Cochran et al., 2014). Shaw (2020) recommended mitigating strategies that could be initiated at the local employer level. These strategies could prevent injuries and recognize and train individuals to respond appropriately to possible opioid misuse, treatment, and recovery (Shaw, 2020). Although Shaw (2020) suggested these workforce efforts as a means to eradicate opioid treatment (because these researchers believe most chronic pain is

musculoskeletal pain related to work injuries), Jalali et al. (2020) and Blake (2019) supported the SEM . In addition, Jayawardhana et al. (2018) examined the effects of sociodemographic factors to predict PO misuse while controlling for Medicare and Medicaid healthcare insurance plans. The study was limited to Georgia residents between 18 and 64 years old during 2012 (Jayawardhana et al., 2018).

The literature has provided a substantial reflection of PO misuse's rising cost on the healthcare and economic systems (Cochran et al., 2014). However, healthcare insurance companies have remained reactive to opioid addiction by allowing patients to receive increased PO medications. In contrast, the healthcare insurance companies have sought to find alternative and more cost-effective ways to deal with opioid addiction rather than to proactively pay for preventative measures (Blake, 2019). As a result, the current concerted efforts are still minimal and do not help current patients who are already addicted to the medication (Blake, 2019). Patients who misuse opioid drugs add nearly eight times the amount of debt to the healthcare system as those patients who take opioid medications as prescribed (Cochran et al., 2014).

Cochran et al. (2014) suggested that the increased number of days for which a opioid prescription is written induced the opioid epidemic and that little is known about risk factors leading to opioid abuse. Despite extensive research, the literature does not echo Cochran et al. in that patients who engage in opioid misuse are more likely dependents of a primary insurer. Moreover, little is known about the relationship of sociodemographic factors between PO misuse and multiple types of healthcare insurance (Cochran et al., 2014). Many people have experienced or have died from the lack of

access to opioid prescription treatments and anecdotal medications (Blake,2019, p. 811). Some healthcare insurance companies use quantity limits, step therapy, prior authorizations, or a combination of all three (Lin et al., 2018). Trepman et al. (2020) agreed with Cochran et al. (2014) that socioeconomic factors suggest a discrepancy in access to medical therapy for opioid use. However, more than 90,000 patients out of 500,000 Medicare beneficiaries have been identified to be at severe risk of opioid misuse (Abraham et al., 2019). The United States has a high rate of opioid abuse that is further affected by sociodemographic variables such as sex, age, education, and race (Cochran et al., 2014). Employment status has also been used as a predictor variable (Shaw, 2020) because commercial healthcare insurance from employers may impact current opioid misuse rates among employed patients (Cochran et al., 2014; Shaw, 2020).

While the link between some sociodemographic factors and total opioid misuse is pronounced, the link between causal factors of PO misuse and healthcare insurance is not well understood. Jayawardhana et al. (2018) evaluated this link between opioid misuse and Georgia Medicaid recipients. The findings from Jayawardhana et al.'s study supported that male patients using Georgia Medicaid were given more prescriptions for PO than were females who used the same healthcare insurance. However, the lack of knowledge of other types of healthcare insurance and opioid misuse creates a gap in the literature. Thus, the purpose of my study was to understand if there is a relationship between PO misuse by type of healthcare insurance coverage and if sociodemographic variables predict PO misuse.

Purpose of the Study

The purpose of this quantitative study was to investigate sociodemographic factors that predict PO misuse while controlling for types of healthcare insurance. The literature compared specific and salient covariates of PO misuse that were used in this study as well. Previous studies have used or identified known sociodemographic variables that support an increase in opioid misuse or abuse (Jayawardhana et al., 2018). These variables have been used in previous investigations to either support existing literature or provide an update to predictor variables (Cochran et al., 2014). These sociodemographic variables include sex, educational level, race, income level, and age. In addition, I performed a secondary data analysis on an existing dataset provided in the National Survey on Drug Use and Health (https://www.datafiles.samhsa.gov/study-series/national-survey-drug-use-and-health-nsduh-nid13517). This survey is consistent with existing United States practices, and the information therein is collected by the U.S. government. Finally, I used a dataset that included commonly available healthcare insurance types to examine opioid misuse differences using sociodemographic variables.

This study is unique because the current literature has addressed opioid use disorder (OUD) and PO misuse among Medicaid recipients and Medicare beneficiaries (Jayawardhana et al., 2018), but little has been reviewed using commercially available healthcare insurance (Cochran et al., 2014; Jayawardhana et al., 2018). What is known is that private commercially available healthcare insurance companies insure as many nongeriatric patients as does Medicaid (Blake, 2019). Additionally, Medicaid covers lower-income individuals and families (Blake, 2019; Jayawardhana et al., 2018).

Medicaid patients tend to be overprescribed with opioid medication (Jayawardhana et al., 2018). The available literature contains a gap in understanding how sociodemographic variables predict opioid misuse among multiple types of healthcare insurance (Jayawardhana et al., 2018).

Additional knowledge of how sociodemographic variables affect PO misuse among commercial healthcare insurance payers provides a uniform way for public health professionals to educate physicians (Jayawardhana et al., 2018). This education, suggested by Jayawaardhana et al. (2018), could then be the same education to patients for more effective management and treatment of pain and PO misuse and addiction. Furthermore, this knowledge narrows the gap between Medicaid practices and other healthcare insurance practices to provide parity and consistency in evidence-based practices, cost schedules, prescribing, and OUD (Jayawardhana et al., 2018). Finally, this study can provide more robust prescribing and treatment guidelines using evidence-based data, which could decrease the number of opioid prescriptions written for patients, and the number of PO overdoses and deaths (see Shaw, 2020).

Research Questions and Hypotheses

RQ1—Quantitative: To what extent is type of healthcare insurance correlated with PO misuse?

$H_0 1$: Type of healthcare insurance is not correlated with prescription misuse.

$H_a 1$: Type of healthcare insurance is correlated with prescription misuse.

RQ2—Quantitative: What sociodemographic factors predict PO misuse controlling for type of healthcare insurance?

$H_0 2$: There is no correlation between sociodemographic factors, such as age, sex, race, income level, and educational level, and PO misuse when controlling for type of healthcare insurance.

$H_a 2$: There is a correlation between sociodemographic factors such as age, sex, race, income level, and educational level, and PO misuse when controlling for type of healthcare insurance.

Theoretical Framework

This study's theoretical framework was Dahlberg and Krug's (2002) version of Bronfenbrenner's (1977) SEM (see Centers for Disease Control and Prevention [CDC], 2020). Because this model addresses individual behavior in a multimodal fashion and because the current opioid crisis is a nationwide epidemic, the SEM model simplifies the complex opioid crisis using a logical method (Jalali et al., 2020). This model aims to change the interpersonal, individual, and societal behavior that fosters unwanted behavior (Bronfenbrenner, 1977). The Dahlberg and Krug version details behavioral characteristics interconnected between the four stages: individual, interpersonal, community, and society (Bronfenbrenner, 1977; CDC, 2020; Jalali et al., 2020).

Patients may be predisposed to PO misuse at the individual level due to their sex, race, and age (Jalali et al., 2020). Additionally, nonsociodemographic factors such as exposure to PO medication, the ability to engage in the treatment, and the development of PO misuse may affect patients at the individual level (Shaw, 2020). The interconnectedness between individual and intrapersonal levels can affect unwanted behavior prevention rates (Bronfenbrenner, 1977; CDC, 2020) because personal beliefs

of friends and family and other social groups may affect individual behaviors (Shaw, 2020). Social characteristics like educational level and employment status or level of income may lead to increased opioid misuse because PO is influenced by factors like access to the prescription medication either by paying for it, having healthcare insurance to cover the cost, or having access to PO through other family members and friends (Shaw, 2020). The community level engages with PO misuse through geographical location, access to medications, workplace environment, and the ability to properly dispose of medication (Shaw, 2020). Jayawardhana et al. (2018) stated that individuals in lower socioeconomic classes and inadequate income levels are predisposed to having a higher affinity to PO misuse. Lastly, the production of PO medication, government regulations, and supply and demand are within the societal level of the Dahlberg and Krug (2002) version (as cited in Shaw, 2020; CDC, 2020).

Nature of the Study

The nature of this study was quantitative research using an existing dataset from the 2019 National Survey on Drug Use and Health (available at https://www.datafiles.samhsa.gov/dataset/national-survey-drug-use-and-health-2019-nsduh-2019-ds0001). Because this was a secondary analysis on an existing dataset, all subjects were interviewed in 2019 by the Substance Abuse and Mental Health Service Administration (SAMSHA) staff through the National Survey on Drug Use and Health (NSDUH) and not by me. Subjects used in this study were civilians from a "noninstitutionalized population of the United States aged 12 and older, including residents of noninstitutional group quarters such as college dormitories, group homes,

shelters, rooming houses, and civilians dwelling on military installations" (SAMHSA, para. 3). The study provided insight into whether healthcare insurance type is correlated with PO misuse. Further, the data were analyzed using binary logistic regression to predict PO misuse by type of healthcare insurance, which was the focal point of this doctoral study based on sociodemographic factors (i.e., age, sex, race, income level, and educational level). Finally, I examined the association of sociodemographic variables and PO misuse by available private, public, and commercial healthcare insurances.

Secondary Data Types and Sources of Information

The dataset used in this study was provided by the SAMSHA (n.d.). SAMSHA (n.d.) produces the NSDUH annual datasets (available at https://www.datafiles.samhsa.gov/dataset/national-survey-drug-use-and-health-2019-nsduh-2019-ds0001). In this doctoral study, I used the 2019 dataset downloaded in Version 28.0.1.0 of the Statistical Package for the Social Sciences (SPSS) software. As provided by SAMSHA, the data were de-identified and contained variables on age, sex, race, educational level, PO use, and healthcare insurance types. In addition, NSDUH provided data from previously conducted surveys and insurance claims.

Significance and Potential for Positive Social Change

This doctoral study contributes to the field of public health by providing greater insight into factors that predict PO misuse. In addition, the results of this study can enable public health experts to create strategies that can enable healthcare professionals to use uniformed opioid therapy. Currently, the inconsistencies between public and private healthcare insurance payers fuel the opioid epidemic and limit treatments for patients

(Reinhardt, 2020). It is further expected that the results from this study can enable stakeholders, lawmakers, and insurers to create uniform policies for opioid treatment that apply evidence-based utilization management (see Lin et al., 2018) and rapid access to medical professionals without the fear of associated costs (see Reinhardt, 2020). Lastly, by examining the factors that predict PO misuse, public health professionals can assist congressional leaders in minimizing the inequalities of inadequate coverage and suboptimal performance among insurers (see Blake, 2019, p. 813).

Several studies have been completed that have contributed to mitigating the opioid epidemic; however, most have focused on the sociodemographic aspect alone (Jayawardhana et al., 2018). Very few studies have referenced the problems associated with healthcare insurance and its contributions in prolonging the opioid epidemic. The impact of social change can further provide updates to the study of public health by examining the relationships between types of healthcare insurance and current predictor variables. Jayawardhana et al. (2018) contributed to this topic by providing limited updates specific to Georgia residents and Georgia Medicaid. In this study, I aimed to provide a more impactful and robust analysis across multiple healthcare insurance plans and sociodemographic groups.

Literature Search Strategy

Selected articles related to PO misuse were found using specific keywords that yielded the latest peer-reviewed articles and are described here. The key phrases searched were *prescription opioid misuse, opioid abuse, effects of opioid abuse among insured individuals, sociodemographic variables related to opioid misuse,* and *predictor*

variables for OUD in Medicaid and Medicare patients. All key phrases and keywords were searched starting in the United States National Library of Medicine and the National Center for Biotechnology Information. Other journals, such as the *American Journal of Public Health* and *Journal of Managed Care Specialty Pharmacy*, were found in the Health and Human Services Public Access database.

Literature Review

The topics included in this literature review consist of (a) the origin of the opioid epidemic, (b) the population, (c) healthcare insurance coverage, (d) currently known interventions, (e) social determinants of opioid misuse, (f) the SEM model, and (g) gaps in the literature.

Origin of the Opioid Epidemic

The opioid epidemic commenced around the time an article was published stating that PO were safe to dispense and had little, if any, addictive properties (Salmond & Allread, 2019). The *New England Journal of Medicine* cited researchers who stated that there were only four cases of addiction out of the 11,882 subjects studied and that addiction would be rare from PO (Salmond & Allread, 2019). The pharmaceutical companies and regulatory groups, such as the Joint Commission, capitalized on this publication and stressed the need for physicians to increase writing opioid prescriptions for pain relief (Salmond & Allread, 2019). However, at the time opioids were found to be addictive and caused adverse outcomes, healthcare insurance companies were reluctant to cover preventative treatments (Blake, 2019; Patient Protection and Affordable Care Act, 2018), although there was no uniformity as to which medications were covered and under

which guidelines (Blake, 2019; Jaywardhana et al., 2018; Reinhardt, 2020). Coussens et al. (2019) found that opioids illicit a euphoric feeling that contributes to a better overall mood and rewarding effects of the drug. Additionally, the effects of PO use contributed to hyperkatifeia, the direct opposite feeling of intense negative emotions during opioid withdrawals (Coussens et al., 2019).

Patients' perception of pain became a factor of hospital and medical facility Medicare reimbursement in 2010 (Scher et al., 2018). The Patient Protection and Affordable Care Act (2010) linked survey results of patient satisfaction (including pain) with Medicare reimbursement (Scher et al., 2018); thus, if a patient's perception of treatment for their illness and pain resulted in a low survey rating, the Medicare reimbursement for that facility was also lower than it would have been if the survey results were favorable (Scher et al., 2018). This idea of patient perception of pain treatment originated from Dr. James Campbell's initiative to treat pain as the fifth vital sign (Scher et al., 2018). Scher et al. (2018) emphasized that this initiative also contributed to the opioid epidemic. Zajacova et al. (2021) contended that sociodemographic disparities were salient contributors to the trends of the opioid epidemic.

Population

PO are generally given to patients who have chronic pain, have recently recovered from surgery, or have some form of cancer (CDC, 2017). While opioid misuse is possible among all categories, the population most affected by the opioid epidemic is primarily middle-aged Whites without a college education (Dasgupta et al., 2018). Black patients,

however, tend to receive more opioid prescriptions than their White counterparts (Dasgupta et al., 2018; Jayawardhana et al., 2018). Most patients in this population do not have well-paying jobs—regardless of educational level (Thombs et al., 2020). Notwithstanding, healthcare insurance coverage for opioid prescriptions tends to be evenly split between Medicaid and other healthcare insurance payers (Blake, 2019). Private healthcare insurance carriers cover about the same amount of nonelderly patients as Medicaid (Blake, 2019).

Healthcare Insurance Coverage

The literature has suggested that lower-income, middle-aged White males are among the individuals who are most likely to succumb to the opioid epidemic (Salmond & Allread, 2019). Furthermore, Medicaid is provided for primarily low-income families (Blake, 2019). As such, Jayawardhana et al. (2018) studied trends in the opioid crisis through Georgia Medicaid. The study, however, was limited to Georgia Medicaid recipients. The Patient Protection and Affordable Care Act (2010) attempted to unify healthcare insurance companies—private and government-based—by issuing regulations about substance use and abuse and allowing for prevention methods to be covered (Blake, 2019). However, when the government examined private healthcare insurance companies to handle the opioid epidemic, most were underperforming (Blake, 2019; Reinhardt, 2020).

Lawmakers have understood the need for parity among healthcare insurance companies and have attempted to unify rules of opioid dispensing under the Patient Protection and Affordable Care Act, but the outcome was not as favorable as they had

anticipated (Blake, 2019). Blake (2019) stated that healthcare insurance companies were underperforming in their ability to provide standards and to minimize negative influences for the opioid epidemic and that they may have even attempted to find cheaper alternatives. Medicaid, however, was found to outperform private carriers by providing consistent prescribing guidelines, including day supply limitations and limits on the number of prescriptions a patient is able to receive (Blake, 2019). In addition, Medicaid recipients, who are more likely to live below the federal poverty level (Blake, 2019), were more likely to be prescribed opioids (Jayawardhana et al., 2018). These researchers examined the sociodemographic variables among Georgia Medicaid recipients and opioid misuse (Jayawardhana et al., 2018). Jayawardhnan et al. (2018) indicated that there were significant findings of increased opioid prescriptions provided to male patients who received fee-for-service healthcare insurance as opposed to the female managed care counterparts.

Currently Known Interventions

Public health professionals actively engage in mitigating the opioid epidemic through local, state, and federal laws (Jalali et al., 2020; Salmond & Allread, 2019). The Affordable Care Act established some form of parity through uninformed coverage of preventative measures, including using a prescription drug monitoring program and coverage of substance use disorders (Blake, 2019). Jayawardhana et al. (2018)established reasonable predictor variables for Georgia Medicaid patients, although there are no assumptions that these variables cross over into private and other commercial healthcare insurances. Some healthcare insurance companies cover withdrawal conditions such as

hyperkatifeia (Blake, 2019; Coussens et al., 2019). Even though there have been many concerted efforts to eradicate or mitigate the total opioid epidemic, the crisis continues to worsen to date (Salmond & Allread, 2019). Biologically, patients are building a higher tolerance of fatal levels of opioid medication, more potent opioids are being manufactured, and prescription and synthetic opioids have begun to cross the United States borders (Salmond & Allread, 2019). Salmond and Allread (2019) stated that considerable research is needed in a population health approach.

Sociodemographic Groups of the Opioid Epidemic

As previously stated, the more significant impact of opioid misuse, abuse, and mortality is among middle-aged White males with less than a college education (Salmond & Allread, 2019). Education, however, does not tend to bear much weight on the opioid epidemic, as does income (Thombs et al., 2020). Income inequality is directly related to the opioid epidemic (Thombs et al., 2020). Causal connections have been made between substandard living arrangements, poverty, and working conditions (Dasgupta et al., 2018).

The SEM

Based on the current literature and the current limitations, Salmond and Allread (2019) and Jalali et al. (2020) suggested a theoretical model that effectively uses a multisectoral framework by which each pillar is intra- and inter-disciplinary. Local levels are not supported by individuals who actively experience pain, depression, and a greater affinity for opioid misuse (Jalali et al., 2020). Reduction in demands for opioid prescriptions are addressed at the interpersonal level and must embrace preventative

strategies (Salmond & Allread, 2019). A population health strategy, which was suggested by Salmond and Allread, is better situated through the community level of the SEM and supplies accessibility, prescribers' perception of risk, risk factors for opioid misuse, and other mitigating strategies (Jalali et al., 2020). The underpinned theme for the opioid epidemic is that a multitiered approach to addressing PO abuse necessitates a closer examination (Jalali et al., 2020).

Gaps in the Literature

While Jayawardhana et al. (2018) outlined possible predictor variables for opioid misuse among Georgia Medicaid recipients, researchers have not examined the effects of sociodemographic predictor variables of PO misuse among other types of healthcare insurance. Beyond Jayawardhana et al.'sstudy, the research has not revealed any current findings on how healthcare insurance companies can help contribute successfully to the opioid epidemic. In this doctoral study, I attempted to bridge the gap between the current literature, the Georgia Medicaid study through Jayawardhana et al., and other types of healthcare insurance. This cohesive study successfully contribute to the opioid crisis by better understanding how types of healthcare insurance influence predictions for opioid misuse.

Definitions

Age: Categorized as 12 to 13 years, 14 to 15 years, 16 to 17 years, 18 to 20 years, 21 to 25 years, 26 to 34 years or 35 years or more, as defined in the 2019 NSDUH (SAMHSA, n.d.)

Educational level: Categorized as less than fifth grade completed, sixth grade completed, seventh grade completed, eighth grade completed, ninth grade completed, 10th grade completed, 11th or 12th grade completed no diploma, high school diploma/GED, some college credit but no degree, Associates degree, college graduate or higher, as defined in the 2019 NSDUH (SAMHSA, n.d.).

Healthcare insurance: All covered plans that pay for or assist in paying for health and prescriptive treatments (Blake, 2019). This term includes commercial, private, government (i.e., Tricare, CHAMPVA), Medicare (Parts A, B, C, or D), and all state Medicaid plans. The survey questionnaire asked if the participant was covered by Medicare, private plan, private plan offered through employer, or uninsured.

Hyperkatifeia: Intense negative emotions and symptoms resulting from opioid withdrawals (Coussen et al., 2019).

Income level: Classified as less than $10,000, $10,000 to $29,999, $30,000 to $49,999, and $50,000 or more.

Misuse: Used as a general term to encompass any medication taken other than the way the physician has prescribed or intended for it to be taken, including dose, frequency, duration, or intended party (Cochran et al., 2014; Schieber et al., 2020). The 2019 NSDUH survey asked patients to answer whether their most recent pain relievers were misused, which medications were misused, and how long ago they misused the drug. Follow-up questions asked specifics about the number of days prescriptions were taken in a way the physician did not direct.

Prescription opioids (PO): PO, also known as analgesics, treat pain and are prescribed by physicians (CDC, 2021). PO throughout this study specifically refers to the following medications: Butorphanol, codeine (with or without acetaminophen or aspirin), dihydrocodeine, fentanyl, hydrocodone, hydromorphone, levorphanol, meperidine, morphine, opium, oxycodone, oxymorphone, pentazocine, tapentadol, tramadol, and methadone (Jayawardhana et al., 2018). Each version of these medications (e.g., immediate-release, extended-release, long-acting, sustained release, controlled release, and other versions) is included in this list.

Sociodemographic: Variables specific to sex, education, race, age, and income (Goodyear & Chavanne, 2020). All sociodemographic variables are based on coding from the 2019 NSDUH Codebook (SAMHSA, n.d.)

- Sex is defined as male or female.
- Race is Hispanic or Latino, not Hispanic or Latino, White or Black, Native Hawaiian/Pacific Islander/ Non-Hispanic Asian, or Non-Hispanic more than one race as defined in the 2019 NSDUH (SAMSHA, n.d.)

Total opioid use: The combination of PO and illegal opioid use.

Assumptions

In this study, I assumed that the data amassed in the existing dataset were collected in the typical fashion with usual collection methods as previously outlined by SAMSHA. I also assumed that the data collected were accurate and free from error. Another assumption was that the reporting agencies were objective and diligent in their duty to report data. Another assumption was that the process for de-identifying data was

completed with integrity and to preserve the identification of all respondents. Any data collected through interviews or patient self-reporting was assumed to be truthful and accurate information.

Scope and Delimitations

The potential limitations of these data consist of the imputation of drug variables (i.e., "used oxycodone," "Did not use prescription opioid other than how prescribed") that were not provided in the original survey. These imputed data may have been from the interview, logically assigned, or statistically imputed based on a previous answer to a question. Additionally, the answers provided are subjected to the patients' understanding of the questions and may not necessarily reflect accurate information. Because pain cannot be empirically measured, this study is limited in that there are no data for whether a patient sought relief from excessive pain through the use of non-PO use (e.g., if the patient's prescription ran out before total pain relief was achieved). Because the processes of receiving prescription pain medication through healthcare insurances vary, I assumed there was no policy or federal standard that regulates prescription dispensations. I further assumed that manufacturers do not inform healthcare insurance companies of the risks of using PO. This assumption solidified the need to test healthcare insurances as a sociodemographic factor. I also made the assumption that most patients would not willingly admit to illegal drug use for fear of self-incrimination; thus, this one of the reasons illegal opioid use cannot be accurately measured. Furthermore, this study was cross-sectional rather than longitudinal because patients were not followed and were only interviewed once. In addition, barriers to this doctoral study may exist due to potential

subject identification since the data was de-identified by a third-party government source rather than by me. This did not pose a problem for the institutional review board. Lastly, this doctoral study was limited to national information only. The NSDUH provides data on a national level and does not provide categories for state or regional locations.

Summary and Conclusion

The purpose of this study was to closely examine the relationships between the dependent variable (PO misuse) and the independent variable (types of healthcare insurance) while controlling for covariates (sex, education level, income level, age, and race). According to Jayawardhana et al. (2018), there was a need to continue to examine these relationships beyond Georgia Medicaid and into other types of healthcare insurance. The opioid epidemic continues to worsen, with more patients succumbing to overdoses (Salmond & Allread, 2019), physicians writing for more PO medications (Blake, 2019; Cochran et al., 2014; Reinhardt, 2020), and the lack of parity among healthcare insurance companies (Blake, 2019).

This section described the origin of the opioid epidemic and causal factors that make indelible marks among chronic addicts. Additionally, this section highlighted the gaps in concerted efforts to minimize further damage to the opioid crisis. Finally, this section explicated current findings within the literature, listed research questions and their relative hypotheses, explained the study's nature and significance, and emphasized assumptions and delimitations of this study. Outcomes from this study could contribute favorably to local, regional, and government mitigating efforts, which can lead to positive social change.

Section 2: Research Design and Data Collection

Introduction

The rise of the opioid epidemic was sparked by misinformation in 1980 when healthcare professionals were told that PO were essentially nonaddictive (Salmond & Allread, 2019). The desire to dispense large amounts of opioid medication led to the proliferation of PO medication production and gave rise to its misuse and abuse (Jayawardhana et al., 2018). At the turn of the century, the mortality rate of opioids began to increase (Thombs et al., 2020) and by 2017, the Department of Health and Human Services declared the opioid epidemic a national public health emergency (Reinhardt, 2020).

After the opioid epidemic was declared a public health emergency, healthcare insurance companies were targeted to control the dispensing of opioids through regulatory means but were found to have not been using evidence-based practices in their regulations (Lin et al., 2018). In fact, remarkable inconsistencies among healthcare insurance regulation led to gaps in care and practices from one healthcare insurance company to another and from one state to another state (Jalali et al., 2020).

This study expounded upon current public health research towards PO misuse and factors that may predict further abuse or death. Data in this study were analyzed to assess the effect of sociodemographic factors on PO misuse while controlling for types of healthcare insurance readily available across the United States of America.

Research Design and Rationale

The purpose of this study was to determine what sociodemographic factors would predict PO misuse, and to what extent, while controlling for types of healthcare insurance. I evaluated this association while controlling for age, sex, race, education level, and income level. This section includes information on the study design, methodology, threats to validity, ethical considerations, and the management of data processes.

This study was a cross-sectional observational study as it was most appropriate given the variables and consideration for intervention. Observational studies are studies that allow researchers to observe the effects of risk factors, treatments, and similar diagnoses without regard to changing the exposure group. More specifically classified, this cohort study was better suited because the cohort of this research contained individuals aged 12 years and older who have misused PO. This type of study provides updated information for public health professionals to assess disease incidences and determinants that affect the rate at which people misuse PO. It further allows public health professionals, healthcare professionals, and lawmakers to make informed decisions about the future of medical practices while prescribing opioid medications.

I performed a secondary data analysis on an existing dataset collected by the SAMSHA. These data were collected in the NSDUH that SAMSHA performs each year. Use of this dataset satisfies the requirement of Walden University's Doctor of Public Health program and is cost and time efficient. Because this survey has been used in previous years, there were no issues with reliability, validity, or ethical considerations.

The purpose of this study was to determine if there was an association between types of healthcare insurance (independent variable) and PO misuse (dependent variable). The covariates were age, sex, race, education level, and income level.

Methodology

This study assumed a quantitative research approach whereby a secondary data analysis was completed on an existing dataset. The data included in this study were voluntarily ascertained by subjects who participated in the 2019 version of the NSDUH. This section describes the procedures used to conduct the study and defines the sample population and the techniques used for sampling, as well as data management, threats to validity, and ethical considerations.

Population

This study focused on the population of citizens though the United States who is stratified by education (some or no high school or high school graduate and beyond) and healthcare insurance (have insurance or no insurance). This sampling population permitted a fair representation of all states and the citizens therein as it provided samples from those individuals who have misused or have not misused PO medication as well as those who may or may not have healthcare insurance. Subjects who participated in this study were noninstitutionalized and were age 12 years or older. Any subjects who fell outside of these exclusionary criteria were omitted based on requirements of the NSDUH committee. This dataset included personal data (i.e., age and sex), but no personal identifiable information was found that would link any particular response to a specific

person (i.e., name, social security number, addresses). For this specific research project, I excluded all subjects who had not misused PO.

Sampling and Sampling Procedures

I used purposive sampling of the aggregate data to select subjects who were specific to this research project and were used from the NSDUH, a nationwide survey. The target population was required to meet explicit inclusion criteria to be considered. Using the computer-based survey provided by NSDUH and its field assistances, subjects used in this survey were asked about their willingness to participate and to provide honest and accurate responses concerning sensitive topics such as drug use, abuse, and other behavior. Inclusion criteria for the sample population included individuals who were 12 years or older and who were noninstitutionalized. Additional criteria included subjects who self-reported having used or misused PO. Respondents who endorsed use of any PO were then asked about misuse. For those respondents who acknowledged misuse of any PO, they were then asked detailed questions about the specific type of misuse (e.g., used longer than doctor prescribed, used because of being hooked, lack of sleep, experimentation, or other reasons). Supplementary solicited information included age, sex, race, and healthcare insurance type or types in the case of multiple insureds.

Secondary Data Management

This dataset was available by accessing the SAMSHA website (https://www.datafiles.samhsa.gov/dataset/national-survey-drug-use-and-health-2019-nsduh-2019-ds0001) and was unrestricted to the public. The data contained within were de-identified before the dataset was uploaded to the official website. As such, there were

no impacts or significant threats to any subjects. Further, the required CITI training on human research was completed prior to Walden's Institutional Review Board (IRB) review and approval. All IRB forms were found to be complete and acceptable prior to usage of this dataset. No additional IRB reviews by third parties were required. This source was ideal because it contained all variables and inclusion criteria.

Sample Size

In the 2019 NSDUH, 67,625 subjects responded to the survey, and of the number of respondents, 28,368 individuals used PO medications. Age was categorized as the following: 12 to 13 years, 14 to 15 years, 16 to 17 years, 18 to 20 years, 21 to 25 years, 26 to 34 years, and 35 years or older, respectively. The racial makeup of the study sample was Hispanic, White, Asian, Black, or multiracial. Sex was classified as male or female, only. Although the NSDUH survey asked questions about several types of drugs (pain relievers, tranquilizers, stimulants, and sedatives), this study only focused on medication authorized for pain relief (opioids). Table 1 refers to opioids used in this study, their generic names, and their schedule classification.

Table 1

Common Opioid Pain Relievers, Alternative Brand Names, Their Generic Names and Schedule Classification

Brand name	Generic name	Schedule classification
Vicodin, Lortab, Norco, Zohydro ER	Hydrocodone	Schedule II
Oxycontin, Percocet, Percodan, Roxicodone	Oxycodone	Schedule II
Ultram, Ultracet	Tramadol, Tramadol ER[a]	Schedule IV
Tylenol III[b], Tylenol IV (with codeine)	Acetaminophen with codeine	Schedule III
Avinza, Kadian	Morphine, Morphine ER	Schedule II
Duragesic, Fentora	Fentanyl	Schedule II
Suboxone, Subutex	Buprenorphine, Buprenorphine/naloxone	Schedule III
Opana	Oxymorphone, Oxymorphone ER	Schedule II
Demerol, Dilaudid, Exalgo	Hydromorphone, Hydromorphone ER	Schedule II

Note. This list contains the opioid prescriptions asked about in this survey as well as the ones studied in this project (see Faul et al., 2017; SAMSHA, n.d).

[a] ER is the accepted abbreviation for extended release. [b] Tylenol III and Tylenol IV are not over-the-counter acetaminophen items.

Instrumentation

The NSDUH was conducted in the normal fashion as it has been since 2002 with minimal updates as recent as 2019. This instrument allows respondents to complete the survey using computer-assisted interviewing methods. Minimal assistance was required by a field interviewer. However, field interviewers were positioned to assist respondents if necessary.

This survey was designed to measure the prevalence rates of substance use and mental health. Subjects were asked about subjects' use of legal and illicit drugs, alcohol, and tobacco. Further, subjects were asked detailed questions concerning lifetime use, age of first and last use, and misuse of narcotic pain relievers. Once the subject positively responded to having used any individual PO medication or PO at all, specific questions were prompted for the subject answer concerning specific misuse possibilities.

The Drug Enforcement Agency categorizes controlled substances into five categories (or schedules) ranging from greatest risk of abuse to lowest potential for abuse (Faul et al., 2017):

- Schedule I narcotics are currently illegal in the United States and have no associated medical use (e.g., heroin, or cocaine). These medications have the highest potential for misuse and abuse.
- Schedule II narcotics have a relatively high potential for abuse that could possibly lead to severe dependence. Most opioid pain relievers such as hydrocodone, oxycodone, and fentanyl are in this schedule.

- Schedule III through V narcotics have potential for abuse and dependence that range from limited physical and psychological dependence to moderate dependence. Examples of these medications are some codeine products (Schedule III), alprazolam and other tranquilizers (Schedule IV), and Lyrica (Schedule V).

In this research project, I focused on PO medications that were categorized as Scheduled II, Scheduled III, and Schedule IV prescriptions as reported by respondents in the survey.

Operationalization of Variables

Table 2 is a depiction of the variables used in the analysis as related to the definitions and type of measurement. Statistical information was noted for combined misuse types followed by statistical information for each misuse type individualized. Once these data were collected, misuse types were combined. Data related to combined healthcare insurances (e.g., CAID/CHAMPUS) were evaluated. Similarly, individualized types of healthcare insurance were run against combined misuse and individualized misuse types. Once this information was collected, statistically significant types of healthcare insurance were combined, recoded, and rerun for statistical significance.

Combined types of healthcare insurance and combined types of PO misuse were not individualized in Table 2. Each type of healthcare insurance and subcategory of PO misuse were weighted as either an independent or dependent variable listed below. All data in this study were collected using the established NSDUH computer-assisted survey device. Any assistance offered to subjects was administered by the field assistants through NSDUH and SAMSHA.

Table 2

Operational Definitions of Variables

Name	Type of measurement	Definition	Levels/categories
Age (independent)	Categorical	Years of age at the time of study	12-13 years 14-15 years 16-17 years 18-20 years 21-25 years 26-34 years 35 years and older
Sex (independent)	Categorical	Self-reported sex	Male Female
Race (independent)	Categorical	Reported ethnicity or racial background	Non-Hispanic White Non-Hispanic Black/African American Non-Hispanic Native American/Pacific Islander/Other Non-Hispanic Asian Non-Hispanic more than one race Hispanic
Education level (independent)	Categorical	Highest level of education completed at the time of survey	5th Grade or less 6th Grade or less 7th Grade or less 8th Grade or less 9th Grade or less 10 Grade or less 11th or 12th Grade completed, no diploma High school Diploma/GED Some College Credit, No degree Associate degree College Graduate or higher

Name	Type of measurement	Definition	Levels/categories
Types of healthcare insurance (independent)	Categorical	Healthcare insurance coverage at the time of survey	Medicare Medicaid Tricare, CHAMPUS, CHAMPVA, Veterans' Affairs, Military Private Private Insurance offered through employer or union
Types of misuse (dependent)	Categorical	Self-reported type of prescription opioid misuse	Ever used pain reliever not directed Used oxycontin not directed by Dr Used pain reliever without own Rx Used pain reliever in greater amounts than Rx Used pain reliever more often than Rx Used pain reliever longer than Rx Used pain reliever other way not directed Used last pain reliever (not directed) to relieve pain Used last pain reliever (not directed) to relax Used last pain reliever (not directed) to experiment Used last pain reliever (not directed) to get high Used last pain reliever (not directed) for sleep Used last pain reliever (not directed) for emotions Used last pain reliever (not directed) for other drug effect Used last pain reliever (not directed) because hooked Used last pain reliever (not directed) other reason

Data Analysis Plan

Through the utilization of IBM SPSS version 28, three phases (descriptive statistics, bivariate analysis, logistic regression) of analyses were conducted to evaluate the hypotheses for the RQs:

RQ1—Quantitative: To what extend is type of healthcare insurance correlated with PO misuse?

$H_0 1$: Type of healthcare insurance is not correlated with prescription misuse.

$H_a 1$: Type of healthcare insurance is correlated with prescription misuse.

Statistical plan: Bivariate analysis: Chi-square between "types of healthcare insurance" and "types of misuse". If found to be a significant association, these variables will be used in the logistic regression model.

RQ2—Quantitative: What sociodemographic factors predict PO misuse controlling for type of healthcare insurance?

$H_0 2$: There is no correlation between sociodemographic factors, such as age, sex, race, income level, and educational level, and PO misuse when controlling for type of healthcare insurance.

$H_a 2$: There is a correlation between sociodemographic factors such as age, sex, race, income level, and educational level, and PO misuse when controlling for type of healthcare insurance.

Statistical plan: Multivariate analysis: I conducted a binary logistic regression analysis. The predictor variables were age, sex, race, educational level, income level, and

types of healthcare insurance. The dependent variables were PO misuse and specific types of PO misuse.

Data were coded into the categories as previously described in Table 2.

- Phase 1: Descriptive Statistics: Determine the frequencies and percentages of all variables in this study.
- Phase 2: Bivariate analysis: Utilize Chi-Square tests to determine if there is a significant association between the independent variables, types of healthcare insurance, age, sex, race, education level, and income level) and the dependent variable (PO misuse).
- Phase 3: Binary logistic regression analysis to include all predictor variables and covariates (types of healthcare insurance and sociodemographic factors) of the outcome variable (PO misuse).

Threats to Validity and Reliability

Quantitative research requires the need to have instruments with replicability and accuracy. Reliability measures the extent to which a response can be approximately replicated when using the same instrument (Heale & Twyross, 2015). Homogeneity, Cronbach's α, stability, and equivalence are some of the conventional ways reliability is measured (Heale & Twyross, 2015).

Validity measures the concept of accuracy of an instrument (Heale & Twyross, 2015). Three subcategories of validity are: (a) content validity, (b) construct validity, and (c) criterion validity (Heale & Twyross, 2015). While content validity allows a researcher to assess the ability for an instrument to cover all domains within the research project,

construct validity allows the research to draw inferences from the data received (Heale & Twyross, 2015). Contrarily, criterion validity assesses the instrument's ability to measure data accurately when compared to other instruments that measure the same variables (Heale & Twyross, 2015).

Although this study consisted of a secondary data analysis on an existing dataset, this study considered threats of both internal and external validity. Internal validity is the measure of the elimination of bias (Heale & Twyross, 2015). External validity, however, relies on the merits of the data to be generalized to the population (Heale & Twyross, 2015). This study further considered the reliability of the data based on previous years of use.

Ethical Procedures

All data collected and utilized are available through the SAMSHA website and are open to the public. All ethical considerations were made prior to conducting this study and were an extensive part of standard procedures. Ethical procedures included the acquisition, utilization, manipulation, and retention of all data with respect to the IRB-stipulated completion of the CITI Program course for student researchers which was completed on 22 August 2021. In addition, consideration was given to the potential for risk to participants. All data were downloaded from the government's website and was already de-identified. Because the data was de-identified through the NSDUH, there was no impact on any human subjects or risk of HIPAA violations. Approval to conduct this study was received by Walden's IRB in accordance with current Walden University standard research policies and was without deviation.

Summary

This cross-sectional observational study was conducted by completing a secondary data analysis on an existing dataset. This dataset was compiled from the National Survey on Drug and Health conducted by SAMSHA with data specific to the research questions described. The purpose of this study was to determine what sociodemographic factors predict PO misuse while controlling for types of healthcare insurance. In this study, race, age, sex, education level, and income level were independent variables, while prescription misuse was the dependent variable.

Purposive sampling was conducted using a stratified random sample from the dataset of respondents who admitted to using PO. Inclusion criteria for the sample population consisted of individuals who used PO, misused PO, and who had healthcare insurance. These variables aligned with the current literature and research design. This section discussed the theoretical construct and how the variables operationalized this construct. Lastly, this section discussed the plan for data analyses to test the hypotheses.

Section 3: Presentation of the Results and Findings

Introduction

The purpose of this section is to present the results and findings on the associations between sociodemographic factors and types of PO misuse while controlling for types of healthcare insurance. In addition, this section provides analyses on factors that predict PO misuse while controlling for types of healthcare insurance. Current literature substantiated that PO misuse is associated with sociodemographic factors. The purpose of this study was to evaluate the association of sociodemographic factors and PO misuse while controlling for types of healthcare insurance coverage. These sociodemographic factors include age, sex, race, education level, and income level. The research questions used in this study were designed to determine these associations.

This section is divided into four parts: (a) accessing the data set for secondary data analysis, (b) descriptive characteristics of the study population, (c) chi-square analyses of variables, and (d) logistic regression analyses. I tested two hypotheses in this study. Research Question 1 was tested using chi-square analysis to examine the association of each independent variable in association with the dependent variable and its associated subsets. Research Question 2 was tested using logistic regression to analyze the predictability of PO misuse and its subsets against associated independent variables.

Accessing the Data Set for Secondary Data Analysis

Data analyzed in this study were procured from the NSDUH through the SAMSHA website. Data from this website were downloaded in the SPSS version 28 and were found to be intact, complete, and de-identified. This dataset was then reviewed for

listed variables and cleaned to verify the number of subjects included for this specific research study. Once verified, the dataset was sorted and recoded for further analysis.

Sample Population Focus

The focus of this study was the population of the United States in total. More specifically, the focus of the population was individuals who currently or formally misused PO and were insured. The rationale behind the breadth of this population was to include as many people, geographically, and of various racial, sex, educational, and financial backgrounds. This would afford me the opportunity to stratify the data.

To participate in the 2019 NSDUH survey, participants were required to be at least 12 years of age and noninstitutionalized (SAMSHA, n.d.). Individuals meeting these criteria were further scrutinized to include those patients who were prescribed and misused PO medications. In this study, some of the respondents' initial answers were transformed or recoded into new variables to combine and recategorize some answers including age, education level, and income. On September 16, 2021, I obtained IRB approval from the Walden University IRB Committee (approval no. 09-16-21-0844997). In total, 56,136 participants met the original inclusion criteria and were included in this study.

Descriptive Statistics of the Study Population

The descriptive analyses of all variables considered in this study were collected during 2019. I offer Table 3 as a logical outline for all variables. The variable age groups of this population were primarily between 21 to 25 years old (15.78%) or between 26 to 34 years old (15.32%). Sex was reasonably even with the number of males slightly higher

(50.4%) compared to females (49.6%). Race and ethnicity were homogenous in this study sample, which was primarily dominated by non-Hispanic Whites (57.2%), 19.3% Hispanic, 12.9% non-Hispanic Black/African American, 4.8% Asian, 3.9% multi-racial, 1.3% non-Hispanic Native American/Alaskan Native, and 0.5% non-Hispanic/Other Pacific Islander. Related to education, just under one-fourth of the participants had a high school diploma or equivalent (23.4%), 25.4% had some college credit but did not obtain a degree, and 24% graduated from college or higher. Pertaining to total income, 44.8% of participants made less than $10,000, and about one-fourth made between $10,000 and $29,999 (24.2%). Lastly, participants' healthcare insurance was classified as Medicare, Medicaid/CHIP, Tricare/CHAMPUS/CHAMPVA/VA/Military, private plans through employer or union, or private insurance. More participants were covered under private plan (n = 34,070) and private plan through employer or union (n = 30,301) than any other healthcare insurance plan.

Table 3

Descriptive Statistics of the Sample (N = 56,136)

Variable	*N*	%
Age		
12-13 years old	4,333	7.72
14-15 years old	4,545	8.10
16-17 years old	4,519	8.05
18-20 years old	5,369	9.56
21-25 years old	8,857	15.78
26-34 years old	8,601	15.32
35 or older	19,912	35.47
Sex		
Male	2,634	50.4
Female	2,595	49.6
Race/Ethnicity		
Non-Hispanic White	32,089	57.2
Non-Hispanic Black/African American	7,256	12.9
Non-Hispanic Native Hawaiian/Other Pacific Islander	292	0.5
Non-Hispanic Asian	2,697	4.8
Non-Hispanic More than One Race	2,202	3.9
Hispanic	10,848	19.3
Education		
Fifth grade or less completed	28	0.5
Sixth grade completed	54	1.0
Seventh grade completed	76	1.5
Eighth grade completed	110	2.1
Ninth grade completed	157	3.0
Tenth grade completed	196	3.7
Eleventh or twelfth grade completed, no diploma	339	6.5
High school diploma/GED	1,225	23.4
Some college credit, but no degree	1,329	25.4
Associates Degree	461	8.8
College graduate or higher	1,254	24.0
Income		
Less than $10,000	25,245	44.8
$10,000 to $29,999	13,599	24.2
$30,000 to $49,999	8,094	14.4
$50,000 or more	9,298	16.6

Variable	*N*	%
Healthcare insurance coverage		
Medicare		
No	51,061	91.3
Yes	4,876	8.7
Medicaid/CHIP		
No	42,499	76.3
Yes	13,209	23.7
Tricare, CHAMPUS, CHAMPVA, VA, MILITARY	53,919	96.3
No	2,084	3.7
Yes		
Private plan through employer or union		
No	3,702	10.9
Yes	30,301	89.1
Private Insurance		
No	21,714	38.9
Yes	34,070	61.1

Note. Some respondents did not volunteer some sociodemographic information such as sex or education; therefore, some data are unaccounted.

Prescription Opioid Use and Misuse

Relative to PO use and misuse, about one-half of participants in this study admitted to having a history of using prescription pain relievers (50.53%). Similarly, 48.64% stated they had never used PO, and 0.83% either did not answer or refused to answer. Of the individuals who admitted to using PO, they were then asked about having ever misused PO, which was categorized into 15 different subcategories. A logical outline of PO misuse is summarized in Table 4. Of the individuals who misused PO, the categories of misuse with the highest number of participants were as follows: used last pain reliever (not directed) to relieve pain (n = 1,447), used pain reliever without own Rx

past 12 months (*n* = 1,292), used last pain reliever (not directed) to relax (*n* = 540), and used pain reliever in other way not directed past 12 months (*n* = 505).

Table 4

Prescription Opioid Use and Misuse by Category

Variable	*N*	%
History of prescription opioid use ever		
No	27,302	48.64
Yes	28,368	50.53
Other	466	0.83
Type of prescription opioid misuse		
Used OxyContin not directed by Dr past 12 months		
No	291	48.8
Yes	305	51.2
Used pain reliever without own Rx past 12 months		
No	760	37.0
Yes	1,292	63.0
Used pain reliever in greater amounts than Rx past 12 months		
No	1,680	81.9
Yes	372	18.1
Used pain reliever more often than Rx past 12 months		
No	1,790	87.2
Yes	262	12.8
Used pain reliever longer than Rx past 12 months		
No	1,811	88.3
Yes	241	11.7
Used pain reliever in other way not directed past 12 months		
No	1,547	75.4
Yes	505	24.6
Used last pain reliever (not directed) to relieve pain		
No	668	31.6
Yes	1,447	68.4
Used last pain reliever (not directed) to relax		
No	1,575	74.5
Yes	540	25.5
Used last pain reliever (not directed) to experiment		
No	1,961	92.7
Yes	154	7.3
Used last pain reliever (not directed) to get high		
No	1,644	77.7
Yes	471	22.3
Used last pain reliever (not directed) for sleep		
No	1,772	83.8

Variable	*N*	%
Yes	343	16.2
Used last pain reliever (not directed) for emotions		
No	1,853	87.6
Yes	262	12.4
Used last pain reliever (not directed) for other drug effect		
No	2,053	97.1
Yes	62	2.9
Used last pain reliever (not directed) because hooked		
No	2,042	96.5
Yes	73	3.5
Used last pain reliever (not directed) for other reason		
No	2,026	95.8
Yes	89	4.2

Note. Respondents were individually asked about each misuse category. A respondent having answered yes in one category does not exclude them from answering yes in subsequent categories. This allowed for overlap in several category among misuse.

Chi-Square Analysis of Variables

A chi-square test for association was performed between the independent variables (age, sex, race, education level, income level, and healthcare insurance plans) and the dependent variable of PO misuse (Table 5). To perform the initial crosstabulation, I combined each of the 15 individual subcategories of opioid misuse together to analyze with each sociodemographic variable. Although a crosstabulation with age was not significant as a contributing factor for general opioid misuse, χ^2, (6, 56,136) = 5.159, p = .52, the age range of 35 years or older had the highest number of documented opioid misuse (n = 19,348). Sex, when combined with total misuse, was also not significant for opioid misuse, χ^2, (1, 5,229) = .75, p = .39, with males, 71% (n = 1,869), slightly higher than females, 69.9% (n = 1,813), among opioid misuse. Individualized race categories combined with total misuse were not significant for general opioid misuse, χ^2, (6, 56,136) = 3.25, p = .78, although higher opioid misuse rates were among non-Hispanic Whites, 97.3% (n = 31,213) and Hispanics, 97.2% (n = 10,546). However, the chi-square test for independence indicated that there was a significant association between education and combined total prescription misuse, χ^2, (10, 5,229) = 99.88, $p < 0.001$. Statistically, as education levels increased from fifth grade or less to college graduate or higher, PO misuse was positively correlated. Similar to age and race, income level was not statistically significant for total PO misuse, χ^2, (3, 56,136) = 7.34, p = .06. Of the number of participants who misused PO (n = 54,589), more participants made less than $10,000 ($n$ = 24,449). No individual healthcare insurance plan was statistically significant: Medicare, (1, 55,937) = 0.62, p = .43, Medicaid/CHIP (1,

55,708) = 2.32, p = .13, Tricare/CHAMPUS/CHAMPVA/VA/Military, (1, 56,003) = 0.82, p = .37, private insurance, (1, 55,784) = .11, p = .74, and private insurance through employer or union, (1, 34,003) = .12, p = .73.

Table 5

Bivariate Analysis (Chi-Square) Between Prescription Opioid Misuse and the Independent Variables of the Study

	Opioid misuse					
	No	Yes	Total	χ^2	*p*	Cramer's *V*
	N (%)	*N* (%)				
Total	1,547 (2.8)	54,589 (97.2)	56,136			
Age range				5.159	0.524	0.010
12-13 years old	127 (2.9)	4,206 (97.1)	433			
14-15 years old	105 (2.3)	4,440 (97.7)	4,545			
16-17 years old	128 (2.8)	4,391 (97.2)	4,519			
18-20 years old	140 (2.6)	5,229 (97.4)	5,369			
21-25 years old	239 (2.7)	8,618 (97.3)	8,857			
26-34 years old	244 (2.8)	8,357 (97.2)	8,601			
35 or older	564 (2.8)	19,348 (97.2)	19,912			
Sex				0.748	0.387	0.012
Male	765 (29.0)	1,869 (71.0)	2,634			
Female	782 (30.1)	1,813 (69.9)	2,595			
Race/Ethnicity				3.247	0.777	0.008
Non-Hispanic White	876 (2.7)	31,213 (97.3)	32,089			
Non-Hispanic Black/African American	216 (3.0)	7,040 (97.0)	7,256			
Non-Hispanic Native American/Alaskan Native	21 (2.8)	731 (97.2)	752			
Non-Hispanic Native	5 (1.7)	287 (98.3)	292			

	Opioid misuse					
	No	Yes	Total	χ^2	*p*	Cramer's *V*
	N (%)	*N* (%)				
Total	1,547 (2.8)	54,589 (97.2)	56,136			
Hawaiian/Other Pacific Islander						
Non-Hispanic Asian	72 (2.7)	2,625 (97.3)	2,697			
Non-Hispanic More than One Race	55 (2.5)	2,147 (97.5)	2,202			
Hispanic	302 (2.8)	10,546 (97.2)	10,848			
Education				99.882	<0.001	0.138
Fifth grade or less completed	10 (35.7)	18 (64.3)	28			
Sixth grade completed	25 (46.3)	29 (53.7)	54			
Seventh grade completed	31 (40.8)	45 (59.2)	76			
Eighth grade completed	33 (30.0)	77 (70.0)	110			
Ninth grade completed	72 (45.9)	85 (54.1)	157			
Tenth grade completed	69 (35.2)	127 (64.8)	196			
Eleventh or twelfth grade completed, no diploma	127 (37.5)	212 (62.5)	339			
High school diploma/GED	379 (30.9)	846 (69.1)	1,225			
Some college credit, but no degree	423 (31.8)	906 (68.2)	1,329			
Associates Degree	117 (25.4)	344 (74.6)	461			
College graduate or higher	261 (20.8)	993 (79.2)	1,254			
Income				7.336	0.062	0.011
Less than $10,000	696 (2.8)	24,449 (97.2)	25,145			

	Opioid misuse					
	No	Yes	Total	χ^2	*p*	Cramer's *V*
	N (%)	*N* (%)				
Total	1,547 (2.8)	54,589 (97.2)	56,136			
$10,000 to $29,999	336 (2.5)	13,263 (97.5)	13,599			
$30,000 to $49,999	247 (3.1)	7,847 (96.9)	8,094			
$50,000 or more	268 (2.9)	9,030 (97.1)	9,298			
Healthcare insurance coverage						
Medicare	143 (2.9)	4,733 (97.1)	4,876	0.618	0.432	0.003
Medicaid/CHIP	338 (2.6)	12,871 (97.4)	13,209	2.324	0.127	0.006
Tricare/CHAMPUS /CHAMPVA/VA/ Military	64 (3.1)	2,020 (96.9)	2,084	0.815	0.367	0.004
Private insurance	935 (2.7)	33,135 (97.3)	34,070	0.107	0.744	0.001
Private insurance through employer or union	830 (2.7)	29,471 (97.3)	30,301	0.116	0.733	0.002

Used OxyContin Not Directed by Dr. Past 12 Months

A chi-square test for association was performed between the independent variables (age, sex, race, education level, income level, and healthcare insurance plans) and the subset dependent variable of *Used OxyContin not directed by Dr. past 12 months* (Table 6). A crosstabulation with age was not significant for using OxyContin directed in a way other than how the physician required, χ^2, (6, 596) = 4.145, p = .66; however, 35 years or older (n = 111) and 21 to 25 years old had the highest number of participants in this opioid misuse category. Sex was also not statistically significant in misusing OxyContin in a way other than how the physician directed, χ^2, (1, 596) = 0.87, p = .35, with males (n = 173) having a higher frequency than females (n = 132). Similarly, Non-Hispanic Whites (n = 179) had a higher number of participants than any other race for this subset but was not significant, χ^2, (6, 596) = 5.37, p = .50. Most education levels, however, were found to be statistically significant χ^2, (8, 596) = 18.723, p = .02, for decreased use of OxyContin not directed by the physician within the past 12 months. Because the numbers of participants of fifth grade or less completed, sixth grade completed, seventh grade completed, were low and did not individually contribute to salient findings overall in this category, I collapsed and combined less than fifth grade through seventh grade completed. Nevertheless, from high school diploma/GED through college graduate or higher, the number of participants who admitted to using OxyContin not as directed by physician within the past 12 months were inversely proportional to education level, in general. Income, χ^2, (3, 596) = 3.883, p = .27, and all healthcare insurance plans were not significant for using OxyContin in other ways not directed by

the physician [Medicare, χ^2, (1, 595) = .32, p = .57, Medicaid/CHIP, X^2 , (1, 592) = .56, p = .45, X^2 ,Tricare/CHAMPUS/CHAMPVA/VA/Military, X^2 , (1, 595) = 2.34, p = .13, χ^2, private insurance, (1, 5,963) = .01, p = .93, and χ^2 ,private plan offered through employer or union, χ^2, (1, 363) = 2.76, p = .10]. An overwhelming majority of participants (54%) in this subcategory recorded an income of less than $10,000 (n = 154) and was insured through either a private insurance (n = 186) or private insurance through an employer or union (n = 170).

Table 6

Bivariate Analysis (Chi-Square) Between Independent Variables of the Study and Subcategory Used OxyContin Not Directed by Dr. Past 12 Months

	Used OxyContin not directed by Dr. past 12 months					
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	291 (48.8)	305 (51.2)	596			
Age Range				4.145	0.657	0.083
12-13 years old	26 (53.1)	23 (46.9)	49			
14-15 years old	20 (48.8)	21(51.2)	41			
16-17 years old	16 (35.6)	29 (64.4)	45			
18-20 years old	31 (47.0)	35 (53.0)	66			
21-25 years old	44 (47.8)	48 (52.2)	92			
26-34 years old	40 (51.3)	38 (48.7)	78			
35 or older	114 (50.7)	111 (49.3)	225			
Sex				0.869	0.351	0.038
Male	154 (47.1)	173 (52.9)	327			
Female	137 (50.9)	132 (49.1)	269			
Race/Ethnicity				5.367	0.498	0.095
Non-Hispanic White	174 (49.3)	179 (50.7)	353			
Non-Hispanic Black/African American	39 (50.6)	38 (49.4)	77			
Non-Hispanic Native American/Alaskan Native	2 (20.0)	8 (80.0)	10			

Used OxyContin not directed by Dr. past 12 months						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	291 (48.8)	305 (51.2)	596			
Non-Hispanic Native Hawaiian/Other Pacific Islander	1 (100)	0 (0.0)	1			
Non-Hispanic Asian	13 (50)	13 (50)	26			
Non-Hispanic More than One Race	6 (37.5)	10 (62.5)	16			
Hispanic	56 (49.6)	57 (50.4)	113			
Education				18.723	0.016	0.177
<Fifth to seventh grade completed	6 (46.2)	7 (53.8)	13			
Eighth grade completed	6 (50.0)	6 (50.0)	12			
Ninth grade completed	3 (18.8)	13 (81.3)	16			
Tenth grade completed	10 (52.6)	9 (47.4)	19			
Eleventh or twelfth grade completed, no diploma	26 (53.1)	23 (46.9)	49			
High school diploma/GED	67 (42.1)	92 (57.9)	159			
Some college credit, but no degree	78 (45.6)	93 (54.4)	171			
Associates degree	30 (63.8)	17 (36.2)	47			
College graduate or higher	65 (59.1)	45 (40.9)	110			
Income				3.883	0.274	0.081
Less than $10,000	131 (46.0)	154 (54.0)	285			
$10,000 to $29,999	61 (54.0)	52 (46.0)	113			
$30,000 to $49,999	45 (45.5)	54 (54.5)	99			
$50,000 or more	54 (54.5)	45 (45.5)	99			
Healthcare insurance coverage						

Used OxyContin not directed by Dr. past 12 months						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	291 (48.8)	305 (51.2)	596			
Medicare	30 (45.5)	36 (54.5)	66	0.321	0.571	0.023
Medicaid/CHIP	70 (51.5)	66 (48.5)	136	0.563	0.453	0.031
Tricare/CHAMPUS/CHAMPVA/VA/ Military	12 (66.7)	6 (33.3)	18	2.343	0.126	0.063
Private Insurance	177 (48.8)	186 (51.2)	363	0.008	0.930	0.004
Private insurance through employer or union	152 (47.2)	170 (52.8)	322	2.760	0.097	0.087

Used Pain Reliever Without Own Rx Past 12 Months

A chi-square test for association was performed between the independent variables (age, sex, race, education level, income level, and healthcare insurance plans) and the subset dependent variable of "Used pain reliever without own Rx past 12 months" (Table 7). Most participants for this subcategory were age 35 years or older (n = 462), but age was not significant, χ^2, (6, 2,052) = 7.794, p = .25. Sex was relatively evenly distributed between males (n = 647) and females (n = 645), also was not statistically significant related to this subcategory, χ^2, (1, 2,052) = .02, p = .88. The crosstabulation between race and this dependent subcategory was statistically significant, χ^2, (6, 2,052) = 20.50, p <.001, Hispanics (70.6%) were more likely than any other race to use PO without having a personal prescription written by a physician. Contrarily, Non-Hispanic more than one race (49.4%) were least likely to misuse PO from a prescription that was not intended for them. Remarkably, Non-Hispanic Whites (56%) were dominant in this subcategory (n = 724) followed by Non-Hispanic Blacks (13.3%). Relative to education level, 26% participants either had a high school diploma/GED (n = 340) and 27% had some college credit, but no college degree (n = 353); however, education level was not significant, χ^2, (10, 2,052) = 15.39, p = .12. Income was also not significant, χ^2, (3, 2,052) = 1.08, p = .78, for misusing PO without a prescription written from a physician, albeit 44.7% reported less than $10,000 (n = 578). Lastly, Medicare, χ^2, (1, 2,044) = .05, p = .82, Medicaid/CHIP, χ^2, (1, 2,033) = 1.56, p = .21, Tricare/CHAMPUS/CHAMPVA/VA/Military, χ^2, (1, 2,045) = .28, p = .60, private insurance, χ^2, (1, 2,043 = .1.50, p = .22, and private plan offered through employer or

union, χ^2, (1, 1,232) = 1.13, p = .29, were all not significant misusing PO from a physician-written prescription not intended for themselves. Most participants had either private insurance (n = 788) or private insurance through employer or union (n = 706) in this subcategory as well.

Table 7

Bivariate Analysis (Chi-Square) Between Independent Variables of the Study and Subcategory Used Pain Reliever Without Own Rx Past 12 Months

	Used pain reliever without own Rx past 12 months					
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	760 (37.0)	1,292 (63.0)	2,052			
Age Range				7.794	0.254	0.062
12-13 years old	67 (39.6)	102 (60.4)	169			
14-15 years old	57 (39.9)	86 (60.1)	143			
16-17 years old	65 (39.2)	101 (60.8)	166			
18-20 years old	63 (33.3)	126 (66.7)	189			
21-25 years old	115 (35.9)	205 (64.1)	320			
26-34 years old	97 (31.6)	210 (68.4)	307			
35 or older	296 (39.1)	462 (60.9)	758			
Sex				0.022	0.882	0.003
Male	378 (36.9)	647 (63.1)	1,025			
Female	382 (37.2)	645 (62.8)	1,027			
Race/Ethnicity				20.498	0.002	0.100
Non-Hispanic White	448 (38.2)	724 (61.8)	1,172			
Non-Hispanic Black/African American	96 (35.6)	174 (64.4)	270			
Non-Hispanic Native American/Alaskan	12 (41.4)	17 (58.6)	29			
Non-Hispanic Native Hawaiian/Other Pacific Islander	4 (50.0)	4 (50.0)	8			
Non-Hispanic Asian	42 (44.7)	52 (55.3)	94			
Non-Hispanic More than One Race	41 (50.6)	40 (49.4)	81			

Used pain reliever without own Rx past 12 months						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	760 (37.0)	1,292 (63.0)	2,052			
Hispanic	117 (29.4)	281 (70.6)	398			
Education				15.387	0.119	0.087
Fifth grade or less completed	6 (42.9)	8 (57.1)	14			
Sixth grade completed	10 (33.3)	20 (66.7)	30			
Seventh grade completed	13 (34.2)	25 (65.8)	38			
Eighth grade completed	16 (34.0)	31 (66.0)	47			
Ninth grade completed	30 (34.5)	57 (65.5)	87			
Tenth grade completed	37 (37.4)	62 (62.6)	99			
High school diploma/GED	171 (33.5)	340 (66.5)	511			
Some college credit, but no degree	192 (35.2)	354 (64.8)	546			
Associates degree	72 (46.5)	83 (53.5)	155			
College graduate or higher	150 (42.7)	201 (57.3)	351			
Income				1.078	0.782	0.023
Less than $10,000	348 (37.6)	578 (62.4)	926			
$10,000 to $29,999	175 (38.0)	285 (62.0)	460			
$30,000 to $49,999	116 (36.4)	203 (63.6)	319			
$50,000 or more	121 (34.9)	226 (65.1)	347			
Healthcare insurance coverage						
Medicare	69 (36.3)	121 (63.7)	190	0.053	0.818	0.005
Medicaid/CHIP	182 (39.6)	278 (60.4)	460	1.564	0.211	0.028
Tricare/CHAMPUS/CHAMPVA/VA/ Military	26 (34.2)	50 (65.8)	76	0.276	0.599	0.012

Used pain reliever without own Rx past 12 months						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	760 (37.0)	1,292 (63.0)	2,052			
Private Insurance	444 (36.0)	788 (64.0)	1,232	1.504	0.220	0.027
Private Insurance through Employer or Union	389 (35.5)	706 (64.5)	1,095	1.128	0.288	0.030

Used Pain Reliever in Greater Amounts Than Rx Past 12 Months

A chi-square test for association was performed between the independent variables (age, sex, race, education level, income level, and healthcare insurance plans) and the subset dependent variable of *Used pain reliever in greater amounts than Rx past 12 months* (Table 8). Most participants (39%) for this subcategory were categorized as age 35 years or older (n = 145), but age was not significant, χ^2, (6, 2,052) = 5.76, p = .45) for misusing PO by taking them in greater amounts than originally intended. Likewise, sex was not significant χ^2, (1, 2,052) = 1.27, p = .26), for pain reliever misuse in greater amount than intended from the prescription but more females (52.7%) positively appeared in this subcategory. Education was statistically significant, χ^2, (7, 2,052) = 19.045, p = .01 and was positively correlated for increased education level with participants having used prescription pain relievers in greater amounts than for which the prescription was written. College graduate or higher (13.4%) was notably inversely related in this subcategory than many of the other education levels meaning they were least likely to use PO in greater amounts than how the prescription was intended to be taken. In this subcategory, one-third participants had some college credit, but no degree

(n = 124). Income was not significant for using opioids in greater amounts, χ^2, (3, 2,052) = .35, p = .95. Still, more participants (44.6%) were categorized as earning less than $10,000 (n = 166). Finally, four of the five healthcare insurance plans were not significant for using PO in a larger amount than intended from the physician [Medicare, χ^2, (1, 2,044) = .45, p = .50, Medicaid/CHIP, χ^2, (1, 2,033) = .57, p = .45, Tricare/CHAMPUS/CHAMPVA/VA/Military, χ^2, (1, 2,045) = .68, p = .41, and private insurance, χ^2 (1, 2,043) = .23, p = .63. Contrarily, individuals insured by a private plan offered through employers or union, χ^2, (1, 1,232) = 4.201, p = .04, were more likely to use PO medication in greater amounts than intended by the prescription originally written.

Table 8

Bivariate Analysis (Chi-Square) Between Independent Variables of the Study and Subcategory Used Pain in Greater Amounts Past 12 Months

Used Pain Reliever in greater amounts than Rx past 12 months						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1680 (81.9)	372 (18.1)	2,052			
Age Range				5.760	0.451	0.053
12-13 years old	130 (76.9)	39 (23.1)	169			
14-15 years old	117 (81.8)	26 (18.2)	143			
16-17 years old	135 (81.3)	31 (18.7)	166			
18-20 years old	158 (83.6)	31 (16.4)	189			
21-25 years old	268 (83.8)	52 (16.3)	320			
26-34 years old	259 (84.4)	48 (15.6)	307			
35 or older	613 (80.9)	145 (19.1)	758			
Sex				1.266	0.260	0.025
Male	849 (82.8)	176 (17.2)	1025			
Female	831 (80.9)	196 (19.1)	1027			
Race/Ethnicity				4.827	0.566	0.048
Non-Hispanic White	952 (81.2)	220 (18.8)	1,172			
Non-Hispanic Black/African American	217 (80.4)	53 (19.6)	270			
Non-Hispanic Native American/Alaskan Native	23 (79.3)	6 (20.7)	29			
Non-Hispanic Native Hawaiian/Other Pacific Islander	7 (87.5)	1 (12.5)	8			
Non-Hispanic Asian	74 (78.7)	20 (21.3)	94			

Used Pain Reliever in greater amounts than Rx past 12 months						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1680 (81.9)	372 (18.1)	2,052			
Non-Hispanic More than One Race	68 (84.0)	13 (16.0)	81			
Hispanic	339 (85.2)	59 (14.8)	398			
Education				19.045	0.008	0.096
<5th grade through 8th grade completed	112 (86.8)	17 (13.2)	129			
Ninth grade completed	72 (82.8)	15 (17.2)	87			
Tenth grade completed	84 (84.8)	15 (15.2)	99			
Eleventh or twelfth grade completed, no diploma	149 (85.6)	25 (14.4)	174			
High school diploma/GED	416 (81.4)	95 (18.6)	511			
Some college credit, but no degree	422 (77.3)	124 (22.7)	546			
Associates degree	121 (78.1)	34 (21.9)	155			
College graduate or higher	304 (86.6)	47 (13.4)	351			
Income				0.345	0.951	0.013
Less than $10,000	760 (82.1)	166 (17.9)	926			
$10,000 to $29,999	379 (82.4)	81 (17.6)	460			
$30,000 to $49,999	258 (80.9)	61 (19.1)	319			
$50,000 or more	283 (81.6)	64 (18.4)	347			
Healthcare Insurance Coverage						
Medicare	159 (83.7)	31 (16.3)	190	0.451	0.502	0.015
Medicaid/CHIP	371 (80.7)	89 (19.3)	460	0.574	0.449	0.017
Tricare/CHAMPUS/CHAMPVA/VA/ Military	65 (85.5)	11 (14.5)	76	0.680	0.409	0.018

Used Pain Reliever in greater amounts than Rx past 12 months						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1680 (81.9)	372 (18.1)	2,052			
Private insurance	1013 (82.2)	219 (17.8)	1,232	0.234	0.628	0.011
Private insurance through employer or union	909 (83.0)	186 (17.0)	1,095	4.201	0.040	0.058

Used Pain Reliever More Often Than Rx Past 12 Months

A Chi-square test for association was performed between the independent variables (age, sex, race, education level, income level, and healthcare insurance plans) and the subset dependent variable of *Used pain reliever more often than Rx past 12 months* (Table 9). No p-values were determined to be equal to or less than the .05 threshold. Therefore, I accepted the null hypothesis for this specific subcategory of PO misuse. Table 9 highlights the associated percentages and p-values under this subcategory.

Table 9

Bivariate Analysis (Chi-Square) Between Independent Variables of the Study and Subcategory Used Pain Reliever More Often Than Rx Past 12 Months

	Used Pain Reliever more often than Rx past 12 months					
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,790 (87.2)	262 (12.8)	2,052			
Age Range				4.426	0.619	0.046
12-13 years old	149 (88.2)	20 (11.8)	169			
14-15 years old	127 (88.8)	16 (11.2)	143			
16-17 years old	146 (88.0)	20 (12.0)	166			
18-20 years old	157 (83.1)	32 (16.9)	189			
21-25 years old	282 (88.1)	38 (11.9)	320			
26-34 years old	272 (88.6)	35 (11.4)	307			
35 or older	657 (86.7)	101 (13.3)	758			
Sex				2.069	0.150	0.032
Male	905 (88.3)	120 (11.7)	1,025			
Female	885 (86.2)	142 (13.8)	1,027			
Race/Ethnicity				1.771	0.939	0.029
Non-Hispanic White	1,025 (87.5)	147 (12.5)	1,172			
Non-Hispanic Black/African American	238 (88.1)	32 (11.9)	270			
Non-Hispanic Native American/Alaskan Native	25 (86.2)	4 (13.8)	29			
Non-Hispanic Native Hawaiian/Other Pacific Islander	6 (75.0)	2 (25.0)	8			
Non-Hispanic Asian	82 (87.2)	12 (12.8)	94			
Non-Hispanic More than One Race	69 (85.2)	12 (14.8)	81			

Used Pain Reliever more often than Rx past 12 months						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,790 (87.2)	262 (12.8)	2,052			
Hispanic	345 (86.7)	53 (13.3)	398			
Education				12.089	0.098	0.077
<5th grade through 8th grade completed	117 (90.7)	12 (9.3)	129			
Ninth grade completed	73 (83.9)	14 (16.1)	87			
Tenth grade completed	88 (88.9)	11 (11.1)	99			
Eleventh or twelfth grade completed, no diploma	153 (87.9)	21 (12.1)	174			
High school diploma/GED	442 (86.5)	69 (13.5)	511			
Some college credit, but no degree	467 (85.5)	79 (14.5)	546			
Associates degree	129 (83.2)	26 (16.8)	155			
College graduate or higher	321 (91.5)	30 (8.5)	351			
Income				1.384	0.709	0.026
Less than $10,000	806 (87.0)	120 (13.0)	926			
$10,000 to $29,999	396 (86.1)	64 (13.9)	460			
$30,000 to $49,999	280 (87.8)	39 (12.2)	319			
$50,000 or more	308 (88.8)	39 (11.2)	347			
Healthcare Insurance Coverage						
Medicare	169 (88.9)	21 (11.1)	190	0.554	0.457	0.016
Medicaid/CHIP	398 (86.5)	62 (13.5)	460	0.218	0.641	0.010
Tricare/CHAMPUS/CHAMPVA/VA/ Military	68 (89.5)	8 (10.5)	76	0.355	0.552	0.013
Private insurance	1078 (87.5)	154 (12.5)	1232	0.211	0.646	0.010

Used Pain Reliever more often than Rx past 12 months						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,790 (87.2)	262 (12.8)	2,052			
Private insurance through employer or union	962 (87.9)	133 (12.1)	1095	1.127	0.288	0.030

Used Pain Reliever Longer Than Rx Past 12 Months

A chi-square test for association was performed between the independent variables (age, sex, race, education level, income level, and healthcare insurance plans) and the subset dependent variable of *Used pain reliever longer than Rx past 12 months* (Table 10). Age was not significant for using PO medication longer than directed by the prescription, χ^2, (6, 2,052) = 4.90, p = .56, and 39.4% (n = 95) of participants were 35 years old or older. Second to 35 years or older were those participants who were between 26 and 34 years old (n = 29). Sex, however, was statistically significant for using PO longer than directed by the prescription, χ^2, (1, 2,052) = 5.682, p = .02. Females (n = 138) were more prominent (57.3%) in this subcategory than males (n = 103), which indicates that females are more likely to use PO longer than the prescription is written. Respective of race and ethnicity, Non-Hispanic Whites (n = 138) was larger than any other race, but was also not significant, χ^2, (6, 2,052) = .63, p = 1.0. Hispanics were the second-most prominent (n = 48). Education level was not significant for using PO longer than intended, χ^2, (7, 2,052) = 10.92 p = .14; remarkably, however, the majority (72.6%) of participants in this subcategory either had some college credit, but no degree (n = 66), a college degree or higher (n = 55) or achieve the level of college graduate or higher (n =

54). Moreover, income was also not significant for using PO longer than the physician expected, χ^2, (3, 2,052) = .49, p = .92. Similar to other subcategories, however, most participants (n = 108) fell into the category of Less than $10,000. Medicare, χ^2, (1, 2,044) = .03, p = .87, Tricare/CHAMPUS/CHAMPVA/VA/Military, χ^2, (1, 2,045) = .2.03, p = .16, private insurance, χ^2, (1, 2,043 = 1.35, p = .25, and private plan offered through employer or union, χ^2, (1, 1,232) = .30, p = .59 were all not significant for using pain relievers longer than expected. Medicaid/CHIP, however, was significant for prescription pain relievers being used longer than intended, χ^2, (1, 2,033) = 5.84, p = .016 indicating that Medicaid recipients are more likely to use PO longer than the prescription allows.

Table 10

Bivariate Analysis (Chi-Square) Between Independent Variables of the Study and Subcategory Used Pain Reliever Longer Than Rx Past 12 Months

	Used Pain Reliever longer than Rx past 12 months					
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,811 (88.3)	241 (11.7)	2,052			
Age Range				4.902	0.556	0.049
12-13 years old	144 (85.2)	25 (14.8)	169			
14-15 years old	124 (86.7)	19 (13.3)	143			
16-17 years old	148 (89.2)	18 (10.8)	166			
18-20 years old	171 (90.5)	18 (9.5)	189			
21-25 years old	283 (88.4)	37 (11.6)	320			
26-34 years old	278 (90.6)	29 (9.4)	307			
35 or older	663 (87.5)	95 (12.5)	758			
Sex				5.682	0.017	0.053
Male	922 (90.0)	103 (10.0)	1,025			
Female	889 (86.6)	138 (13.4)	1,027			
Race/Ethnicity				0.633	0.996	0.018
Non-Hispanic White	1,034 (88.2)	138 (11.8)	1,172			
Non-Hispanic Black/African American	240 (88.9)	30 (11.1)	270			
Non-Hispanic Native American/Alaskan	25 (86.2)	4 (13.8)	29			
Non-Hispanic Native Hawaiian/Other Pacific Islander	7 (87.5)	1 (12.5)	8			
Non-Hispanic Asian	82 (87.2)	12 (12.8)	94			
Non-Hispanic More than One Race	73 (90.1)	8 (9.9)	81			

Used Pain Reliever longer than Rx past 12 months						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,811 (88.3)	241 (11.7)	2,052			
Hispanic	350 (87.9)	48 (12.1)	398			
Education				10.918	0.142	0.073
<5th grade through 8th grade completed	116 (89.9)	13 (10.1)	129			
Ninth grade completed	80 (92.0)	7 (8.0)	87			
Tenth grade completed	90 (90.0)	9 (9.1)	99			
Eleventh or twelfth grade completed, no diploma	160 (92.0)	14 (8.0)	174			
High school diploma/GED	456 (89.2)	55 (10.8)	511			
Some college credit, but no degree	480 (87.9)	66 (12.1)	546			
Associates degree	132 (85.2)	23 (14.8)	155			
College graduate or higher	297 (84.6)	54 (15.4)	351			
Income				0.486	0.922	0.015
Less than $10,000	818 (88.3)	108 (11.7)	926			
$10,000 to $29,999	408 (88.7)	52 (11.3)	460			
$30,000 to $49,999	278 (87.1)	41 (12.9)	319			
$50,000 or more	307 (88.5)	40 (11.5)	347			
Healthcare Insurance Coverage						
Medicare	167 (87.9)	23 (12.1)	190	0.027	0.870	0.004
Medicaid/CHIP	421 (91.5)	39 (8.5)	460	5.835	0.016	0.054
Tricare/CHAMPUS/CHAMPVA/VA/ Military	71 (93.4)	5 (6.6)	76	2.027	0.155	0.031
Private insurance	1079 (87.6)	153 (12.4)	1,232	1.349	0.245	0.026

Used Pain Reliever longer than Rx past 12 months						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,811 (88.3)	241 (11.7)	2,052			
Private insurance through employer or union	961 (87.8)	134 (12.2)	1,095	0.298	0.585	0.016

Used Pain Reliever Other Way Not Directed Past 12 Months

A Chi-square test for association was performed between the independent variables (age, sex, race, education level, income level, and healthcare insurance plans) and the subset dependent variable of *Used pain reliever other way not directed past 12 months* (Table 11). No p-values were determined to be equal to or less than the .05 threshold. Therefore, I rejected the alternative hypothesis and accepted the null hypothesis for this specific subcategory of PO misuse. Table 11 highlights the associated percentages and p-values under this subcategory.

Table 11

Bivariate Analysis (Chi-Square) Between Independent Variables of the Study and Subcategory Used Pain Reliever Other Way Not Directed Past 12 Months

	Used Pain Reliever other way not directed past 12 months					
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,547 (75.4)	505 (24.6)	2,052			
Age Range				3.0990	0.678	0.044
12-13 years old	127 (75.1)	42 (24.9)	169			
14-15 years old	105 (73.4)	38 (26.6)	143			
16-17 years old	128 (77.1)	38 (22.9)	166			
18-20 years old	140 (74.1)	49 (25.9)	189			
21-25 years old	239 (74.7)	81 (25.3)	320			
26-34 years old	244 (79.5)	63 (20.5)	307			
35 or older	564 (74.4)	194 (25.6)	758			
Sex				0.630	0.427	0.018
Male	765 (74.6)	260 (25.4)	1,025			
Female	782 (76.1)	245 (23.9)	1,027			
Race/Ethnicity				6.785	0.341	0.058
Non-Hispanic White	876 (74.7)	296 (25.3)	1,172			
Non-Hispanic Black/African American	216 (80.0)	54 (20.0)	270			
Non-Hispanic Native American/Alaskan Native	21 (72.4)	8 (27.6)	29			
Non-Hispanic Native Hawaiian/Other Pacific Islander	5 (62.5)	3 (27.5)	8			
Non-Hispanic Asian	72 (76.6)	22 (23.4)	94			
Non-Hispanic More than One Race	55 (67.9)	26 (32.1)	81			

Used Pain Reliever other way not directed past 12 months						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,547 (75.4)	505 (24.6)	2,052			
Hispanic	302 (75.9)	96 (24.1)	398			
Education	99	30	129			
<5th grade through 8th grade completed	(76.7)	(23.3)				
Ninth grade completed	72 (82.8)	15 (17.2)	87			
Tenth grade completed	69 (69.7)	30 (30.3)	99			
Eleventh or twelfth grade completed, no diploma	127 (73.0)	47 (27.0)	174			
High school diploma/GED	379 (74.2)	132 (25.8)	511			
Some college credit, but no degree	423 (77.5)	123 (22.5)	546			
Associates degree	117 (75.5)	38 (24.5)	155			
College graduate or higher	261 (74.4)	90 (25.6)	351			
Income				2.742	0.433	0.037
Less than $10,000	696 (75.2)	230 (24.8)	926			
$10,000 to $29,999	336 (73.0)	124 (27.0)	460			
$30,000 to $49,999	247 (77.4)	72 (22.6)	319			
$50,000 or more	268 (77.2)	79 (22.8)	347			
Healthcare Insurance Coverage						
Medicare	143 (75.3)	47 (24.7)	190	0.004	0.953	0.001
Medicaid/CHIP	338 (73.5)	122 (26.5)	460	1.070	0.301	0.023
Tricare/CHAMPUS/CHAMPVA/VA/ Military	64 (84.2)	12 (15.8)	76	3.301	0.069	0.040
Private insurance	935 (75.9)	297 (24.1)	1,232	0.361	0.548	0.013

Used Pain Reliever other way not directed past 12 months						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,547 (75.4)	505 (24.6)	2,052			
Private insurance through employer or union	830 (75.8)	265 (24.2)	1,095	0.047	0.8282	0.006

Used Pain Reliever (Not Directed) to Relieve Pain

A chi-square test for association was performed between the independent variables (age, sex, race, education level, income level, and healthcare insurance plans) and the subset dependent variable of *Used pain reliever (not directed) to relieve pain* (Table 12). More participants in this subcategory were categorized as 21-25 years old (n = 225), 26-34 years old (n = 227) or 35 years or older (n = 556). However, age was not significant for using pain relievers in other ways that's not directed to relieve pain, χ^2, (6, 2,115) = 10.62, p = .10. Sex was statistically significant, χ^2 , (1, 2,115) = 17.07, p = <.001, where females were more prominent (n = 768) than males (n = 679) indicating females were more likely to use PO differently than prescribed to relieve pain. In this subcategory, Non-Hispanic Whites were primary (n = 844) and secondary was Non-Hispanic Blacks/African Americans (n = 193). Race/ethnicity was not significant for this subcategory, χ^2, (6, 2,115) = 6.30, p = .39. Educational level, however, was statistically significant, χ^2, (10, 2,115) = 29.01, p = .001, and was positively associated with taking prescription pain relievers not as directed to relieve pain. In this case, as education level increase, so did the likelihood of misusing PO in this subcategory. Most people in this subcategory (51.4%) either had some college credit, but no degree (n = 379) or had a high

school diploma/GED (n = 365). College graduate or higher was a close third at n = 255. Similarly, income level was also statistically significant, χ^2, (6, 2,115) = 11.09, p = .01. Although less than $10,000 was predominant in this subcategory (n = 629), the higher the annual income, the more likely a person is to use pain relievers in ways not directed by their physician. None of the healthcare insurance plans were statistically significant in this subcategory [Medicare, χ^2, (1, 2,107) = .01, p = .93, Medicaid/CHIP, χ^2, (1, 2,096) = 1.52, p = .22, Tricare/CHAMPUS/CHAMPVA/VA/Military, χ^2, (1, 2,108) = .02, p = .89, private insurance, χ^2, (1, 2,106) = 1.20, p = .27, and private plan offered through employer or union, χ^2, (1, 1,275) = .83, p = .36]. Notably, private insurance (n = 885) was predominant in this subcategory.

Table 12

Bivariate Analysis (Chi-Square) Between Independent Variables of the Study and Subcategory Used Pain Reliever (Not Directed) to Relieve Pain

	Used Pain Reliever (not directed) to relieve pain					
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	668 (31.6)	1,447 (68.4)	2,115			
Age Range				3.0990	0.678	0.044
12-13 years old	64 (37.6)	106 (62.4)	170			
14-15 years old	53 (36.6)	92 (63.4)	145			
16-17 years old	63 (36.2)	111 (63.8)	174			
18-20 years old	63 (32.6)	130 (67.4)	193			
21-25 years old	109 (32.6)	225 (67.4)	334			
26-34 years old	92 (28.8)	227 (71.2)	319			
35 or older	224 (28.7)	556 (71.3)	780			
Sex				17.066	<.001	0.090
Male	378 (35.8)	679 (64.2)	1,057			
Female	290 (27.4)	768 (72.6)	1,058			
Race/Ethnicity				6.297	0.391	0.055
Non-Hispanic White	363 (30.1)	844 (69.9)	1,207			
Non-Hispanic Black/African American	89 (31.6)	193 (68.4)	282			
Non-Hispanic Native American/Alaskan	7 (23.3)	23 (76.7)	30			
Non-Hispanic Native Hawaiian/Other Pacific Islander	3 (33.3)	6 (66.7)	9			
Non-Hispanic Asian	30 (31.6)	65 (68.4)	95			
Non-Hispanic more than one race	30 (37.0)	51 (63.0)	81			

Used Pain Reliever (not directed) to relieve pain						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	668 (31.6)	1,447 (68.4)	2,115			
Hispanic	146 (35.5)	265 (64.5)	411			
Education				29.013	0.001	0.117
Fifth grade or less completed	6 (37.5)	10 (62.5)	16			
Sixth grade completed	5 (16.1)	26 (83.9)	31			
Seventh grade completed	14 (31.8)	30 (68.2)	44			
Eighth grade completed	14 (29.2)	34 (70.8)	48			
Ninth grade completed	42 (44.2)	53 (55.8)	95			
Tenth grade completed	44 (42.3)	60 (57.7)	104			
Eleventh or twelfth grade, no diploma	70 (38.5)	112 (61.5)	182			
High school diploma/GED	161 (30.6)	365 (69.4)	526			
Some college credit, but no degree	177 (31.8)	379 (68.2)	556			
Associates degree	35 (22.2)	123 (77.8)	158			
College graduate or higher	100 (28.2)	255 (71.8)	355			
Income				11.092	0.011	0.072
Less than $10,000	323 (33.9)	629 (66.1)	952			
$10,000 to $29,999	158 (33.1)	319 (66.9)	477			
$30,000 to $49,999	99 (30.0)	231 (70.0)	330			
$50,000 or more	88 (24.7)	268 (75.3)	356			
Healthcare insurance coverage						
Medicare	61 (31.3)	134 (68.7)	195	0.008	0.930	0.002

Used Pain Reliever (not directed) to relieve pain						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	668 (31.6)	1,447 (68.4)	2,115			
Medicaid/CHIP	161 (33.9)	314 (66.1)	475	1.518	0.218	0.027
Tricare/CHAMPUS/CHAMPVA/VA/ Military	24 (30.8)	54 (69.2)	78	0.020	0.888	0.003
Private insurance	390 (30.6)	885 (69.4)	1,275	1.195	0.274	0.024
Private insurance through employer or union	351 (31.0)	781 (69.0)	1,132	0.834	0.361	0.026

Used Pain Reliever (Not Directed) to Relax

A chi-square test for association was performed between the independent variables (age, sex, race, education level, income level, and healthcare insurance plans) and the subset dependent variable of *Used pain reliever (not directed) to relax* (Table 13). In this subcategory, the prominent age classification was 35 years or older (n = 191) but was not significant, χ^2, (6, 2,115) = 3.09, p = .80. Sex was also not significant for using pain reliever in other ways not as directed to relax, χ^2, (1, 2,115) = 0.097, p = .76, although males, 50.6%, were slightly higher (n = 273) than females, 49.4% (n = 267). Non-Hispanic Whites, 55.7%, were primary (n = 301) although race was not significant for using PO medication in ways not directed by the physician to relax, χ^2, (6, 2,115) = 2.37, p = .88. Education was also not significant for misusing PO to relax, χ^2, (7, 2,115) = 10.11, p = .4, with 27.6% of participants having some college credit, but no degree (n = 149). Income level was not significant for using PO in other ways than directed to relax, χ^2, (3, 2,115) = 1.56, p = .67, and 46.1% of participants made less than $10,000 (n =

249). None of the healthcare insurance plans were statistically significant in this subcategory [Medicare, χ^2, (1, 2,107) = .31, p = .58, Medicaid/CHIP, χ^2, (1, 2,096) = 1.90, p = .17, Tricare/CHAMPUS/CHAMPVA/VA/Military, χ^2, (1, 2,108) = .59, p = .44, private insurance, χ^2, (1, 2,106 = .003, p = .96, and private plan offered through employer or union, χ^2, (1, 1,275) = .25, p = .62. Notably, private insurance (n = 325) was predominant, 60.2%, in this subcategory also.

Table 13

Bivariate Analysis (Chi-Square) Between Independent Variables of the Study and Subcategory Used Pain Reliever (Not Directed) to Relax

Independent Variables	Used Pain Reliever (not directed) to relax No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,575 (74.5)	540 (25.5)	2,115			
Age Range				3.090	0.797	0.038
12-13 years old	120 (70.6)	50 (29.4)	170			
14-15 years old	104 (71.7)	41 (28.3)	145			
16-17 years old	131 (75.3)	43 (24.7)	174			
18-20 years old	143 (74.1)	50 (25.9)	193			
21-25 years old	254 (76.0)	80 (24.0)	334			
26-34 years old	234 (73.4)	85 (26.6)	319			
35 or older	589 (75.5)	191 (24.5)	780			
Sex				0.097	0.755	0.007
Male	784 (74.2)	273 (25.8)	1,057			
Female	791 (74.8)	267 (25.2)	1,058			
Race/Ethnicity				2.369	0.883	0.033
Non-Hispanic White	906 (75.1)	301 (24.9)	1,207			
Non-Hispanic Black/African American	206 (73.0)	76 (27.0)	282			
Non-Hispanic Native American/Alaskan Native	22 (73.3)	8 (26.7)	30			
Non-Hispanic Native Hawaiian/Other Pacific Islander	8 (88.9)	1 (11.1)	9			
Non-Hispanic Asian	73 (76.8)	22 (23.2)	95			
Non-Hispanic more than one race	58 (71.6)	23 (28.4)	81			

Independent Variables	Used Pain Reliever (not directed) to relax No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,575 (74.5)	540 (25.5)	2,115			
Hispanic	302 (73.5)	109 (26.5)	411			
Education				4.630	0.705	0.047
<5th grade through 8th grade completed	111 (79.9)	28 (20.1)	139			
Ninth grade completed	73 (76.8)	22 (23.2)	95			
Tenth grade completed	81 (77.9)	23 (22.1)	104			
Eleventh or twelfth grade completed, no diploma	135 (74.2)	47 (25.8)	182			
High school diploma/GED	393 (74.7)	133 (25.3)	526			
Some college credit, but no degree	407 (73.2)	149 (26.8)	556			
Associates Ddgree	112 (70.9)	46 (29.1)	158			
College graduate or higher	263 (74.1)	92 (25.9)	355			
Income				1.560	0.669	0.027
Less than $10,000	703 (73.8)	249 (26.2)	952			
$10,000 to $29,999	358 (75.1)	119 (24.9)	477			
$30,000 to $49,999	241 (73.0)	89 (27.0)	330			
$50,000 or more	273 (76.7)	83 (23.3)	356			
Healthcare Insurance Coverage						
Medicare	142 (72.8)	53 (27.2)	195	0.306	0.580	0.012
Medicaid/CHIP	342 (72.0)	133 (28.0)	475	1.902	0.168	0.030
Tricare/CHAMPUS/CHAMPVA/VA/ Military	61 (78.2)	17 (21.8)	78	0.592	0.442	0.017
Private insurance	950 (74.5)	325 (25.5)	1,275	0.003	0.959	0.001

Independent Variables	Used Pain Reliever (not directed) to relax No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,575 (74.5)	540 (25.5)	2,115			
Private insurance through employer or union	841 (74.3)	291 (25.7)	1,132	0.249	0.618	0.014

Used Pain Reliever (Not Directed) to Experiment

A chi-square test for association was performed between the independent variables (age, sex, race, education level, income level, and healthcare insurance plans) and the subset dependent variable of *Used pain reliever (not directed) to experiment* (Table 14). In this subcategory, 37.6% of participants were classified as being 35 years or older (n = 58) although age was not significant, χ^2, (6, 2,115) = 11.02, p = .09. For this subcategory, sex was significant, χ^2, (1, 2,115) = 5.519, p = .02, where males (59.1%) were more likely than females (40.9%) to misuse pain relievers in ways not directed by the physician for the purposes of experimentation. Males were higher (n = 91) in this subcategory than females (n = 63). Race was not statistically significant to contribute towards using pain relievers not directed by the physician to experiment, χ^2, (6, 2,115) = 6.97, p = .32, although Non-Hispanic Whites were among the highest in this subcategory (n = 84). More participants had some college credit, but no degree (n = 39) than those who did not; education was significant, χ^2, (10, 2,115) = 24.42, p = .01, and negatively correlated which indicates that the higher the education level the least likely a person is to misuse PO for the purposes of experimentation not directed by the physician. Income was not significant, χ^2, (3, 2,115) = 1.64, p = .65, with more participants having made less

than $10,000 (n = 70) than not. Still, none of the healthcare insurance plans were statistically significant in this subcategory [Medicare, χ^2, (1, 2,107) = .0002, p = .96, Medicaid/CHIP, χ^2, (1, 2,096) = .22, p = .64, Tricare/CHAMPUS/CHAMPVA/VA/Military, χ^2, (1, 2,108) = .35, p = .55, private insurance, χ^2, (1, 2,106 = 1.08, p = .30, and private plan offered through employer or union, χ^2, (1, 1,275) = 1.66, p = .20. In this category, private insurance (n = 325) was also primary for experimentation.

Table 14

Bivariate Analysis (Chi-Square) Between Independent Variables of the Study and Subcategory Used Pain Reliever (Not Directed) to Experiment

Independent Variables	Used Pain Reliever (not directed) to experiment No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,961 (92.7)	154 (7.3)	2,115			
Age Range				11.020	0.088	0.072
12-13 years old	158 (92.9)	12 (7.1)	170			
14-15 years old	130 (89.7)	15 (10.3)	145			
16-17 years old	154 (88.5)	20 (11.5)	174			
18-20 years old	184 (95.3)	9 (4.7)	193			
21-25 years old	310 (92.8)	24 (7.2)	334			
26-34 years old	303 (95.0)	16 (5.0)	319			
35 or older	722 (92.6)	58 (7.4)	780			
Sex				5.519	0.019	0.051
Male	966 (91.4)	91 (8.6)	1,057			
Female	995 (94.0)	63 (6.0)	1,058			
Race/Ethnicity				6.968	0.324	0.057
Non-Hispanic White	1,123 (93.0)	84 (7.0)	1,207			
Non-Hispanic Black/African American	262 (92.9)	20 (7.1)	282			
Non-Hispanic Native American/Alaskan	25 (83.3)	5 (16.7)	30			
Non-Hispanic Native Hawaiian/Other Pacific Islander	9 (100.0)	0 (0.0)	9			
Non-Hispanic Asian	91 (95.8)	4 (4.2)	95			
Non-Hispanic more than one race	74 (91.4)	7 (8.6)	81			

Independent Variables	Used Pain Reliever (not directed) to experiment No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,961 (92.7)	154 (7.3)	2,115			
Hispanic	377 (91.7)	34 (8.3)	411			
Education				21.976	0.003	0.102
<5th grade through 8th grade completed	130 (93.5)	9 (6.5)	139			
Ninth grade completed	79 (83.2)	16 (16.8)	95			
Tenth grade completed	94 (90.4)	10 (9.6)	104			
Eleventh or twelfth grade, no diploma	162 (89.0)	20 (11.0)	182			
High school diploma/GED	492 (93.5)	34 (6.5)	526			
Some college credit, but no degree	517 (93.0)	39 (7.0)	556			
Associates degree	149 (94.3)	9 (5.7)	158			
College graduate or higher	338 (95.2)	17 (4.8)	355			
Income				1.636	0.651	0.028
Less than $10,000	882 (92.6)	70 (7.4)	952			
$10,000 to $29,999	437 (91.6)	40 (8.4)	477			
$30,000 to $49,999	309 (93.6)	21 (6.4)	330			
$50,000 or more	333 (93.5)	23 (6.5)	356			
Healthcare insurance coverage						
Medicare	181 (92.8)	14 (7.2)	195	0.002	0.963	0.001
Medicaid/CHIP	438 (92.2)	37 (7.8)	475	0.218	0.641	0.010
Tricare/CHAMPUS/CHAMPVA/VA/ Military	71 (91.0)	7 (9.0)	78	0.354	0.552	0.013
Private insurance	1,189 (93.3)	86 (6.7)	1,275	1.077	0299	0.023

Independent Variables	Used Pain Reliever (not directed) to experiment No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,961 (92.7)	154 (7.3)	2,115			
Private insurance through employer or union	1,052 (92.9)	80 (7.1)	1,132	1.664	0.197	0.036

Used Pain Reliever (Not Directed) to Get High

A chi-square test for association was performed between the independent variables (age, sex, race, education level, income level, and healthcare insurance plans) and the subset dependent variable of *Used pain reliever (not directed) to get high* (Table 15). In this subcategory, age was not significant, χ^2, (6, 2,115) = 7.01, p = .32, for using pain relievers not as directed to get high. Remarkably, 50.3% of all participants were classified as 35 years or older (n = 157) and 21-25 years old (n = 80). Sex was significant, χ^2, (1, 2,115) = 12.343, p <.001, indicating males were more likely to use prescription pain relievers to get high than were females. Race was not significant for using PO to get high, χ^2, (6, 2,115) = 6.07, p = .42; yet Non-Hispanic Whites (56.7%) dominated this subcategory as well (n = 267). Education was significant, χ^2, (7, 2,115) = 42.471, p < .001, the salient findings for this subcategory indicates that as education level increases the likelihood of using pain relievers to get high decreases. About one-third (31%) of participants had some college, but no degree (n = 146). Income was not significant, χ^2, (3, 2,115) = 5.047, p = .17, for misusing PO to get high. However, 48.8% of participants in this category also reported less than $10,000. The following healthcare insurance plans were not statistically significant in this subcategory: Medicare, χ^2, (1,

2,107) = .06, p = .81, Tricare/CHAMPUS/CHAMPVA/VA/Military, χ^2, (1, 2,108) = .04, p = .85, and private insurance, χ^2, (1, 2,106) = .20, p = .66. Medicaid/CHIP, χ^2, (1, 2,096) = 5.19, p = .02, and private plans through employer or union, χ^2, (1, 1,275) = 5.77, p = .02, were both significant among the types of healthcare insurance plans. Medicaid/CHIP or a private insurance plan holders through an employer or union are more likely to use pain relievers to get high. In this category, private insurance (n = 278) and private insurance through employer or union (n = 258) were also primary for getting high.

Table 15

Bivariate Analysis (Chi-Square) Between Independent Variables of the Study and Subcategory Used Pain Reliever (Not Directed) to Get High

Independent Variables	Used Pain Reliever (not directed) to get high No N (%)	Yes N (%)	Total	χ^2	p	Cramer's V
Total	1,644 (77.7)	471 (22.3)	2,115			
Age Range				7.010	0.320	0.058
12-13 years old	130 (76.5)	40 (23.5)	170			
14-15 years old	112 (77.2)	33 (22.8)	145			
16-17 years old	125 (71.8)	49 (28.2)	174			
18-20 years old	147 (76.2)	46 (23.8)	193			
21-25 years old	254 (76.0)	80 (24.0)	334			
26-34 years old	253 (79.3)	66 (20.7)	319			
35 or older	623 (79.9)	157 (20.1)	780			
Sex				12.343	<.001	0.076
Male	788 (74.6)	269 (25.4)	1,057			
Female	856 (80.9)	202 (19.1)	1,058			
Race/Ethnicity				6.071	0.415	0.054
Non-Hispanic White	940 (77.9)	267 (22.1)	1,207			
Non-Hispanic Black/African American	231 (81.9)	52 (18.1)	282			
Non-Hispanic Native American/Alaskan Native	25 (83.3)	5 (16.7)	30			
Non-Hispanic Native Hawaiian/Other Pacific Islander	6 (66.7)	3 (33.3)	9			
Non-Hispanic Asian	72 (75.8)	23 (24.2)	95			

Independent Variables	Used Pain Reliever (not directed) to get high No N (%)	Yes N (%)	Total	χ^2	p	Cramer's V
Total	1,644 (77.7)	471 (22.3)	2,115			
Non-Hispanic more than one race	61 (75.3)	20 (24.7)	81			
Hispanic	309 (75.2)	102 (24.8)	411			
Education				42.471	<.001	0.142
<5th grade through 8th grade completed	130 (93.5)	9 (6.5)	139			
Ninth grade completed	69 (72.6)	26 (27.4)	95			
Tenth grade completed	72 (69.2)	32 (30.8)	104			
Eleventh or twelfth grade completed, no diploma	138 (75.8)	44 (24.2)	182			
High school diploma/GED	397 (75.5)	129 (24.5)	526			
Some college credit, but no degree	410 (73.7)	146 (26.3)	556			
Associates degree	132 (83.5)	26 (16.5)	158			
College graduate or higher	296 (83.4)	59 (16.6)	355			
Income				5.047	0.168	0.049
Less than $10,000	722 (75.8)	230 (24.2)	952			
$10,000 to $29,999	375 (78.6)	102 (21.4)	477			
$30,000 to $49,999	257 (77.9)	73 (22.1)	330			
$50,000 or more	290 (81.5)	66 (18.5)	356			
Healthcare insurance coverage						
Medicare	153 (78.5)	42 (21.5)	195	0.056	0.812	0.005
Medicaid/CHIP	351 (73.9)	124 (26.1)	475	5.189	0.023	0.050
Tricare/CHAMPUS/CHAMPVA/VA/ Military	60 (76.9)	18 (23.1)	78	0.036	0.850	0.004

Independent Variables	Used Pain Reliever (not directed) to get high No N (%)	Yes N (%)	Total	χ^2	p	Cramer's V
Total	1,644 (77.7)	471 (22.3)	2,115			
Private insurance	997 (78.2)	278 (21.8)	1,275	0.196	0.658	0.010
Private insurance through employer or union	874 (77.2)	258 (22.8)	1,132	5.774	0.016	0.067

Used Pain Reliever (Not Directed) for Sleep

A chi-square test for association was performed between the independent variables (age, sex, race, education level, income level, and healthcare insurance plans) and the subset dependent variable of *Used pain reliever (not directed) for sleep* (Table 16). In this subcategory, age was not significant for using prescriptions opioids for sleep, χ^2, (6, 2,115) = 8.99, p = .17, with 41.7% of participants in the 35 years or older classification. Similarly, sex was not significant for using pain reliever not as directed for sleep, χ^2, (1, 2,115) = 2.15, p = .14, in this subcategory, but females (n = 184) outnumbered males (n = 159). Race was also not significant, χ^2, (6, 2,115) = 8.22, p = .22, related to taking pain reliever not as directed for sleep. Nearly two-thirds (59.5%) of participants in this category were Non-Hispanic Whites were dominant with race (n = 204) with Hispanic secondary (n = 59). For this subcategory more participants had a high school diploma/GED (n = 84) than any other educational level, but education was not statistically significant, χ^2, (7, 2,115) = 7.921, p = .34. Neither income was significant for misusing PO for sleep, χ^2, (3, 2,115) = 5.32, p = .15, nor any healthcare insurance plan [Medicare, χ^2, (1, 2,107) = 1.19, p = .28), Medicaid/CHIP, χ^2, (1, 2,096) = .84, p = .36,

Tricare/CHAMPUS/CHAMPVA/VA/Military, χ^2, (1, 2,108) = .56, p = .46, private insurance, χ^2, (1, 2,106) = .003, p = .96, and private plan offered through employer or union, χ^2, (1, 1,275) = .07, p = .79].

Table 16

Bivariate Analysis (Chi-Square) Between Independent Variables of the Study and Subcategory Used Pain Reliever (Not Directed) for Sleep

	Used Pain Reliever (not directed) for sleep					
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,772 (83.8)	343 (16.2)	2,115			
Age Range				8.994	0.174	0.065
12-13 years old	140 (82.4)	30 (17.6)	170			
14-15 years old	119 (82.1)	26 (17.9)	145			
16-17 years old	143 (82.2)	31 (17.8)	174			
18-20 years old	168 (87.0)	25 (13.0)	193			
21-25 years old	286 (85.6)	48 (14.4)	334			
26-34 years old	279 (87.5)	40 (12.5)	319			
35 or older	637 (81.7)	143 (18.3)	780			
Sex				2.147	0.143	0.032
Male	898 (85.0)	159 (15.0)	1,057			
Female	874 (82.6)	184 (17.4)	1,058			
Race/Ethnicity				8.221	0.222	0.062
Non-Hispanic White	1,003 (83.1)	204 (16.9)	1,207			
Non-Hispanic Black/African American	237 (84.0)	45 (16.0)	282			
Non-Hispanic Native American/Alaskan Native	27 (90.0)	3 (10)	30			
Non-Hispanic Native Hawaiian/Other Pacific Islander	5 (55.6)	4 (44.4)	9			
Non-Hispanic Asian	78 (82.1)	17 (17.9)	95			
Non-Hispanic more than one race	70 (86.4)	11 (13.6)	81			

Independent Variables	Used Pain Reliever (not directed) for sleep No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,772 (83.8)	343 (16.2)	2,115			
Hispanic	352 (85.6)	59 (14.4)	411			
Education				7.921	0.340	0.061
<5th grade through 8th grade completed	112 (87.8)	17 (12.2)	139			
Ninth grade completed	80 (84.2)	15 (15.8)	95			
Tenth grade completed	89 (85.6)	15 (14.4)	104			
Eleventh or twelfth grade completed, no diploma	143 (78.6)	39 (21.4)	182			
High school diploma/GED	442 (84.0)	84 (16.0)	526			
Some college credit, but no degree	474 (85.3)	82 (14.7)	556			
Associates degree	133 (84.2)	25 (15.8)	158			
College graduate or higher	289 (81.4)	66 (18.6)	355			
Income				5.319	0.150	0.050
Less than $10,000	796 (83.6)	156 (16.4)	952			
$10,000 to $29,999	400 (83.9)	77 (16.1)	477			
$30,000 to $49,999	266 (80.6)	64 (19.4)	330			
$50,000 or more	310 (87.1)	46 (12.9)	356			
Healthcare insurance coverage						
Medicare	158 (81.0)	37 (19.0)	195	1.189	0.276	0.024
Medicaid/CHIP	391 (82.3)	84 (17.7)	475	0.841	0.359	0.020
Tricare/CHAMPUS/CHAMPVA/VA/ Military	63 (80.8)	15 (19.2)	78	0.557	0.455	0.016
Private insurance	1,069 (83.8)	206 (16.2)	1,275	0.003	0.957	0.001

Independent Variables	Used Pain Reliever (not directed) for sleep No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,772 (83.8)	343 (16.2)	2,115			
Private insurance through employer or union	948 (83.7)	206 (16.2)	1,132	0.071	0.790	0.007

Used Pain Reliever (Not Directed) for Emotions

A chi-square test for association was performed between the independent variables (age, sex, race, education level, income level, and healthcare insurance plans) and the subset dependent variable of *Used pain reliever (not directed) for emotions* (Table 17). Age was not significant for using PO in other ways than as directed for emotions, χ^2, (6, 2,115) = 6.13, p = .41, with more participants in the 35 years or older classification (n = 100). However, in this subcategory, sex was significant for using PO not as directed for emotions, χ^2, (1, 2,115) = 3.89, p = .05, where females (55.7%) were more likely to misuse PO not as directed for emotions than males (44.3%). Females were more prominent (n = 146) than males (n = 116). Race was not significant for misusing PO for emotions, χ^2, (6, 2,115) = 2.92, p = .82, with Non-Hispanic Whites (54.6%) with the highest number of participants (n = 143). Moreover, education level was not significant for using PO not as directed for emotions, χ^2, (7, 2,115) = 8.404 p = .13. High school diploma/GED (n = 63) and some college credit, but no degree (n = 65) had the highest number of participants. Income level was also not significant for using pain relievers not as directed for emotions, χ^2, (3, 2,115) = 0.30, p = .50, but more participants (45.8%) were classified as having made less than $10,000 (n = 120) than any other

income group. No healthcare insurance plan [Medicare, χ^2, (1, 2,107) = .42, p = .52, Medicaid/CHIP, χ^2, (1, 2,096) = .65, p = .42, Tricare/CHAMPUS/CHAMPVA/VA/Military, χ^2, (1, 2,108) = .87, p = .35, private insurance, χ^2, (1, 2,106) = .1.18, p = .29, and private plan offered through employer or union, χ^2, (1, 1,275) = .05, p = .82] was significant for using PO in other ways for emotions.

Table 17

Bivariate Analysis (Chi-Square) Between Independent Variables of the Study and Subcategory Used Pain Reliever (Not Directed) for Emotions

	Used Pain Reliever (not directed) for emotions					
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,853 (87.6)	262 (12.4)	2,115			
Age Range				6.133	0.408	0.054
12-13 years old	153 (90.0)	17 (10.0)	170			
14-15 years old	120 (82.8)	25 (17.2)	145			
16-17 years old	150 (86.2)	24 (13.8)	174			
18-20 years old	172 (89.1)	21 (10.9)	193			
21-25 years old	292 (87.4)	42 (12.6)	334			
26-34 years old	286 (89.7)	33 (10.3)	319			
35 or older	680 (87.2)	100 (12.8)	780			
Sex				3.889	0.049	0.043
Male	941 (89.0)	116 (11.0)	1,057			
Female	912 (86.2)	146 (13.8)	1,058			
Race/Ethnicity				2.916	0.819	0.037
Non-Hispanic White	1,064 (88.2)	143 (11.8)	1,207			
Non-Hispanic Black/African American	244 (86.5)	38 (13.5)	282			
Non-Hispanic Native American/Alaskan Native	24 (80.0)	6 (20.0)	30			
Non-Hispanic Native Hawaiian/Other Pacific Islander	8 (88.9)	1 (11.1)	9			
Non-Hispanic Asian	82 (86.3)	13 (13.7)	95			
Non-Hispanic more than one race	69 (85.2)	12 (14.8)	81			

Used Pain Reliever (not directed) for emotions						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,853 (87.6)	262 (12.4)	2,115			
Hispanic	362 (88.1)	49 (11.9)	411			
Education				8.404	0.298	0.063
<5th grade through 8th grade completed	123 (88.5)	16 (11.5)	139			
Ninth grade completed	84 (88.4)	11 (11.6)	95			
Tenth grade completed	82 (78.8)	22 (21.2)	104			
Eleventh or twelfth grade completed, no diploma	157 (86.3)	25 (13.7)	182			
High school diploma/GED	463 (88.0)	63 (12.0)	526			
Some college credit, but no degree	491 (88.3)	65 (11.7)	556			
Associates degree	139 (88.0)	19 (12.0)	158			
College graduate or higher	314 (88.5)	41 (11.5)	355			
Income				2.415	0.491	0.034
Less than $10,000	832 (87.4)	120 (12.6)	952			
$10,000 to $29,999	412 (86.4)	65 (13.6)	477			
$30,000 to $49,999	289 (87.6)	41 (12.4)	330			
$50,000 or more	320 (89.9)	36 (10.1)	356			
Healthcare insurance coverage						
Medicare	168 (86.2)	27 (13.8)	195	0.421	0.516	0.014
Medicaid/CHIP	411 (86.5)	64 (13.5)	475	0.646	0.018	0.422
Tricare/CHAMPUS/CHAMPVA/VA/ Military	71 (91.0)	7 (9.0)	78	0.867	0.352	0.020
Private insurance	1,125 (88.2)	150 (11.8)	1,275	1.175	0.278	0.024

Used Pain Reliever (not directed) for emotions						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	1,853 (87.6)	262 (12.4)	2,115			
Private insurance through employer or union	998 (88.2)	134 (11.8)	1,132	0.051	0.821	0.006

Used Pain Reliever (Not Directed) for Other Drug Effect

A Chi-square test for association was performed between the independent variables (age, sex, race, education level, income level, and healthcare insurance plans) and the subset dependent variable of *Used pain reliever (not directed) for other drug effect* (Table 18). Age was not significant for using pain relievers not as directed for other drug effects, χ^2, (6, 2,115) = 5.66, p = .46, with more participants (40.3%) in the 35 years or older classification (n = 25). Sex was statistically significant for using prescription pain relievers not as directed for other drug effects, χ^2, (6, 2,115) = 6.63, p = .01, indicating that females (66.1%) were more likely to use pain relievers for other non-specific drug effects than males (33.9%). Females were among the highest in this subcategory (n = 41). Although race was not significant, χ^2, (6, 2,115) = 5.34, p = .50, Non-Hispanic Whites (58.1%) were among the highest in this group (n = 39). Due to the low number of participants who self-identified as having used PO in other ways not as directed by the physician for other drug effect, and due to the low education level numbers in less than fifth through tenth grades completed, these categories were collapsed to produce salient data to analyze. However, education was not significant for using pain relievers not as directed for other drug effect, χ^2, (5, 2,115) = 7.836, p = .17,

with 53.2% being classified as either high school diploma (n = 20) and some college credit, but no degree (n = 13) among the education classification of most participants in this subcategory. Income was also not significant for using pain relievers in other ways not directed for other drug effects, χ^2, (3, 2,115) = 2.62, p = .45. Among healthcare insurance plans, private insurance was the only insurance statistically significant in this subcategory, χ^2, (1, 2,106) = 6.23, p = .01, which indicates that those individuals with a private healthcare insurance plan were more likely to use PO in other ways not directed by the physician for other drug effects. Medicare, χ^2, (1, 2,107) = .1.01, p = .31, Medicaid/CHIP, χ^2, (1, 2,096) = .40, p = .53, Tricare/CHAMPUS/CHAMPVA/VA/Military, χ^2, (1, 2,108) = .78, p = .38, and private plan offered through employer or union, χ^2, (1, 1,275) = .02, p = .90, were all not significant. Remarkably, more participants had private insurance (n = 47) or private insurance though employer or union (n = 42), than any other insurance plan.

Table 18

Bivariate Analysis (Chi-Square) Between Independent Variables of the Study and Subcategory Used Pain Reliever (Not Directed) Other Drug Effect

Independent Variables	Used Pain Reliever (not directed) other drug effect No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	2,053 (97.1)	62 (2.9)	2,115			
Age Range				5.658	0.463	0.052
12-13 years old	164 (96.5)	6 (3.5)	170			
14-15 years old	141 (97.2)	4 (2.8)	145			
16-17 years old	166 (95.4)	8 (4.6)	174			
18-20 years old	190 (98.4)	3 (1.6)	193			
21-25 years old	323 (96.7)	11 (3.3)	334			
26-34 years old	314 (98.4)	5 (1.6)	319			
35 or older	755 (96.8)	25 (3.2)	780			
Sex				6.627	0.010	0.056
Male	1,036 (98.0)	21 (2.0)	1,057			
Female	1,017 (96.1)	41 (3.9)	1,058			
Race/Ethnicity				5.341	0.501	0.050
Non-Hispanic White	1,168 (96.8)	39 (3.2)	1,207			
Non-Hispanic Black/African American	278 (98.6)	4 (1.4)	282			
Non-Hispanic Native American/Alaskan Native	29 (96.7)	1 (3.3)	30			
Non-Hispanic Native Hawaiian/Other Pacific Islander	9 (100.0)	0 (0.0)	9			
Non-Hispanic Asian	94 (98.9)	1 (1.1)	95			

Used Pain Reliever (not directed) other drug effect						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	2,053 (97.1)	62 (2.9)	2,115			
Non-Hispanic more than one race	77 (95.1)	4 (4.9)	81			
Hispanic	398 (96.8)	13 (3.2)	411			
Education				.836	0.166	0.061
<5th grade through 10th grade completed	330 (97.6)	8 (2.4)	338			
Eleventh or twelfth grade completed, no diploma	172 (94.5)	10 (5.5)	182			
High school diploma/GED	506 (96.2)	20 (3.8)	526			
Some college credit, but no degree	543 (97.7)	13 (2.3)	556			
Associates degree	155 (98.1)	3 (1.9)	158			
College graduate or higher	347 (97.7)	8 (2.3)	355			
Income				2.619	0.454	0.035
Less than $10,000	925 (97.2)	27 (2.8)	952			
$10,000 to $29,999	467 (97.9)	10 (2.1)	477			
$30,000 to $49,999	317 (96.1)	13 (3.9)	330			
$50,000 or more	344 (96.6)	12 (3.4)	356			
Healthcare insurance coverage						
Medicare	187 (95.9)	8 (4.1)	195	1.012	0.314	0.022
Medicaid/CHIP	463 (97.5)	12 (2.5)	475	0.399	0.528	0.014
Tricare/CHAMPUS/CHAMPVA/VA/ Military	77 (98.7)	1 (1.3)	78	0.781	0.377	0.019
Private insurance	1,228 (96.3)	47 (3.7)	1,275	6.231	0.013	0.054
Private insurance through employer or union	1,090 (96.3)	42 (3.7)	1,132	0.016	0.898	0.004

Used Pain Reliever (Not Directed) Because Hooked

A chi-square test for association was performed between the independent variables (age, sex, race, education level, income level, and healthcare insurance plans) and the subset dependent variable of *Used pain reliever (not directed) because hooked* (Table 19). Age was not significant for using PO not as directed because participants were hooked, χ^2, (6, 2,115) = 4.67, p = .59, with more participants (42.5%) being classified as 35 years or older (n = 31). Sex, χ^2, (1, 2,115) = .13, p = .72, and race, χ^2, (6, 2,115) = 10.76, p = .10, were both not significant for using pain reliever not as directed due to participants being hooked on prescription pain relievers. In the subcategory of the dependent variable, few participants admitted to using PO due to be hooked. Even more, fewer participants were classified as having less than a fifth-grade education through having completed high school but not receiving a high school diploma. As a result, these classifications were collapsed to report salient findings. After collapsing the data, education level was significant, χ^2, (10, 2,115) = 17.85, p = .06, where there was an increased likelihood of a participant to misuse PO due to being hooked as education level increased through college. Notably, 38.4% of participants attended college, but did not complete a degree (n = 28). Most participants made less than $10,000 (n = 24) although income was not statistically significant, χ^2, (6, 2,115) = 5.44, p = .14. Lastly, private insurance was the only healthcare care insurance plan that was statistically significant in this subcategory, χ^2, (1, 2,106) = 7.40, p = .01, suggesting that those beneficiaries with private insurance are more likely to misuse pain relievers in a way not directed by the physician because they are hooked on PO. Medicare, χ^2, (1, 2,107) = .1.02, p = .31,

Medicaid/CHIP, χ^2, (1, 2,096) = .79, p = .37,

Tricare/CHAMPUS/CHAMPVA/VA/Military, χ^2, (1, 2,108) = 2.82, p = .09, and private plan offered through employer or union, χ^2, (1, 1,275) = .17, p = .68 were all not significant.

Table 19

Bivariate Analysis (Chi-Square) Between Independent Variables of the Study and Subcategory Used Pain Reliever (Not Directed) Because Hooked

Used Pain Reliever (not directed) because hooked						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	2,042 (96.5)	73 (3.5)	2,115			
Age Range				4.672	0.587	0.047
12-13 years old	166 (97.6)	4 (2.4)	170			
14-15 years old	139 (95.9)	6 (4.1)	145			
16-17 years old	169 (97.1)	5 (2.9)	174			
18-20 years old	189 (97.9)	4 (2.1)	193			
21-25 years old	319 (95.5)	15 (4.5)	334			
26-34 years old	311 (97.5)	8 (2.5)	319			
35 or older	749 (96.0)	31 (4.0)	780			
Sex				0.125	0.724	0.008
Male	1,022 (96.7)	35 (3.3)	1,057			
Female	1,020 (96.4)	38 (3.6)	1,058			
Race/Ethnicity				10.759	0.096	0.071
Non-Hispanic White	1,168 (96.8)	39 (3.2)	1,207			
Non-Hispanic Black/African American	275 (97.5)	7 (2.5)	282			
Non-Hispanic Native American/Alaskan Native	27 (90.0)	3 (10.0)	30			
Non-Hispanic Native Hawaiian/Other Pacific Islander	8 (88.9)	1 (11.1)	9			
Non-Hispanic Asian	94 (98,9)	1 (1.1)	95			
Non-Hispanic more than one race	79 (97.5)	2 (2.5)	81			

Used Pain Reliever (not directed) because hooked						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	2,042 (96.5)	73 (3.5)	2,115			
Hispanic	391 95.1)	20 (4.9)	411			
Education				16.075	0.003	0.87
<5th grade through HS, No Diploma	509 (97.9)	11 (2.1)	520			
High school diploma/GED	500 (95.1)	26 (4.9)	526			
Some college credit, but no degree	528 (95.0)	28 (5.0)	556			
Associates degree	155 (98.1)	3 (1.9)	158			
College graduate or higher	350 (98.6)	5 (1.4)	355			
Income				5.442	0.142	0.051
Less than $10,000	928 (97.5)	24 (2.5)	952			
$10,000 to $29,999	454 (95.2)	23 (4.8)	477			
$30,000 to $49,999	318 (96.4)	12 (3.6)	330			
$50,000 or more	342 (96.1)	14 (3.9)	356			
Healthcare insurance coverage						
Medicare	186 (95.4)	9 (4.6)	195	1.024	0.312	0.022
Medicaid/CHIP	462 (97.3)	13 (2.7)	475	0.794	0.373	0.019
Tricare/CHAMPUS/CHAMPVA/VA/ Military	78 (100.0)	0 (0.0)	78	2.823	0.093	0.037
Private insurance	1,221 (95.8)	54 (4.2)	1,275	7.404	0.007	0.059
Private insurance through employer or union	1,085 (95.8)	47 (4.2)	1,132	0.173	0.678	0.012

Used Pain Reliever (Not Directed) Other Reason

A chi-square test for association was performed between the independent variables (age, sex, race, education level, income level, and healthcare insurance plans) and the subset dependent variable of *Used pain reliever (not directed) other reason* (Table 20). Age was not significant for using pain relievers not as directed for other unspecified reasons, χ^2, (6, 2,115) = 5.27, p = .51. Likewise, sex, χ^2, (1, 2,115) = .30, p = .59, and race, χ^2, (6, 2,115) = 4.27, p = .64, were also not significant for using prescription pain reliever not as directed for other reason. Notably, males (52.8%) outnumbered females (47.2%) and Non-Hispanic Whites (61.8%) were the primary racial classification in this subcategory (n = 55). Education, however, was significant, χ^2, (7, 2,115) = 10.943, p = .14, but was negatively correlated. This negative correlation is indicative of the unlikelihood of an individual to use prescription pain relievers not directed by a physician in an unspecified way for another reason as education level increases. Most participants (46.1%) were categorized as having a high school diploma/GED (n = 22) and some college credit, but no degree (n = 19). Income level was not significant for using pain relievers not as directed in an unspecified manner, χ^2, (3, 2,115) = 2.96, p = .40, with the majority having less than $10,000 (n = 46). Relative to healthcare insurance plans, Medicare, χ^2, (1, 2,107) = .21, p = .64, Medicaid/CHIP, χ^2, (1, 2,096) = 2.55, p = .11, Tricare/CHAMPUS/CHAMPVA/VA/Military, χ^2, (1, 2,108) = 1.73, p = .19, private plan χ^2, (1, 2,106) = 3.24, p = .07, and private plan offered through employer or union, χ^2, (1, 1,275) = .19, p = .67, were all not significant.

Table 20

Bivariate Analysis (Chi-Square) Between Independent Variables of the Study and Subcategory Used Pain Reliever (Not Directed) Other Reason

Independent Variables	Used Pain Reliever (not directed) other reason					
	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	2,026 (95.8)	89 (4.2)	2,115			
Age Range				5.265	0.510	0.050
12-13 years old	161 (94.7)	9 (5.3)	170			
14-15 years old	140 (96.6)	5 (3.4)	145			
16-17 years old	165 (94.8)	9 (5.2)	174			
18-20 years old	182 (94.3)	11 (5.7)	193			
21-25 years old	316 (94.6)	18 (5.4)	334			
26-34 years old	308 (96.6)	11 (3.4)	319			
35 or older	754 (96.7)	26 (3.3)	780			
Sex				0.298	0.585	0.012
Male	1,010 (95.6)	47 (4.4)	1,057			
Female	1,016 (96.0)	42 (4.0)	1,058			
Race/Ethnicity				4.273	0.640	0.045
Non-Hispanic White	1,152 (95.4)	55 (4.6)	1,207			
Non-Hispanic Black/African American	270 (95.7)	12 (4.3)	282			
Non-Hispanic Native American/Alaskan	30 (100.0)	0 (0.0)	30			
Non-Hispanic Native Hawaiian/Other Pacific Islander	8 (88.9)	1 (11.1)	9			
Non-Hispanic Asian	90 (94.7)	5 (5.3)	95			
Non-Hispanic more than one race	79 (97.5)	2 (2.5)	81			

Independent Variables	Used Pain Reliever (not directed) other reason No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	2,026 (95.8)	89 (4.2)	2,115			
Hispanic	397 (96.6)	14 (3.4)	411			
Education				10.943	0.141	0.072
<5th grade through 8th grade, completed	127 (91.4)	12 (8.6)	139			
Ninth grade completed	90 (94.7)	5 (5.3)	95			
Tenth grade completed	97 (93.3)	7 (6.7)	104			
Eleventh or twelfth grade completed, no diploma	175 (96.2)	7 (3.8)	182			
High school diploma/GED	504 (95.8)	22 (4.2)	526			
Some college credit, but no degree	537 (96.6)	19 (3.4)	556			
Associates degree	154 (97.5)	4 (2.5)	158			
College graduate or higher	342 (96.3)	13 (3.7)	355			
Income				2.964	0.397	0.037
Less than $10,000	906 (95.2)	46 (4.8)	952			
$10,000 to $29,999	459 (96.2)	18 (3.8)	477			
$30,000 to $49,999	315 (95.5)	15 (4.5)	330			
$50,000 or more	346 (97.2)	10 (2.8)	356			
Healthcare insurance coverage						
Medicare	188 (96.4)	7 (3.6)	195	0.214	0.644	0.10
Medicaid/CHIP	461 (97.1)	14 (2.9)	475	2.548	0.110	0.035
Tricare/CHAMPUS/CHAMPVA/VA/ Military	77 (98.7)	1 (1.3)	78	1.731	0.188	0.029
Private insurance	1,213 (95.1)	62 (4.9)	1,275	3.237	0.072	0.039

Used Pain Reliever (not directed) other reason						
Independent Variables	No *N* (%)	Yes *N* (%)	Total	χ^2	p	Cramer's V
Total	2,026 (95.8)	89 (4.2)	2,115			
Private insurance through employer or union	1,078 (95.2)	54 (4.8)	1,132	0.186	0.666	0.012

Chi-Square Analyses of Statistically Significant Dependent Subcategories

A chi-Square analysis of independent variables was performed with combinations between subcategories of the dependent variable, PO misuse. After a chi-square analysis reveal associations between individual subcategories of PO misuse and independent sociodemographic variables, a more critical analysis was performed. Whereas some subcategories were found to be statistically significant as standalone variables, the combination of subcategories revealed that there were relationships between sociodemographic variables and various combined subcategories. Appendices A through F highlight the totality of these significant findings.

Age

A chi-square analysis of the sociodemographic independent variable age was performed between each combined dependent subcategory of PO misuse. When crossed with a combination of participants having used PO not as directed longer than the prescription originally intended and used PO not as directed in a greater amount than the original prescription intended, age was found to be statistically significant, χ^2, (6, 56,136) = 12.65, p = 0.049, which revealed that as participants' age increased, they were least likely to use PO not as directed longer and in greater amounts than the original

prescription intended. More participants (39.8%) were classified as 35 years or older (n = 209). The second highest category was 21-25 years old (13.7%). See Appendix A.

Sex

A chi-square analysis of was performed between sex and several combined subcategories of PO misuse. See Appendix B. When crossed with a combination of participants having used PO not as directed and longer than the original prescription intended combined with using PO not as directed in greater amounts than the original prescription was written, sex was significant, χ^2, (1, 5,229) = 4.66, p = 0.03, where females (54.1%) were more likely than males (45.9%) to use pain relievers not as directed longer and in greater amounts than the original prescription required. Compared to using prescription pain relievers longer and more often than the prescription intended, sex was significant, χ^2, (1, 5,229) = 7.104, p = 0.008, where females (55.9%), again, were more likely to use PO longer and more often than males (44.1%) than the original prescription required. The chi-square analysis between sex and using pain relievers longer and in ways not directed to relieve pain, was significant, χ^2, (1, 5,229) = 10.12, p = .001, for females (53.2%) who were more likely to use PO not directed longer and in other ways to relieve pain than as the physician directed opposed to males (46.8%).

A chi-square analysis of PO used for other unidentified reasons combined with using OxyContin not as directed by physician and sex was statistically significant, χ^2, (1, 5,229) = 4.87, p = .03, for males (56.5%) to use PO not as directed for other reason and using OxyContin not as directed by the physician than females (43.5%). Similarly, using PO for other unidentified reasons not directed and using PO in other ways to relieve pain

was significant, χ^2, (1, 5,229) = 6.62, p = 0.01, for females (52.4%) to use PO in unspecified ways not directed and to relieve pain in ways not directed by the physician rather than males (47.6%). Lastly, the association between sex and using pain relievers not directed for other reasons and using PO not directed to get high was significant, χ^2, (1, 5,229) = 8.96, p = 0.003, for males (56.5%), who were more likely to misuse PO to get high or for other unspecified reason than females (43.5%).

Education Level

Education level was analyzed using chi-square analysis in the same fashion as the other independent variables combined with various subcategories of types of PO misuse. However, and due to some categories within education having low number, which would not present salient findings, some education categories were collapsed and thus, is listed as less than fifth grade through eighth grade completed. Appendix C encompasses a complete list of results from the chi-square analysis between education level and various types of misuse combined. In this case, 23 of the possible combined misuse types were found to have significant associations with education.

A chi-square analysis between education and PO use not directed longer than the prescription intended combined with using OxyContin not directed by the physician was statistically significant, χ^2, (7, 5,229) = 26.44, p <.001, for a decreased likelihood of misusing PO by taking longer than directed or misusing OxyContin by taking it not as directed by physician as education level increases. Most participants (30.9%) were categorized as having some college credit, but no degree (n = 99). Similarly, an analysis between education and pain relievers used not as directed longer than the prescription

intended combined with using PO not as directed in greater amounts than originally intended was significant, χ^2, (7, 5,229) = 20.93, p = 0.004. Participants who were received higher levels of education were least likely to misuse PO by taking them not directed longer than intended and in greater amounts. More participants (31.2%) were classified as having some college credit, but not degree.

A crosstabulation between education and using pain relievers not directed longer than intended combined with using PO not directed to relieve pain was statistically significant, χ^2, (10, 5,229) = 46.20, p <.001, for decreased likelihood of using PO longer or to relieve pain in ways not directed by the physician as education level increases. Likewise, prescription pain relievers used not as directed longer than anticipated and used not as directed to relax, was statistically significant, χ^2, (10, 5,229) = 127.78, p <.001. As education level increased, the likelihood of using PO not as directed longer than the prescription intended and to relax decreased. A chi-square analysis between education and using PO not directed longer and using pain relievers not as directed to experiment was statistically significant, χ^2, (10, 5,229) = 137.78, p <.001, in decreasing the likelihood in engaging in these types of opioid misuse as education level increased.

Education level was statistically significant in the same manner when analyzed with using PO not as directed longer than intended combined with using pain relievers because high [χ^2, (10, 5,229) = 137.78, p <.001], misusing PO by taking them longer than intended combined with using them for sleep not directed by physician [χ^2, (10, 5,229) = 137.78, p = <.001], using PO not directed longer and for emotions not directed by physician [χ^2, (10, 5,229) = 137.78, p = <.001], misusing PO longer combined with for

other drug effects [χ^2, (10, 5,229) = 137.78, p = <.001], and using PO not directed longer than intended combined with because of being hooked on the medication [χ^2, (10, 5,229) = 137.78, p = <.001]. All of these types of combined PO misuse were significant for decreased likelihood of use as education level increased. Education when compared to PO use not as directed for other reason combined with using OxyContin not as directed by physician was statistically significant, χ^2, (7, 5,229) = 30.53, p <.001, for decreased likelihood of misusing PO for other reasons and using OxyContin not as directed by physician. When a crosstabulation was performed with pain relievers used for other reason combined with pain relievers used without own prescription, education was significant, χ^2, (10, 5,229) = 102.108, p <.001, which indicates that as education level increases, the likelihood of misusing PO for other reasons or using them without a personal prescription decreased. Related to the chi-square analyses for education and combined types of misuse, education was significant for associations made between using PO not as directed for other reason and the following statistically significant combinations in conjunction with used for other reason: using PO not as directed in greater amounts, χ^2, (10, 5,229) = 40.78, p <.001; using PO not as directed more often than authorized by physician, χ^2, (7, 5,229) = 31.77, p <.001; using PO not as directed in other ways than originally authorized and indicated, χ^2, (10, 5,220) = 38.21, p < .001; using PO not as directed to relieve pain, χ^2, (10, 5,229) = 74.80, p < .001; using PO not as directed to relax χ^2, (10, 5,229) = 32.37, p <.001; using PO not as directed to experiment, χ^2, (7, 5,229) = 63.72, p <.001; using PO not as directed because participants were high

or wanted to get high, χ^2, (7, 5,229) = 84.65, p <.001; using PO not as directed for sleep, χ^2, (10, 5,229) = 33.30, p <.001, Using PO not as directed for emotions, χ^2, (7, 5,229) = 44.93, p <.001; using PO not as directed for other drug effect, χ^2, (7, 5,229) = 30.33, p <.001; and, using PO not as directed because of the respondent being hooked on prescription pain relievers, χ^2, (7, 5,229) = 25.60, p <.001. All of these statistical results indicated that as education level increased, there was a significant likelihood that the specific types of PO misuse combinations would decrease.

Income Level

A chi-square analysis was performed between income level and several combined subcategories of PO misuse. See Appendix D for a complete analysis of statistical findings. A crosstabulation between PO using not as directed longer and using OxyContin not as directed by physician, income as statistically significant, χ^2, (3, 56,136) = 13.08, p = .004, for increased likelihood of those participants earning between $30,000 and $49,999 (0.7%) to use pain relievers not as directed longer than originally intended and misusing OxyContin not as directed by physician. A crosstabulation between using PO not directed longer than intended and not as directed to relieve pain was statistically significant, χ^2, (3, 56136) = 9.50, p = 0.02, for participants earning between $30,000 and $49,999 (2.9%). PO misuse for other unspecified reason and using OxyContin not directed by the physician was statistically significant, χ^2, (3, 56,136) = 10.45, p = 0.02, for participants earning between $30,000 and $49,999 (0.7%). Using PO not directed by the physician for other reasons and to relieve pain was statistically significant, χ^2, (3, 56,136) = 8.82, p. 0.03 for participants earning between $30,000 and $49,999. However,

when using PO for other unspecified reasons and using PO not as directed for sleep, income was statistically significant, χ^2, (3, 56,136) = 9.18, p = 0.01, for those participants earning less than $10,000.

Healthcare Insurance

Appendix E outlines chi-square analysis results of subcategories of prescription misuse associated with individual healthcare insurance plans. A crosstabulation between using PO for other unspecified reasons and using OxyContin not as directed by the physician was statistically significant, χ^2, (1, 55,937) = 5.85, p = 0.01, for Medicare beneficiaries (0.8%) than those not covered by Medicare (0.5%). This significance revealed that those patients covered by Medicare were more likely to misuse PO by using them in unspecified ways not directed by the physician as well as using OxyContin not directed by the physician. Using PO longer than originally intended and for other unspecified reason not directed by the physician was statistically significant with Medicaid patients, χ^2, (1, 55,708) = 10.42, p = 0.001, who were least likely to engage in using PO longer than intended or for other unspecified reason. In this case, those who were not covered by Medicaid (0.6%) were more likely to engage in such behavior. Similarly, using pain relievers in for other reasons not directed by the physician and for other drug effects was statistically significant, χ^2, (1, 55,708) = 4.126, p = 0.042, as those who were not covered by Medicaid (0.3%) were more likely to using PO for other reasons not directed by physician and for other drug effects than those who were covered by Medicaid (0.2%).

A chi-square analysis between patients covered under Tricare, CHAMPUS, CHAMPVA, VA, or any other miliary (referred to as "Tricare, etc.", from here on) insurance and using PO for another unspecified reason or because they were hooked on the medications were statistically significant, χ^2, (1, 56,003) = 4.18, p = 0.041, such that those covered under Tricare, etc. (0.3%) were least likely to engage in using PO for unspecified reasons not directed by the physician or because they were hooked on the medication than those who were covered (n = 1). A crosstabulation between private healthcare insurance plans and using PO for other unspecified reasons combined with using pain relievers for other drug effects was statistically significant, however, χ^2, (1, 55,784) = 8.501, p = 0.004, with an increased likelihood for using PO not as directed for other reasons and for other drug effects if covered by private healthcare plans (0.3%) rather than those who were not covered by a private plan (0.2%). Similarly, those patients covered under a private healthcare insurance plan was statistically significant, χ^2, (1, 55,784) = 7.87, p = 0.005, when a crosstabulation was performed with using pain relievers not as directed for other reasons and using pain relievers not as directed because of being hooked on the medication, combined. Results of this analysis revealed that patients covered under a private healthcare insurance plan were more likely to misuse PO by using pain relievers for other reasons or because of being hooked.

Crosstabs of Combined Dependent Categories and Combined Healthcare Insurance

A chi-square analysis of combined healthcare insurance plans was performed with combinations of subcategories for the dependent variable, PO misuse. After a chi-square analysis reveal associations between combined subcategories of PO misuse and various

sociodemographic variables, a more critical analysis of types of healthcare insurance was performed was performed. The combination of combined PO misuse and combined types of healthcare insurance plans revealed that there were statistically significant associations between the two variable types as well. Appendix F outlines the results of the chi-square analysis.

A crosstabulation between taking PO not as directed longer than the prescription intended combined with taking PO for other unspecified reason and those participants having Medicaid and a private healthcare insurance plan was statistically significant for the combined misuse types, χ^2, (1, 56,136) = 4.12, p = 0.042. Those participants who used PO not as directed longer than intended by the prescription and for other unspecified reasons were more likely to have Medicaid and a private healthcare insurance plan (64%) than those who did not have Medicaid and a private healthcare insurance plan (58.4%). Similarly, other reasons combined with other drug effect and Medicaid combined with private healthcare insurance was statistically significant, χ^2, (1, 56,136) = 9.26, p = 0.002. Participants who misused PO for other unspecified reasons combined with other drug effects were more likely to have Medicaid and a private healthcare insurance plan (70.7%) than those who did not have these two types of healthcare insurance (58.4%). Results of a crosstabulation between PO use not as directed for other reasons and PO use not as directed for other drug effect was statistically significant, χ^2, (1, 56,136) = 6.08, p = 0.014, when analyzed with private healthcare insurance and private healthcare insurance through employer or union. Again, those participants who used PO not as directed for other reason combined with PO use not as directed for other drug effect were

more likely to have private insurance and private insurance through employer or union (64%) than those who did not have these types of healthcare insurance (54%). Lastly, those participants who used PO not as directed by the physician for other reasons combined with using PO because they were hooked on the medication when analyzed with Medicaid and private healthcare insurance plan was statistically significant χ^2, (1, 56,136) = 5.91, p = 0.012. As with the other combinations, those participants who engaged in these specific types of PO misuse were more likely to have Medicaid and private healthcare insurance (67.9%) than those who did not engage in this behavior (58.4%).

Binary Logistic Regression Analyses

This data was analyzed using direct binary logistic regression to assess the impact of age, sex, race, education level, income level, and types of healthcare insurance on the likelihood of participants to engage in any type—specific or nonspecific—of PO misuse. I analyzed this data using the SPSS version 28.0 software. The dependent variable was dichotomous in nature. Chi-square analyses suggested that all independent variables were significant for PO misuse, either collectively, as an individual, or in combination with another subcategory of PO misuse.

Of the six independent variables, all six variables were statistically significant either collectively, independent of another subcategory of PO misuse, or in conjunction with one or more subcategories. Appendix G details logistic regression results of all statistically significant findings of PO misuse types and the subcategories thereof.

Logistic regression was first used to analyze the relationship between age, sex, race, education level, income level, types of healthcare insurance, and combined types of PO misuse. The strongest predictor variable of combined PO misuse was all education levels excluding eighth grade completed and college graduate or higher. As education levels increased, the odds of combined PO misuse decreased with the most notable odds ratio of 67.7% (95% CI [.490, .934]) for Associates Degree holders. The second highest odd was found for those participants holding a high school diploma or GED at 63.2% (95% CI [.495, .807]).

Logistic regression was then used to analyze the relationship between age, sex, race, education level, income level, types of healthcare insurance and individualized subcategories of PO misuse. Again, details of each individual subcategory of PO misuse are found in Appendix G. Holding all predictor variables constant, education was the only predictor variable found to be statistically significant for the subcategory *Used OxyContin not directed by Dr. past 12 months*, which indicated that ninth grade completed ($p = .005$), high school diploma/GED ($p = .012$), and some college credit, but no degree ($p = .028$) were statistically significant education levels. It was found that the odds of misusing Oxycontin in a way other than how directed by the physician increased nearly seven times (OR: 6.923, 95% CI [1.821, 26.318]) for ninth graders, 1.913 times (95% CI [1.151, 3.179]) for high school diploma or GED holders, and 1.749 times (95% CI [.1.061, .2.885]) for participants with some college credit, but no degree. Based on the data analysis, no other education level was significant in contribution to those participants who used OxyContin not directed by physicians.

Logistic regression analysis was used to analyze the relationship between all independent variables and the subcategory *Used pain reliever without own Rx past 12 months*, and found that of the six independent variables, race, education, and age were statistically significant. Non-Hispanic Whites were 66.9% (95% CI [.520, .861]), non-Hispanic Asians were 48.7% (95% CI [.305, .779]), and non-Hispanic multiracial groups were 39.8% (95% CI [.243, .651]) less likely to use pain relievers without having a prescription of their own and for their personal use. Those participants who had a high school diploma or GED were 1.484 times (95% CI [1.118, 1.970]) more likely and those who had some college credit, but no college degree were 1.377 more likely (95% CI [1.043, 1.818]) to use PO without having a prescription intended for them. Similarly, the age range of 26-34 years old indicated that the odds are 1.354 times (95% CI [1.017, 1.802]) greater for participants to use PO without having a personal prescription.

The logistic regression analysis was used to analyze the relationship between all independent variables and the subcategory *Used pain relievers in greater amounts than Rx past 12 months*, holding all predictor variables constant, education and types of healthcare insurance were found to be the only statistically significant independent variable. High school diploma/GED ($p = .046$), some college credit, but no degree ($p = .001$), and Associates Degree ($p = .033$) were the only significant education levels. In fact, the two education levels with the highest odds were some college credit, but no degree which indicated that participants with this education level were 2.347 (95% CI [1.404, 3.922]) times more likely to use PO in greater amounts than the prescription intended and those participants with an Associate's degree were 2.057 (95% CI [1.059,

3.995]) times more likely to use prescription pain relievers in greater amounts than the prescription originally intended. Similarly, those participants with a private healthcare insurance plan through their employer or a union were 2.061 (95% CI [1.267, 3.354]) times more likely to use pain relievers in greater amounts than the original prescription intended.

The subcategory *Used pain reliever more often than Rx past 12 months* was analyzed using logistic regression against all independent variables. The only statistically significant independent variable was education for this subcategory of PO misuse. Ninth grade completed was the only statistically significant education level ($p = .033$). It was found that, the odds of using pain relievers more often than allotted by the prescription increased about two and one-half times (OR: 2.563, 95% CI [1.078, 6.094]) for those participants that only completed ninth grade.

Direct logistic regression was performed to assess the impact of the previously mentioned predictor variables on the odds that respondents would report that they used pain relievers longer than the prescription originally intended. Of the predictor variables, sex and education were the only significant variables. In fact, males were about 60% (OR: .599, 95% CI [.419, .855]) less likely to use PO longer than originally intended by the prescription. Additionally, those participants who completed eleventh or twelfth grade, but did not graduate from high school were 32.8% less likely (95% CI [.145, .744]) to use pain relievers longer than originally intended, and high school graduates or GED holders were about 50% (OR: .504, 95% CI [.295, .864]) less likely to engage in the same behavior.

Analyses between independent variables and the subcategory *Used last pain reliever (not directed) to relieve pain* revealed that non-Hispanic Whites and non-Hispanic Blacks were 1.654 (95% CI [1.160, 2.357]) and 1.735 (95% CI [1.032, 2.918]) times more likely to use pain relievers not as directed to relieve pain, respectively. Sex was statistically significant for males who were 53.8% (95% CI [.418, .691]) less likely to use prescriptions not as directed to relieve pain. Likewise, those who completed ninth grade education were 35.9% (95% CI [.191, .674]) less likely to use pain relievers not as directed to relieve pain. Non-Hispanic Whites were 65.5% (95% CI [.454, .946]) less likely to use PO in other ways than directed to relax as was participants who completed seventh grade, who were about 29% (OR: .289, 95% CI [.083, .1.003]) less likely to use prescription pain relievers not directed to relax. However, respondents aged 14-15 years were 2.041 (95% CI [1.048, 3.977]) times more likely to use PO not as directed to relax.

Binary logistic regression analysis was performed to assess the impact of all independent variables and the subcategory *Used last pain reliever (not directed) to experiment*. Education and age were found to be statistically significant where participants who completed ninth grade were 3.508 (95% CI [1.413, 8.707]) times more likely to use PO not as directed to experiment. Similarly, 14-15 years old were 3.298 (95% CI [1.081, 10.063]) times more likely and 16-17 years old were 3.671 (95% CI [1.219, 11.057]) times more likely to use PO not as directed to experiment. Related to using prescription pain relievers not as directed to get high, Non-Hispanic Whites were 64% less likely to use PO (95% CI [.434, .944]) and Non-Hispanic Blacks were 48.5% (95% CI [.266, .883]) less likely to use PO to get high. However, those respondents who

completed ninth grade were 2.794 (95% CI [1.409, 5.541]) times more likely to misuse PO to get high as well as those who had some college credit, but no degree who were also 1.666 (95% CI [1.055, 2.632]) times more likely to misuse PO to get high.

Analyses of independent variables and the subcategory *Used last pain reliever (not directed) for sleep* were significant for race, income, and age. Controlling for all other predictor variables, Non-Hispanic Hawaiian natives and other Pacific Islanders were found to be 26.455 (95% CI [2.484, 281.708]) times more likely to misuse PO for sleep. Similarly, participants earning $10,000 to $29,999 and $30,000 to $49,999 were 2.006 (95% CI [1.203, 3.345]) and 1.723 (95% CI [1.052, 2.822]) times more likely, respectively, to use pain relievers not as directed for sleep. However, those participants who were 21-25 years old were 47.9% (95% CI [.280, .821]) less likely and 26-34 years old were 58.7% (95% CI [.351, .984]) less likely to use prescription pain relievers not as directed for sleep. Similar analyses of independent variables and the subcategory *Used last pain reliever (not directed) because hooked* revealed two statistically significant variables: race and education level. Non-Hispanic Native Hawaiians and Alaskan natives were 13.182 (95% CI [1.508, 115.247]) times more likely to use PO not as directed because of being hooked. Participants who received a high school diploma or GED were 5.537 times (95% CI [1.596, 19.215]) more likely to misuse PO because of being hooked, as well as, participants who had some college credit, but no degree who were 4.408 (95% CI [1.267, 15.340]). PO which were used not as directed for other unspecified reason was analyzed with independent variables where income was the only statistically significant

predictor variable. Those respondents earning less than $10,000 were three times more likely to misuse PO for other reason (OD: 3.006, 95% CI [1.137, .7.948]).

After completing preliminary binary logistic regression analyses on individual subcategories of types of PO misuse, subcategories were combined, and a subsequent set of binary logistic analyses were run. This is the same procedure used when performing chi-square tests of independence. A binary logistic regression was performed to assess the impact of age, sex, race, education level, income level, and types of healthcare insurance on the odds that respondents would report that they used POPO longer than originally intended by the physician combined with using OxyContin in other ways not as directed by physician. Education was found to be statistically significant for using opioid prescriptions longer than directed and using OxyContin in other ways than directed. Ninth grade completed, eleventh or twelfth grade completed but no diploma, those with a high school diploma or GED, and those with some college credit but have no degree were all about two times more likely to use PO in this manner (ninth grade, OR: 2.730, 95% CI [1.241, 6.007]; eleventh or twelfth grade completed, OR: 1.947, 95% CI [1.021, 3.712]; High school diploma/GED, OR: 1.897, 95% CI [1.195, 3.010]; some college credit but no degree, OR: 2.188, 95% CI [1.401, 3.417]).

Logistic regression analysis was performed on independent variables and the combined subcategories *Used pain relievers (not as directed) longer than Rx* and *Used pain relievers in greater amounts than Rx past 12 months*. Sex, education, and healthcare insurance was found to be statistically significant. Males were 73.2% (95% CI [.577, .930]) less likely to use prescription pain relievers longer or in greater amounts. In

addition, participants who completed tenth grade, (OR: 1.855, 95% CI [1.003, 3.433]), eleventh or twelfth grade, but did not obtain a high school diploma (OR: 1.769, 95% CI [1.050, 2980]), or had some college credit, but no degree (OR: 1.885, 95% CI [1.327, 2.678]) were nearly twice as likely to use PO longer than the prescription intended or in greater amounts. Those participants who had Medicare were 1.79 times more likely and those who had private healthcare insurance through an employer or union were 1.68 times more likely (95% CI [1.025, 3.141] and [1.148, 2463], respectively) to PO not directed by physician in longer or in greater amounts than the prescription originally intended.

The logistic regression analysis between the independent variables and combined subcategories of the dependent variable *Used pain relievers (not directed) longer than Rx* and *Used pain reliever (not directed) more often than Rx past 12 months*, showed a statistically significant relationship for sex and education. Males were 69.3% less likely to use PO longer and more often (95% CI [.530, .904]) than the prescription intended. Additionally, those participants who completed ninth grade were more than 2 and one-half times more likely (OR: 2.649, 95% CI [1.358, 5.167]) to use PO longer than the prescription intended and more often than the prescription intended. Similarly, the logistic regression analyses with combined subcategories *Used prescription pain reliever (not directed) longer than Rx past 12 months* and *Used prescription pain reliever (not directed) in other ways than directed past 12 months,* was significant for education. Participants who completed tenth grade (OR: 1.710, 95% CI [1.006, 2.909]) or who

completed eleventh or twelfth grade, but did not receive a diploma (OR: 1.604, 95% CI [1.020, .2.524]) were more likely to engage in these specific PO misuse types.

Logistic regression analyses for all independent variables and the combined subcategories *Used prescription pain reliever (not directed) longer than Rx past 12 months* and *Used pain reliever not as directed to relieve pain* indicated statistical significance for predictor variables sex and education. Sex was a predictor variable for males. In this case, males were 74.6% less likely (95% CI [.636, .876]) to use prescription pain relievers longer than the prescription required when combined with using PO not as directed to relieve pain. Remarkably, education was statistically significant for those participants who completed sixth grade through an associate's degree, excluding eighth and ninth grades. As education level increased, the severity of the likelihood that participants used PO longer than intended and in other ways than directed to relieve pain decreased although all levels positively indicated that participants who completed these education levels were more likely to use misuse PO in this manner. Those participants who completed sixth grade were nearly 4 times as likely to misuse PO in this manner (OR: 3.976, 95% CI [2.026, 7.802]). Participants who completed an Associate's degree were 1.146 times more likely to engage in these types of misuse behavior (95% CI [1.146, 2.172]). A complete list of the salient findings in this category are found in Appendix G.

Logistic regression analyses were performed for age, sex, race, education level, income level and several combinations of the dependent variable. Uniquely, seven combinations of the subcategories were significant for education only. *Used pain reliever*

(not directed) longer than Rx past 12 years were combined with the following other subcategories: *Used pain reliever (not directed) to relax, Used pain reliever (not directed) to experiment, Used pain reliever (not directed) to get high, Used pain reliever (not directed) for sleep, Used pain reliever (not directed) for emotions, Used pain reliever (not directed) for other drug effect,* and *Used pain reliever (not directed) because hooked.* All combined subcategories were significant for fifth grade or less completed through an Associate's degree. Fifth grade or less, sixth, ninth, tenth, and eleventh or twelfth were all greater than three times more likely to engage in all seven combined subcategories of misuse (OR: 3.080, 95% CI [1.098, 8.637]; OR:3.671, 95% CI [1.872, 7.198]; OR: 3.634, 95% CI [2.311, 5.715]; OR: 3.013, 95% [2.027, 4.480]; OR: 3.671 95% CI [2.639, 5.105], respectively).

Healthcare insurance was the only statistically significant predictor of participants who used PO longer than directed combined with using it for other reason. It was found that those respondents who had Medicare were 2.226 times more likely to misuse PO by taking them longer and for other reasons not specified than any other healthcare insurance or any other predictor variable (95% CI [1.029, 4.989]). The logistic regression analysis that was performed for the independent variables and combined subcategories of *Used pain reliever (not directed) for other reason* and *Used OxyContin not as directed by Dr.* found education to be statistically significant for ninth grade, eleventh or twelfth grade no diploma, high school diploma or GED obtained, and some college credit, but no degree. Participants who were completed any of these levels were found to be greater than two times more likely to engage in these combined behaviors. Those participants

who completed a ninth-grade education were more than three times more likely to engage in this behavior (OR: 3.337, 95% CI [1.492, 7.461]). The logistic regression analysis performed for independent variables and the combined subcategories *Used pain reliever (not directed) for other reason* and *Used pain reliever (not directed) without own Rx* was statistically significant for sixth, seventh, eighth, ninth, tenth, eleventh or twelfth grades completed, no diploma, high school diploma or GED completed and some college credit, no degree. Respondents whose education level was eleventh, ninth, or eleventh or twelfth grade completed, no diploma, were more than three times as likely to use PO not as directed for other reason and without an individual prescription of their own (OR: 3.040, 95% CI [1.221, 5.152]; OR: 3.457, 95% CI [2.153, 5.552]; OR: 3.153, 95% CI [2.213, 4.491], respectively).

Binary logistic regression was performed for independent the variables and the combined subcategories *Used pain reliever (not directed) for other reason* and *Used pain reliever (not directed) in greater amount* where education and healthcare insurance were found to be statistically significant. Fifth grade or less, ninth, tenth, eleventh or twelfth grades completed, a high school diploma or GED, some college credit, no degree, and Associates' degrees were salient. As education level increased the severity of odds decreased, but these education levels were found to predict participant's use of PO not as directed for other reason and in greater amounts. Fifth grade completed or less were found to have the highest odds of predicting these misuse subcategories where participants who completed fifth grade or less were slightly five and one-half times more likely to engage in these behaviors (OD: 5.697, 95% CI [1.507, 21.533]). Of the several

types of healthcare insurance plans, Medicare recipients were 1.911 times (95% CI [1.023, 3.571]) more likely and those participants who had private insurance through an employer or union were 1.699 times (95% CI [1.130, 2.553]) more likely to engage in these types of combined opioid misuse than any other healthcare insurance plan users.

Logistic regression was used to analyze the relationship between age, sex, race, education level, income level, types of healthcare insurance and the dependent combined subcategories *Used pain reliever (not directed) for other reason* and *Used pain reliever (not directed) more often.* For this set of combined subcategories, education was statistically significant for seventh grade through an Associate's degree, excluding eighth grade completed. In this case, those participants who completed ninth grade were greater than five times (OD: 5.067, 95% CI [2.523, 10.178]) more likely to engage in using PO for other reasons and using them more often. Similarly, the logistic regression for combined subcategories *Used pain reliever (not directed) for other reason* and *Used pain reliever (not directed) in other ways* was statistically significant for education as well. In these combined subcategories, those participants who completed tenth grade had the highest odds ratio and were 2.602 times (95% CI [1.483, 4.568]) more likely to engage in these behaviors of PO misuse. As with other combined subcategories, as education level increased, the severity of odds decreased.

Males were 78.8% (95% CI [.673, .922]) less likely to use pain relievers for other reasons combined with using pain relievers not directed to relieve pain than females. Those participants who completed fifth grade or less were nearly five times more likely to use pain relievers for other reason combined with using pain reliever not directed to

relieve pain (OR: 4.873, 95% CI [1.724, 13.774]). Logistic regression analysis was performed with the combined subcategories of *Used pain reliever (not directed) for other reason* and *Used pain reliever (not directed) to relax.* As education level increased, the odds of misusing PO in these combined manners decreased. Again, those participants who completed ninth grade were 2.884 times (95% CI [1.580, 5.263]) more likely to engage in this behavior. In these combined subcategories, education levels were all likely to engage in this behavior. When performed for independent variables and combined subcategories *Used pain reliever (not directed) for other reason* and *Used pain reliever (not directed) to experiment*, logistic analysis revealed that participants who completed ninth grade (OR: 6.204, 95% CI [3.053, 12.609]) or who completed eleventh or twelfth grade but did not obtain a diploma (OR: 2.506, 95% CI [1.252, 5.014]) were more likely use PO for other reasons or to experiment. By contrast, logistic regression analysis of independent variables and the combined subcategories *Used pain reliever (not directed) for other reason* and *Used pain reliever to get high* revealed that males were 1.421 times more likely to engage in this behavior (95% CI [1.123, 1.799]). In this combination, education level was statistically significant demonstrated a likelihood that participants who completed ninth grade through some college credit would engage in these behaviors. Participants who completed ninth grade were more than six times as likely, greater than any other education level (OR: 6.013, 95% CI [3.389, 10.666]). When combined subcategories *Used pain reliever (not directed) for other reason* and *Used pain reliever (not directed) to sleep*, Non-Hispanic Hawaiian or other Pacific Islanders were 5.659 (95% CI [1.372, 23.351]) times more likely than any other race to misuse PO in these

manners. Participants who completed fifth grade or less were almost four times as likely to engage in this behavior (OR: 3.988, 95% CI [1.072, 14.831]), and respondents who earned less than $10,000 were 1.729 times more likely (95% CI [1.048, 2.851]) to engage in this behavior. However, 21-25 years old participants were 57% less likely to participate in this type of opioid misuse behavior (95% CI [.365, .889]).

Logistic regression analyses were performed to assess the impact of age, sex, race, education level, income level, and healthcare insurance on the odds that respondents would report having used PO in ways not directed by the physician. The last three assessments were performed in combination with using PO not directed for other reasons. These three combinations were using pain relievers not directed for emotions, for other drug effect, and because of being hooked. Using pain relievers for other reasons combined with being hooked was statistically significant for education where participants who completed ninth grade through receiving a high school diploma or GED were more likely to engage in misusing PO for emotions or other unspecified reasons. Those who completed tenth grade were more likely, than any other education level, to engage in these specific types of misuse behavior (OD: 3.634, 95% CI [1.938, 6.816]). Combinations of using PO for other reasons and for other drug effect demonstrated that participants who completed ninth grade and eleventh or twelfth grade with no diploma were 5.303 times more likely and 3.505 times more likely to use PO in this way, respectively (95% CI [2.236, 12.575]; 95% CI [1.669, 7.358]). Education was the only statistically significant predictor variable for the combination of using PO not as directed for other reasons and because of being hooked where participants who completed ninth

grade were 3.776 times more likely (95% CI [1.378, 10.345]), the highest of all other significant education levels, to engage in misusing PO because of being hooked and for other reasons.

Summary

The evaluation of each of the research questions in this study yielded statistically significant and actionable findings that can positively contribute towards social change. Salient independent variables of this study were assessed and determined to contribute towards PO misuse. Further, the results of this study have provided evidence to reject the null hypotheses for both research questions and accept the alternative hypotheses with the exception of two subcategories. Two subcategories did not yield any salient findings that were contributory towards this study. Chi-square analyses revealed positive correlations with all six independent variables and either combined opioid misuse, individualized subcategories, or a combination of subcategories. The overarching theme of the associations was that as education levels increased, opioid misuse decreased, with few exceptions. Females were more likely to misuse PO medications longer, to relieve pain, for emotions or for other drug effects. Males were more likely to misuse PO to experiment or because they wanted to get high. Notwithstanding, Medicaid and private insurance demonstrated positive associations for those respondents who were hooked on PO, used them for other drug effects, for emotions or to get high to name a few. Income varied with the type of misuse.

Binary logistic regression supported claims that age, sex, race, income level, education level, and type of healthcare insurance were all predictors of PO misuse.

Although the predictor variable varied by specific type of misuse, each variable was contributory to the misuse of PO. For many of the individual use types and combinations, education was a statistically significant indicator. However, the least education the individual, the more likely they were to engage in specific types of opioid misuse. Ages 14 to 17 years old were predictors for misusing PO to relax, experiment, longer than intended and in other ways and more. In some cases, 26 to 34 years old were predictors for using PO from other individuals and during the period of having some college credit, but not degree. As a predictor, Medicare and private healthcare insurance through employers or a union were more likely to be the healthcare insurance of choice for misuse.

While this section has highlighted many of the significant contributions to PO misuse, these findings only contribute to what is currently known about PO, how they are misused and even abused. Analyses performed in this study confirm the need to evaluate the opioid crisis at the individual level, community level, and the local and federal government levels. These findings are intended to enhance the work of public health officials and regulatory agencies to mitigate the nefarious behaviors and unintentional loopholes formed by oversight. A more detailed explanation of the significances of these results, their implications, and how they are applicable towards effecting positive social change is discussed in the next section.

Section 4: Application to Professional Practice and Implications for Social Change

Introduction

The purpose of this study was to evaluate PO misuse, which precipitates opioid abuse, opioid overdose, opioid morbidity rates, and reversible opioid-related deaths. More than12 million people have succumbed to preventable opioid-related deaths due to misusing PO medication (Jalali et al., 2020). From 2002 through 2011, more than 25 million United States citizens commenced use of PO pain relievers not directed by physicians in a nonmedical way (Azadfard et al., 2022) and more than 11 million people misused these medications (Azadfard et al., 2022). Even during the COVID-19 worldwide coronavirus pandemic, current literature suggested that the opioid epidemic and opioid-related emergency room visits, hospital admissions, and opioid related-deaths sharply increased (Manchikanti et al., 2022). In fact, the CDC has indicated that opioid-related deaths increased by 31% from 2019 to 2022 (CDC, 2022). Manchikanti et al. (2022) suggested that this increase in the use of PO has contributed to the fourth wave of opioid overdose deaths. In part, the lack of access to treatment facilities during the pandemic contributed to increased mortality rates (Manchikanti et al., 2022; Sarker et al., 2022).

Currently, public health data related to the opioid epidemic do not provide substantial evidence-based practices to mitigate or reverse opioid related deaths (Blanco et al., 2020). Blanco et al. (2020) suggested guided public health practices that use an interdisciplinary approach to understand who is affected and why. The need for an interdisciplinary approach should include representatives from public health, healthcare,

the legal system, and the education system (Blanco et al., 2020). However, some of the current standards in opioid treatments are restrictive and prevent some public health reforms from mitigating some concerted efforts against the opioid epidemic (Dasgupta et al., 2018).

Interpretation of Findings

The results from the secondary data analysis performed on this existing dataset provided remarkable acumen into how the association of age, race, sex, education level, income level, and types of healthcare insurance predict PO misuse. Many of the results from this study confirm and challenge what is currently known in the literature. However, these results significantly contribute to the literature and offer clarification on specific types of opioid misuse. They further provide predictors for types of misuse that may guide public health professionals to effect positive social change.

Associations between predictor variables and generalized (combined) PO misuse did not contribute much to the current literature; however, education proved to have a significant impact on whether individuals were likely to misuse PO. The likelihood of PO misuse tended to decrease, overall, with the progression of education. This is in direct contrast with the assertion from Thombs et al. (2020). Dasgupta et al. (2018) contended that lower education levels contributed to PO misuse.

Although results from this study did not reveal highly significant associations between the variables and overall PO misuse, conspicuous findings were confirmed with specific types of PO misuse. Females were more likely than men to misuse PO by taking them longer, regardless of their combined reason. With respect to education, PO misuse

tended to decrease with increased education levels through college. Contrary to the study by Jayawardhana et al. (2018), which focused only on residents of Georgia, I found that income levels significantly contributed to PO misuse for individuals who made between $30,000 and $49,999. This is in contradiction to the low-income levels suggested by previous studies completed by Jayawardhana et al. Apropos to types of healthcare insurance, those individuals who had private healthcare insurance including those healthcare insurance plans through an employer or union were more likely to engage in some combination of PO misuse. This was the case for Medicaid recipients and a few exceptions for Medicare beneficiaries.

Regarding age, individuals aged 26 to 34 years old were 1.34 times more likely to use PO that did not belong to them; whereas 14 to 15 years old were 2 times as likely to use PO to relax and 3 times as likely to experiment. This coincides with the ninth-grade educational level, which is also likely to experiment. Those individuals who were 16 to 17 years old were 3.6 times as likely to use prescriptions opioids to experiment. Males were 1.4 times as likely to use PO to get high and for other reason. These findings are supported by previous studies (see Singh et al., 2019).

While many studies have confirmed disproportionate rates of opioid abuse or opioid death, many do not highlight race related to PO misuse. This study contributed to what is currently known about racial disparities among PO misuse. Race, however, was not as significant in contribution towards misuse. Notwithstanding, non-Hispanic Whites were 1.6 times more likely and non-Hispanic Blacks were 1.7 times more likely to misuse

PO to relieve pain. Native Hawaiian and Pacific Islanders were 26 times more likely to use PO to sleep and 13 times more likely to use PO because of being hooked.

This study agreed with previous studies from Jayawardhana et al. (2018) that confirmed increased education as a predictor of decreased PO misuse. However, this study revealed that individuals who completed a ninth-grade education were nearly 7 times more likely to take OxyContin not as directed. High school graduates or GED completers were 1.5 times more likely to take someone else's prescription pain reliever. As education level increased, there was a greater likelihood that individuals would use PO in greater amounts. However, those individuals who only completed ninth grade were 2.5 times more likely to use PO more often than the prescription intended and were 3.5 times more likely to use PO to experiment. Further, ninth-grade completers were 3 times as likely to use pain relievers to get high, which led to high school graduates being 5.5 times more likely to be hooked on pain medication. Those individuals who completed some college credit but did not obtain a degree were 2 times as likely to use PO to get high but were 4.4 times more likely to use them because they were hooked on them.

This study confirmed what was previously discussed in the literature review where Shaw (2020) established a connection between having money to afford PO either through means of yearly earnings or having adequate healthcare insurance to cover the cost and funds to cover the remaining copayment. Further, this study confirmed the association between those who do not have a robust healthcare insurance plan and meet the qualifications for Medicaid—either from being indigent or meeting the poverty threshold (Shaw, 2020). In this study, individuals who made under $50,000 were about 2

times more likely to use PO medication for sleep. Those individuals who made less than $10,000 were 3 times more likely to use PO for other reasons. Additionally, Medicare beneficiaries were 1.9 times more likely to use PO for other reasons and in a greater amount compared to any other insurance type and was 2.3 times more likely to use them longer and for other reasons combined. Similarly, insureds covered by a private plan through their employer or union were 1.6 times more likely to use PO in a greater amount combined with other unspecified reasons. The study by Sullivan et al. (2010) elucidated the role of healthcare insurance and its relationship with opioid abuse. Of those individuals who are commercially insured, 24% are likely to use PO in ways not directed by the physician or not intended by the prescription. Similarly, 20% of Medicaid patients and about 13% of the privately covered insureds fall into this classification as well (Sullivan et al., 2011).

Limitations of the Study

This study had several limitations to be considered. As with many studies, the dataset used in this study had several imputed data that could have contributed to a lower-than-normal power calculation. Because the data collection method included computer-assisted surveys, respondents may have accidentally omitted information or may not have felt comfortable submitting sensitive information despite the controlled setting and reassurance of anonymity. Second, this survey was an all-inclusive survey on various topics, which many have led to survey fatigue. Survey fatigue is a well-known phenomenon in academia where respondents become tired of the number of surveys or the length of the survey and perform suboptimally to expedite the completion of the

survey (de Koning et al., 2021) Survey fatigue may also occur when the respondent may choose to prematurely terminate the survey before its completion (de Koning et al., 2021). In this case, the specificity of the questions may have led to respondents choosing a best-fit answer rather than a comprehensive or truthful answer. Responses of this nature could reduce the reliability of the results and subsequently skew the data.

Another limitation of this study is by relying upon respondents to select the most applicable answer (of the choices given) rather than the answer that is representative of their life. For example, this study asked about healthcare insurance coverage. However, many people may have multiple types of healthcare insurance plans for several reasons (e.g., vision, dental, prescription, medical, and major medical). Notwithstanding, not all types of healthcare insurance plans are applicable to PO misuse; still, other types of healthcare insurance plans may have been omitted, subjectively, based on the respondents' interpretation of relevance. Another limitation of this study was that the existing dataset collected by NSDUH did not account for or ask subjects about multiple health insurance plans. Some citizens are afforded the opportunity to have more than one health insurance plan. Lastly, one limitation was the possibility of an interaction effect in this study due to the six independent variables. The interaction effect between these variables may possibly cause a less reliable probability.

Recommendations

Future research could include current data post-COVID-19 because there has been an ongoing increase in the number of prescriptions written for opioids and opioid derivatives. In addition, national programs should focus on PO misuse and abuse among

adolescents entering high school and college at the state and local levels. From this study, it was realized that there are differences between which healthcare insurance companies contribute towards PO misuse and those that do not. Parity among healthcare insurance companies should be reevaluated and should have federal standards and benchmarks for drug utilization review for all commercial and private insurance companies. Prada and Loaiza (2019) stated that there is a lack of methodological consistency among regulations for state-run Medicaid programs. Lastly, PO misuse surveillance programs could prove to be beneficial provided real-time tracking is available for the national level through local regions within a state. This would allow unique and targeted resources to be utilized to educate, reinforce, and provide access to care for specific regions based on needs instead of utilizing a national intervention strategy.

Implications for Professional Practice

As previously mentioned, the results of this study confirm what is known about PO and their social effects on from a community, state, and national level. The realized results from this study provide cohesive implications for professional practices and reevaluations of current healthcare and public health practices. The very specific causes of PO misuse can provide topics of physician-patient counseling, which is the same practice among any new medication or medical intervention therapy. Reinforcement of the severity of side effects, treatments, and morbidity or mortality rates provide a robust change in medical practices of when to use these medications, how much to use, and when to prescribe them. The ability for physicians to have a wide latitude in the decision-making process has been previously challenged in the United States judicial system

(Brushwood, 2007). In fact, unconventional medical practices do not rise to the level of medical malpractice (Brushwood, 2007). In June 2022, the United States Supreme Court decided a case, *Ruan v. United States*, where two physicians used opioids in an unconventional way to treat a patient's chronic pain. The majority opinion, in this case, acknowledged that physicians' *mens rea* or knowledge and intention of acting in good faith suffices for the use of unconventional practices and cannot be held liable for good faith intentions (*Ruan v. United States*, 2022). However, there is a need to educate physicians on the risk of excessive PO use by patients, patients who use PO written by multiple medical providers, and to minimize less than conscientious providers when acting in good faith.

Additionally, there is a need to provide stigma-free education to the community about the dangers of misusing PO and the sociodemographic groups who are most likely to be greatly affected by them. Moreover, education is constrained by undereducated or misinformed healthcare providers about the appropriateness of PO and the effects they may have on a certain population (Disgupta et al., 2018). Historical precedence of medical treatment provided to minorities have led to mistrust of the medical profession (Bazargan et al., 2021). Thus, evidence-based education should be provided to medical and mental healthcare providers to regain trust of the medical system among minorities, in particular. Finally, implication for professional practice is needed among healthcare insurance companies. Although most healthcare insurance companies have a drug utilization review department that regulates what medication is approved for use and under what circumstances, there appears to be a lack of consistency among companies

that varies, further, from state to state (Blake, 2019). This study confirmed that there is an increased likelihood of misusing PO based on the type of healthcare insurance an individual has. However, other healthcare insurance companies demonstrate greater compliance of PO use among their insureds. An interdisciplinary approach should be used to evaluate parity among all healthcare insurance companies on a federal level.

Positive Social Change

The SEM was selected as the most appropriate theoretical framework because it provided a comprehensive foundation for the type of public health problem addressed in this study. The opioid epidemic has proven to be boundless in terms of social determinants, social class, and social status. This study and its implications have provided a better understanding of sociodemographic factors that predict PO misuse, which is the precursor to PO abuse, overdose rates, and opioid-related deaths. Positive social change can be realized when this epidemic is destigmatized and treatment is standardized among age, sex, race, education level, income level, and type of healthcare insurance an individual may choose to select.

Findings from this study can help communities understand the impact PO misuse have on opioid abuse and further consequential outcomes. This study provides the foundation for stakeholders and policymakers to ensure equitable practices and procedures that can be used nationally as well as at the local level. By using the SEM model, scholar-practitioners better understand that the opioid epidemic is not an isolated event where any one entity is to blame, but rather, that there is an interdisciplinary opportunity for positive social change at every level. Future preventative strategies are

impactful by providing data analytics tools such as a dashboard, which can provide real-time updates and information for which regions or sociodemographic groups may need additional assistance.

Conclusion

The objective of this research study was to raise awareness and positively contribute to the current literature on the opioid epidemic and PO misuse. The results of this study suggest the critical need for continued research, equity among treatment across sociodemographic groups, and parity among healthcare insurance companies. There is a significant need to propose legislative and practical solutions to mitigate overdose rates and reversible deaths among individuals who use and misuse prescription pain relievers. Although steps have been taken to flatten the epidemiological curve for opioid abuse, individuals in dire need of opioid treatment are among those with limited access to treatment facilities and treatment programs. Future studies should provide quantitative and qualitative analyses to directly address root causes for sociodemographic groups who are more likely to use and misuse PO. There is a need to continue under the SEM to address the opioid crisis. Longitudinal solutions will only be realized once both cultural and social norms are addressed. National programs that provide physical and mental support for PO users should address misuse at the national level as well as the local community level. Finally, health education reinforcement for the healthcare professional and the end-user is critical to address the larger opioid epidemic problems.

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Appendix A: Crosstabs of Age and Significant Types of Opioid Misuse Combinations

Independent Variables	Combined Types of Opioid Misuse			χ^2	p	Cramer's V
	No	Yes	Total			
	55,611 (99.1%)	525 (0.9%)	56,136			
Age/Used longer*Greater amount[a]				12.653	0.049	0.015
12-13 years old	4,280 (98.8)	53 (1.2)	4,333			
14-15 years old	4506 (99.1)	39 (0.9)	4,545			
16-17 years old	4,475 (99.0)	44 (1.0)	4,519			
18-20 years old	5,330 (99.3)	39 (0.7)	5,369			
21-25 years old	8,785 (99.2)	72 (0.8)	8,857			
26-34 years old	8,532 (99.2)	69 (0.8)	8,601			
35 years or older	19,703 (99.0)	209 (1.0)	19,912			

Note. The statistically significant data that support the findings of this study have been reported in this table. To preserve the length and clarity of this document, only salient data are reported, but are available from the author, KG, upon reasonable request.

[a]Used longer*Greater amount is an abbreviated version of the misuse categories *Used pain reliever longer than Rx past 12 months* and *Used pain reliever in greater amounts than Rx past 12 months*.

Appendix B: Crosstabs of Sex and Significant Types of Opioid Misuse Combinations

Independent Variables	Combined Types of Opioid Misuse			χ^2	p	Cramer's V
	No	Yes	Total			
	4,704 (90.0%)	525 (10.0%)	5,229			
Sex/Used longer*Greater amount[a]				4.661	0.031	0.030
Males	2,393 (90.9)	241 (9.1)	2,634			
Females	2,311	284 (10.9)	2,595			
Sex/Used longer*Used more often[b]				7.104	0.008	0.037
Males	2,451 (93.1)	183 (6.9)	2,634			
Females	2,363	232 (8.9)	2,595			
Sex/Used longer*Relieve pain[c]				10.117	0.001	0.044
Males	1,960 (74.4)	674 (25.6)	2,634			
Females	1,829 (70.5)	766 (29.5)	2,595			
Sex/Used other reason*OxyContin used[d]				4.871	0.027	0.031
Males	2,459 (93.4)	175 (6.6)	2,634			
Females	2,460 (94.8)	135 (5.2)	2,595			
Sex/Used other reason[e] *Relieved pain[e\]				6.622	0.010	0.036
Males	1,919 (72.9)	715 (27.1)	2,634			
Females	1,807 (69.6)	788 (30.4)	2,595			
Sex/Used other reason*To get high[f]				8.955	0.003	0.041
Males	2,328 (88.4)	306 (11.6)	2,634			
Females	2,359 (90.9)	236 (9.1)	2,595			

Note. The statistically significant data that support the findings of this study have been reported in this table. To preserve the length and clarity of this document, only salient data are reported, but are available from the author, KG, upon reasonable request. [a]Used longer*Greater amount is an abbreviated version of the misuse categories *Used pain reliever longer than Rx past 12 months* and *Used pain reliever in greater amounts than Rx past 12 months*. [b]Used more often is Used pain reliever more often than Rx past 12 months. [c]Relieve pain is used last pain reliever (not directed) to relieve pain. [d]Oxycontin used is Used OxyContin not directed by Dr. past 12 months. [e]Used other reason is Used last pain reliever (not directed) for other reason. [f]To get high is Used last pain reliever (not directed) to get high.

Appendix C: Crosstabs of Education Level and Significant Types of Opioid Misuse Combinations

Independent Variables	Combined Types of Opioid Misuse			χ^2	p	Cramer's V
	No	Yes	Total			
	4,704 (99.1%)	525 (0.9%)	5,229			
Education/Used longer*OxyContin[a] used				26.438	<.001	0.071
<5th grade through 8th grade completed	257 (95.9)	11 (4.1)	268			
Ninth grade completed	114 (91.7)	13 (8.3)	157			
Tenth grade completed	186 (94.9)	10 (5.1)	196			
Eleventh or twelfth grade completed, no diploma	315 (92.9)	24 (7.1)	339			
High school diploma/GED	1,131 (92.3)	94 (7.7)	1,225			
Some college credit, but no degree	1,230 (92.6)	99 (7.4)	1,329			
Associates degree	443 (96.1)	18 (3.9)	461			
College graduate or higher	1,203 (95.9)	51 (4.1)	1,254			
Education/Used longer*Greater amount[b]				20.927	0.004	0.063
<5th grade through 8th grade completed	242 (90.3)	26 (9.7)	268			
Ninth grade completed	138 (87.9)	19 (12.1)	157			
Tenth grade completed	174 (88.8)	22 (11.2)	196			
Eleventh or twelfth grade completed, no diploma	304 (89.7)	35 (10.3)	339			
High school diploma/GED	1,102 (90.0)	123 (10.0)	1,225			
Some Cclege credit, but no degree	1,165 (87.7)	164 (12.3)	1,329			
Associates degree	414 (89.8)	47 (10.2)	461			
College graduate or higher	1,165 (92.9)	89 (7.1)	1,254			

Independent Variables	Combined Types of Opioid Misuse			χ^2	p	Cramer's V
	No	Yes	Total			
	4,704 (99.1%)	525 (0.9%)	5,229			
Education/Used longer*Relieved Pain[c]				46.199	<.001	0.094
Fifth grade or less completed	19 (67.9)	9 (32.1)	28			
Sixth grade completed	28 (51.9)	26 (48.1)	54			
Seventh grade completed	51 (67.1)	25 (32.9)	76			
Eighth grade completed	78 (70.9)	32 (29.1)	110			
Ninth grade completed	107 (68.2)	50 (31.8)	157			
Tenth grade completed	136 (69.4)	60 (30.6)	196			
Eleventh or twelfth grade completed, no diploma	233 (68.7)	106 (31.3)	339			
High school diploma/GED	867 (70.8)	358 (29.2)	1,225			
Some college credit, but no degree	944 (71.0)	385 (29.0)	1,329			
Associates degree	338 (73.3)	123 (26.7)	461			
College graduate or higher	988 (78.8)	266 (21.2)	1,254			
Education/Used longer*Used to relax[d]				127.782	<.001	0.162
Fifth grade or less completed	14 (50.0)	14 (50.0)	28			
Sixth grade completed	24 (44.4)	30 (55.6)	54			
Seventh grade completed	38 (50.0)	38 (50.0)	76			
Eighth grade completed	63 (57.3)	47 (42.7)	110			
Ninth grade completed	70 (44.6)	87 (55.4)	157			
Tenth grade completed	97 (49.5)	99 (50.5)	196			

Independent Variables	Combined Types of Opioid Misuse No 4,704 (99.1%)	Yes 525 (0.9%)	Total 5,229	χ^2	p	Cramer's V
Eleventh or twelfth grade completed, no diploma	165 (48.7)	174 (51.3)	339			
High school diploma/GED	714 (58.3)	511 (41.7)	1,225			
Some college credit, but no degree	783 (58.9)	546 (41.1)	1,329			
Associates degree	306 (66.4)	115 (33.6)	461			
College graduate or higher	903 (72.0)	351 (28.0)	1,254			
Education/Used longer*Experiment[e]				137.782	<.001	0.162
Fifth grade or less completed	14 (50.0)	14 (50.0)	28			
Sixth grade completed	24 (44.4)	30 (55.6)	54			
Seventh grade completed	38 (50.0)	38 (50.0)	76			
Eighth grade completed	63 (57.3)	47 (42.7)	110			
Ninth grade completed	70 (44.6)	87 (55.4)	157			
Tenth grade completed	97 (49.5)	99 (50.5)	196			
Eleventh or twelfth grade completed, no diploma	165 (48.7)	174 (51.3)	339			
High school diploma/GED	714 (58.3)	511 (41.7)	1,225			
Some college Ccedit, but no degree	783 (58.9)	546 (41.1)	1,329			
Associates degree	306 (66.4)	155 (33.6)	461			
College graduate or higher	903 (72.0)	351 (28.0)	1,254			
Education/Used longer*Because high[f]				137.782	<.001	0.162
Fifth grade or less completed	14 (50.0)	14 (50.0)	28			
Sixth grade completed	24 (44.4)	30 (55.6)	54			

Independent Variables	Combined Types of Opioid Misuse			χ^2	p	Cramer's V
	No	Yes	Total			
	4,704 (99.1%)	525 (0.9%)	5,229			
Seventh grade completed	38 (50.0)	38 (50.0)	76			
Eighth grade completed	63 (57.3)	47 (42.7)	110			
Ninth grade completed	70 (44.6)	87 (55.4)	157			
Tenth grade completed	97 (49.5)	99 (50.5)	196			
Eleventh or twelfth grade completed, no diploma	165 (48.7)	174 (51.3)	339			
High school diploma/GED	714 (58.3)	511 (41.7)	1,225			
Some college credit, but no degree	783 (58.9)	546 (41.1)	1,329			
Associates degree	306 (66.4)	155 (33.6)	461			
College graduate or higher	903 (72.0)	351 (28.0)	1,254			
Education/Used Longer*For sleep[g]				137.782	<.001	0.162
Fifth grade or less completed	14 (50.0)	14 (50.0)	28			
Sixth grade completed	24 (44.4)	30 (55.6)	54			
Seventh grade completed	38 (50.0)	38 (50.0)	76			
Eighth grade completed	63 (57.3)	47 (42.7)	110			
Ninth grade completed	70 (44.6)	87 (55.4)	157			
Tenth grade completed	97 (49.5)	99 (50.5)	196			
Eleventh or twelfth grade completed, no diploma	165 (48.7)	174 (51.3)	339			
High school Ddploma/GED	714 (58.3)	511 (41.7)	1,225			
Some college credit, but no degree	783 (58.9)	546 (41.1)	1,329			
Associates degree	306 (66.4)	155 (33.6)	461			

Independent Variables	Combined Types of Opioid Misuse			χ^2	p	Cramer's V
	No	Yes	Total			
	4,704 (99.1%)	525 (0.9%)	5,229			
College graduate or higher	903 (72.0)	351 (28.0)	1,254			
Education/Used longer*For emotions[h]				137.782	<.001	0.162
Fifth grade or less completed	14 (50.0)	14 (50.0)	28			
Sixth grade completed	24 (44.4)	30 (55.6)	54			
Seventh grade completed	38 (50.0)	38 (50.0)	76			
Eighth grade completed	63 (57.3)	47 (42.7)	110			
Ninth grade completed	70 (44.6)	87 (55.4)	157			
Tenth grade completed	97 (49.5)	99 (50.5)	196			
Eleventh or twelfth grade completed, no diploma	165 (48.7)	174 (51.3)	339			
High school diploma/GED	714 (58.3)	511 (41.7)	1,225			
Some college credit, but no degree	783 (58.9)	546 (41.1)	1,329			
Associates degree	306 (66.4)	155 (33.6)	461			
College graduate or higher	903 (72.0)	351 (28.0)	1,254			
Education/Used longer*Other effect[i]				137.782	<.001	0.162
Fifth grade or less completed	14 (50.0)	14 (50.0)	28			
Sixth grade completed	24 (44.4)	30 (55.6)	54			
Seventh grade completed	38 (50.0)	38 (50.0)	76			
Eighth grade completed	63 (57.3)	47 (42.7)	110			
Ninth grade completed	70 (44.6)	87 (55.4)	157			
Tenth grade completed	97 (49.5)	99 (50.5)	196			

Independent Variables	Combined Types of Opioid Misuse No 4,704 (99.1%)	Yes 525 (0.9%)	Total 5,229	χ^2	p	Cramer's V
Eleventh or twelfth grade completed, no diploma	165 (48.7)	174 (51.3)	339			
High school diploma/GED	714 (58.3)	511 (41.7)	1,225			
Some college credit, but no degree	783 (58.9)	546 (41.1)	1,329			
Associates degree	306 (66.4)	155 (33.6)	461			
College graduate or higher	903 (72.0)	351 (28.0)	1,254			
Education/Used longer*Because hooked[j]				137.782	<.001	0.162
Fifth grade or less completed	14 (50.0)	14 (50.0)	28			
Sixth grade completed	24 (44.4)	30 (55.6)	54			
Seventh grade completed	38 (50.0)	38 (50.0)	76			
Eighth grade completed	63 (57.3)	47 (42.7)	110			
Ninth grade completed	70 (44.6)	87 (55.4)	157			
Tenth grade completed	97 (49.5)	99 (50.5)	196			
Eleventh or twelfth grade completed, no diploma	165 (48.7)	174 (51.3)	339			
High school diploma/GED	714 (58.3)	511 (41.7)	1,225			
Some college credit, but no degree	783 (58.9)	546 (41.1)	1,329			
Associates degree	306 (66.4)	155 (33.6)	461			
College graduate or higher	903 (72.0)	351 (28.0)	1,254			
Education/Used other reason[k]*Oxycontin				30.527	<.001	0.076
<5th grade through 8th grade completed	256 (95.5)	12 (4.5)	268			
Ninth grade completed	144 (91.7)	13 (8.3)	157			

Independent Variables	Combined Types of Opioid Misuse			χ^2	p	Cramer's V
	No	Yes	Total			
	4,704 (99.1%)	525 (0.9%)	5,229			
Tenth grade completed	186 (94.9)	10 (5.1)	196			
Eleventh or twelfth grade completed, no diploma	315 (92.9)	24 (7.1)	339			
High school diploma/GED	1,130 (92.2)	95 (7.8)	1,225			
Some college credit, but no degree	1,235 (92.9)	94 (7.1)	1,329			
Associates degree	444 (96.3)	17 (3.7)	461			
College graduate or higher	1,209 (96.4)	45 (3.6)	1,254			
Education/Used other reason*w/o own Rx[1]				102.108	<.001	0.140
Fifth grade or less completed	19 (67.9)	9 (32.1)	28			
Sixth grade completed	34 (63.0)	20 (27.0)	54			
Seventh grade completed	50 (65.8)	26 (34.2)	76			
Eighth grade completed	79 (71.8)	31 (28.2)	110			
Ninth grade completed	100 (63.7)	57 (36.3)	157			
Tenth grade completed	132 (67.3)	64 (32.7)	196			
Eleventh or twelfth grade completed, no diploma	227 (67.0)	112 (33.0)	339			
High school diploma/GED	879 (71.8)	346 (28.2)	1,225			
Some college credit, but no degree	967 (72.8)	362 (27.2)	1,329			
Associates degree	376 (81.6)	85 (18.4)	461			
College graduate or higher	1,043 (83.2)	211 (16.8)	1,254			
Education/Used other reason*Greater amount				40.775	<.001	0.088
Fifth grade or less completed	23 (82.1)	5 (17.9)	28			

Independent Variables	Combined Types of Opioid Misuse			χ^2	p	Cramer's V
	No	Yes	Total			
	4,704 (99.1%)	525 (0.9%)	5,229			
Sixth grade completed	48 (88.9)	6 (11.1)	54			
Seventh grade completed	68 (89.5)	8 (10.5)	76			
Eighth grade completed	103 (93.6)	7 (6.4)	110			
Ninth grade completed	138 (87.9)	19 (12.1)	157			
Tenth grade completed	177 (90.3)	19 (9.7)	196			
Eleventh or twelfth grade completed, no diploma	308 (90.9)	31 (9.1)	339			
High school diploma/GED	1,117 (91.2)	108 (8.8)	1,225			
Some college credit, but no degree	1,118 (89.4)	141 (10.6)	1,329			
Associates degree	426 (92.4)	35 (7.6)	461			
College graduate or higher	1,196 (95.4)	58 (4.6)	1,254			
Education/Used other reason *Used more often				31.771	<.001	0.078
<5th grade through 8th grade	245 (91.4)	23 (8.6)	268			
Ninth grade completed	139 (88.5)	18 (11.5)	157			
Tenth grade completed	181 (92.3)	15 (7.7)	196			
Eleventh or twelfth grade completed, no diploma	311 (91.7)	28 (8.3)	339			
High school diploma/GED	1,139 (93.0)	86 (7.0)	1,225			
Some college credit, but no degree	1,233 (92.8)	96 (7.2)	1,329			
Associates degree	432 (93.7)	29 (6.3)	461			
College graduate or higher	1,211 (96.6)	43 (3.4)	1,254			
Education/Used other reason*Used other way[m]				38.209	<.001	0.085

Independent Variables	Combined Types of Opioid Misuse			χ^2	p	Cramer's V
	No	Yes	Total			
	4,704 (99.1%)	525 (0.9%)	5,229			
Fifth grade or less completed	22 (78.6)	6 (21.4)	28			
Sixth grade completed	47 (87.0)	7 (13.0)	54			
Seventh Grade completed	65 (85.5)	11 (14.5)	76			
Eighth grade completed	96 (87.3)	14 (12.7	110			
Ninth grade completed	138 (87.9)	19 (12.1)	157			
Tenth grade completed	162 (82.7)	34 (17.3)	196			
Eleventh or twelfth grade completed, no diploma	287 (84.7)	52 (15.3)	339			
High school diploma/GED	1,083 (88.4)	142 (11.6)	1,225			
Some college credit, but no degree	1,195 (89.9)	134 (10.1)	1,329			
Associates degree	421 (91.3)	40 (8.7)	461			
College graduate or higher	1,158 (92.3)	96 (7.7)	1,254			
Education/Used other reason*Used for pain				74.803	<.001	0.120
Fifth grade or less completed	15 (53.6)	13 (46.4)	28			
Sixth grade completed	27 (50.0)	27 (50.0)	54			
Seventh grade completed	44 (57.9)	32 (42.1)	76			
Eighth grade completed	75 (68.2)	35 (31.8)	110			
Ninth grade completed	100 (63.7)	57 (36.3)	157			
Tenth grade completed	131 (66.8)	65 (33.2)	196			
Eleventh or twelfth grade completed, no diploma	222 (65.5)	117 (34.5)	339			
High school diploma/GED	847 (69.1)	378 (30.9)	1,225			

Independent Variables	Combined Types of Opioid Misuse No 4,704 (99.1%)	Yes 525 (0.9%)	Total 5,229	χ^2	p	Cramer's V
Some college credit, but no degree	939 (70.7)	390 (29.3)	1,329			
Associates degree	336 (72.9)	125 (27.1)	461			
College graduate or higher	990 (78.9)	264 (21.1)	1,254			
Education/Used other reason*Used to relax				32.367	<.001	0.079
Fifth grade or less completed	23 (82.1)	5 (17.9)	28			
Sixth grade completed	47 (87.0)	7 (13.0)	54			
Seventh grade completed	65 (85.5)	11 (14.5)	76			
Eighth grade completed	94 (85.5)	16 (14.5)	110			
Ninth grade completed	130 (82.8)	27 (17.2)	157			
Tenth grade completed	166 (84.7)	30 (15.3)	196			
Eleventh or twelfth grade completed, no diploma	286 (84.4)	53 (15.6)	339			
High school diploma/GED	1,074 (87.7)	151 (12.3)	1,225			
Some college credit, but no degree	1,163 (87.5)	166 (12.5)	1,329			
Associates degree	412 (89.4)	49 (10.6)	461			
College graduate or higher	1,153 (91.9)	101	1,254			
Education/Used other reason*to experiment				63.717	<.001	0.110
<5th grade through 8th grade	249 (92.9)	19 (7.1)	268			
Ninth grade completed	136 (86.6)	21 (13.4)	157			
Tenth grade completed	179 (91.3)	17 (8.7)	196			
Eleventh or twelfth grade completed, no diploma	314 (92.6)	25 (7.4)	339			

Independent Variables	Combined Types of Opioid Misuse No 4,704 (99.1%)	Yes 525 (0.9%)	Total 5,229	χ^2	p	Cramer's V
High school diploma/GED	1,172 (95.7)	53 (4.3)	1,225			
Some college credit, but no degree	1,272 (95.7)	57 (4.3)	1,329			
Associates degree	448 (97.2)	13 (2.8)	461			
College graduate or higher	1,224 (97.6)	30 (2.4)	1,254			
Education/Used other reason*Because high				84.648	<.001	0.127
<5th grade through 8th grade completed	249 (92.9)	19 (7.1)	268			
Ninth grade completed	126 (80.3)	31 (19.7)	157			
Tenth grade completed	158 (80.6)	38 (19.4)	196			
Eleventh or twelfth grade completed, no diploma	291 (85.8)	48 (14.2)	339			
High school diploma/GED	1,082 (88.3)	143 (11.7)	1,225			
Some college credit, but no degree	1,167 (87.8)	162 (12.2)	1,329			
Associates degree	431 (93.5)	30 (6.5)	461			
College graduate or higher	1,183 (94.3)	71 (5.7)	1,254			
Education/Used other reason*For sleep				33.299	<.001	0.080
Fifth grade or less completed	23 (82.1)	5 (17.9)	28			
Sixth grade completed	47 (87.0)	7 (13.0)	54			
Seventh grade completed	69 (90.8)	7 (9.2)	76			
Eighth grade completed	102 (92.7)	8 (7.3)	110			
Ninth grade completed	137 (87.3)	20 (12.7)	157			
Tenth grade completed	175 (89.3)	21 (10.7)	196			

Independent Variables	Combined Types of Opioid Misuse No 4,704 (99.1%)	Yes 525 (0.9%)	Total 5,229	χ^2	p	Cramer's V
Eleventh or twelfth grade completed, no diploma	294 (86.7)	45 (13.3)	339			
High school diploma/GED	1,122 (91.6)	103 (8.4)	1,225			
Some college credit, but no degree	1,231 (92.6)	98 (7.4)	1,329			
Associates degree	432 (93.7)	29 (6.3)	461			
College graduate or higher	1,176 (93.8)	78 (6.2)	1,254			
Education/Used for other reason*For emotion				44.927	<.001	0.093
<5th grade through 8th grade completed	242 (90.3)	26 (9.7)	268			
Ninth grade completed	141 (89.8)	16 (10.2)	157			
Tenth grade completed	168 (85.7)	28 (14.3)	196			
Eleventh or twelfth grade completed, no diploma	307 (90.6)	32 (9.4)	339			
High school diploma/GED	1,144 (93.4)	81 (6.6)	1,225			
Some college credit, but no degree	1,247 (93.8)	82 (6.2)	1,329			
Associates degree	438 (95.0)	23 (5.0)	461			
College graduate or higher	1,201 (95.8)	53 (4.2)	1,254			
Education/Used other reason*Other effect				30.331	<.001	0.076
<5th grade through 8th grade completed	254 (94.8)	14 (5.2)	268			
Ninth grade completed	147 (93.6)	10 (6.4)	157			
Tenth grade completed	188 (95.9)	8 (4.1)	196			
Eleventh or twelfth grade completed, no diploma	322 (95.0)	17 (5.0)	339			
High school diploma/GED	1,184 (96.7)	41 (3.3)	1,225			

Independent Variables	Combined Types of Opioid Misuse			χ^2	p	Cramer's V
	No	Yes	Total			
	4,704 (99.1%)	525 (0.9%)	5,229			
Some college credit, but no degree	1,297 (97.6)	32 (2.4)	1,329			
Associates degree	454 (98.5)	7 (1.5)	461			
College graduate or higher	1,233 (98.3)	21 (1.7)	1,254			
Education/Used other reason*Because hooked				25.601	<.001	0.070
<5th grade through 8th grade completed	255 (95.1)	13 (4.9)	268			
Ninth grade completed	149 (94.9)	8 (5.1)	157			
Tenth grade completed	186 (94.9)	10 (5.1)	196			
Eleventh or twelfth grade completed, no diploma	328 (96.8)	11 (3.2)	339			
High school diploma/GED	1,179 (96.2)	46 (3.8)	1,225			
Some college credit, but no degree	1,283 (96.5)	46 (3.5)	1,329			
Associates degree	454 (98.5)	7 (1.5)	461			
College graduate or higher	1,236 (98.6)	18 (1.4)	1,254			

Note. The statistically significant data that support the findings of this study have been reported in this table. To preserve the length and clarity of this document, only salient data are reported, but are available from the author, KG, upon reasonable request. [a]Education is an abbreviation for education level. Any variable abbreviated "Used longer" is a truncated version of *Used pain reliever longer than Rx past 12 months*. "OxyContin" is short for *Used OxyContin not directed by Dr. past 12 months*. [b]Greater amount is short for *Used pain reliever in greater amounts than Rx past 12 months*.

[c]Relieve pain is *Used last pain reliever (not directed) to relieve pain*. [d]Relax is short for *Used pain reliever (not directed) to relax*. [e]Experiment is short for *Used last pain reliever (not directed) to experiment*. [f]To get high is Used last pain reliever (not directed) to get high. [g]Sleep is shorted for *Used last pain reliever (not directed) for sleep*. [h]Emotions is short for *Used last pain reliever (not directed) for emotions*. [i]Effect is short for *Used last pain reliever (not directed) for other drug effect*. [j]Hooked is short for *Used last pain reliever (not directed) because hooked*. [k]Other reason is short for *Used last pain reliever (not directed) for other reason*. [l] W/O own Rx is short for *Used pain reliever without own Rx past 12 months*. [m]Used other way is abbreviated for *Used pain reliever in other way not directed past 12 months*.

Appendix D: Crosstabs of Income and Significant Types of Opioid Misuse Combinations

Independent Variables	Combined Types of Opioid Misuse			χ^2	p	Cramer's V
	No	Yes	Total			
	55,611 (99.1%)	525 (0.9%)	56,136			
Income[a]/Used longer*Oxycontin				13.079	0.004	0.015
Less than $10,000	24,982 (99.4)	163 (0.6)	25,145			
$10,000 to $29,999	13,544 (99.6)	55 (0.4)	13,599			
$30,000 to $49,999	8,037 (99.3)	57 (0.7)	8,094			
$50,000 or more	9,253 (99.5)	45 (0.5)	9,298			
Income/Used longer*not directed for pain				9.497	0.023	0.013
Less than $10,000	24,511 (97.5)	634 (2.5)				
$10,000 to $29,999	13,287 (97.7)	312 (2.3)	13,599			
$30,000 to $49,999	7,862 (97.1)	232 (2.9)	8,094			
$50,000 or more	9,036 (97.2)	262 (2.8)	9,298			
Income/Used other reason*Oxycontin				10.454	0.015	0.014
Less than $10,000	24,988 (99.4)	157 (0.6)	25,145			
$10,000 to $29,999	13,545 (99.6)	54 (0.4)	13,599			
$30,000 to $49,999	8,041 (99.3)	53 (0.7)	8,094			
$50,000 or more	9,252 (99.5)	46 (0.5)	9,298			
Income/Used other reason*For pain				8.817	0.032	0.013
Less than $10,000	24,486 (97.4)	659 (2.6)	25,145			
$10,000 to $29,999	13,269 (97.6)	330 (2.4)	13,599			
$30,000 to $49,999	7,852 (97.0)	242 (3.0)	8,094			

$50,000 or more	9,026 (97.1)	272 (2.9)	9,298			
Income/Used other reason*For sleep				9.178	0.027	0.013
Less than $10,000	24,949 (99.2)	196 (0.8)	25,145			
$10,000 to $29,999	13,508 (99.3)	91 (0.7)	13,599			
$30,000 to $49,999	8,016 (99.0)	78 (1.0)	8,094			
$50,000 or more	9,242 (99.4)	56 (0.6)	9,298			

Note. The statistically significant data that support the findings of this study have been reported in this table. To preserve the length and clarity of this document, only salient data are reported, but are available from the author, KG, upon reasonable request.

[a]Income is short for income level.

Appendix E: Crosstabs of Types of Healthcare Insurance and Significant Types of Opioid Misuse Combinations

Independent Variables	Combined Types of Opioid Misuse			χ^2	p	Cramer's V
	No	Yes	Total			
	55,611 (99.1%)	525 (0.9%)	56,136			
Medicare/Used other reason*Oxycontin			55,937	5.848	0.016	0.010
Not covered	50,790 (99.5)	271 (0.5)	51,061			
Covered	4,837 (99.2)	39 (0.8)	4,876			
Medicaid/Used longer*other reason			55,708	10.416	0.001	0.014
Not covered	42,236 (99.4)	263 (0.6)	42,499			
Covered	13,159 (99.6)	50 (0.4)	13,209			
Medicaid/Used other reason*other effect			55,708	4.126	0.042	0.009
Not covered	42,374 (99.7)	125 (0.3)	42,499			
Covered	13,184 (99.8)	25 (0.2)	13,209			
Tricare etc./Other reason*Because hooked			56,003	4.180	0.041	0.009
Not covered	53,763 (99.7)	156 (0.3)	53,919			
Covered	2,083 (100.0)	1 (0.0)	2,084			
Private Insurance/Other reason*Other effect			55,784	8.501	0.004	0.012
Not covered	21,673 (99.8)	41 (0.2)	21,714			
Covered	33,961 (99.7)	109 (0.3)	34,070			
Private Insurance/Other reason*Because hooked			55,784	7.868	0.005	0.012
Not covered	21,670 (99.8)	44 (0.2)	21,714			

Covered	33,957 (99.7)	113 (0.3)	34,070

Note. The statistically significant data that support the findings of this study have been reported in this table. To preserve the length and clarity of this document, only salient data are reported, but are available from the author, KG, upon reasonable request.

Appendix F: Crosstabs of Combined Types of Healthcare Insurance and Significant Types of Opioid Misuse Combinations

Independent Variables	Combined Types of Opioid Misuse			χ^2	p	Cramer's V
	No	Yes	Total			
	55,611 (99.1%)	525 (0.9%)	56,136			
Longer*Other reason/Medicaid/Private			56,136	4.118	0.042	0.009
No	23,218 (41.6)	32,601 (58.4)	55,819			
Yes	114 (36.0)	203 (64.0)	317			
Other reason*Other effect/Medicaid*Private			56,136	9.262	0.002	0.013
No	23,288 (41.6)	32,698 (58.4)	55,986			
Yes	44 (29.3)	106 (70.7)	150			
Other reason*Other effect/Private*private thru employer			56,136	6.081	0.014	0.01
No	25,781 (46.0)	30,205 (54.0)	55,986			
Yes	54 (36.0)	96 (64.0)	150			
Other reason*Hooked/Medicaid*private			56,136	5.910	0.015	0.01
No	23,281 (41.6)	32,696 (58.4)	55,977			
Yes	51 (32.1)	108 (67.9)	159			

Note. The statistically significant data that support the findings of this study have been reported in this table. To preserve the length and clarity of this document, only salient data are reported, but are available from the author, KG, upon reasonable request.

Appendix G: Binary Logistic Regression Analyses Independent Variables and Types of Prescription Opioid Misuse

Variables in the Equation								
							95% C.I. for Exp(B)	
Characteristic	B	S.E.	Wald	*df*	Sig.	Exp(B)	Lower	Upper
	Combined Prescription Opioid Misuse							
Education								
Fifth grade or less completed	-1.234	.528	5.460	1	.019	.291	.103	.820
Sixth grade completed	-1.431	.528	17.359	1	<.001	.239	.122	.469
Seventh grade completed	-1.190	.303	15.423	1	<.001	.304	.168	.551
Ninth grade completed	-1.269	.234	29.308	1	<.001	.281	.177	.445
Tenth grade completed	-.852	.212	16.232	1	<.001	.427	.282	.646
Eleventh or twelfth grade completed, no diploma	-1.146	.173	43.906	1	<.001	.318	.226	.446
High school diploma/GED	-.459	.124	13.602	1	<.001	.632	.495	.807
Some college credit, but no degree	-.661	.119	30.661	1	<.001	.516	.409	.652
Associates degree	-.391	.165	5.635	1	.018	.677	.490	.934
	Used OxyContin not directed by Dr. past 12 months							
Education								
Ninth grade completed	1.935	.681	8.066	1	.005	6.923	1.821	26.318
High school diploma/GED	.649	.259	6.265	1	.012	1.913	1.151	3.179
Some college credit, but no degree	.559	.255	4.802	1	.028	1.749	1.061	2.885
	Used pain reliever without own Rx past 12 months							
Race								

Variables in the Equation								
							95% C.I. for Exp(B)	
Characteristic	B	S.E.	Wald	*df*	Sig.	Exp(B)	Lower	Upper
Non-Hispanic Whites	-.402	.128	9.784	1	.002	.669	.520	.861
Non-Hispanic Asians	-.719	.239	9.033	1	.003	.487	.305	.779
Non-Hispanic Multiracial	-.922	.251	13.441	1	<.001	.398	.243	.651
Education								
High School Diploma/GED	.395	.145	7.456	1	.006	1.484	1.118	1.970
Some College credit, but no degree	.320	.142	5.082	1	.024	1.377	1.043	1.818
Age								
26-34 years old	.303	.146	4.311	1	.038	1.354	1.017	1.802
	Used pain relievers in greater amounts than Rx past 12 months							
Education								
High school diploma/GED	.549	.275	3.988	1	.046	1.732	1.010	2.968
Some college credit, but no degree	.853	.262	10.598	1	.001	2.347	1.404	3.922
Associates degree	.721	.339	4.530	1	.033	2.057	1.059	3.995
Healthcare insurance								
Private plan thru employer/union	.723	.248	8.485	1	.004	2.061	1.267	3.354
	Used pain reliever more often than Rx past 12 months							
Education								
Ninth grade completed	.941	.442	4.537	1	.033	2.563	1.078	6.094
	Used pain reliever longer than Rx past 12 months							
Sex								
Males	-.513	.182	7.965	1	.005	.599	.419	.855
Education								
Eleventh or twelfth Grade completed, no diploma	-1.115	.418	7.116	1	.008	.328	.145	.744

Variables in the Equation								
							95% C.I. for Exp(B)	
Characteristic	B	S.E.	Wald	*df*	Sig.	Exp(B)	Lower	Upper
High school diploma/GED	-.684	.274	6.221	1	.013	.504	.295	.864
	Used last pain reliever (not directed) to relieve pain							
Race/Hispanicity								
Non-Hispanic Whites	.503	.181	7.734	1	.005	1.654	1.160	2.357
Non-Hispanic Blacks	.551	.265	4.315	1	.038	1.735	1.032	2.918
Sex								
Male	-.621	.128	23.583	1	<.001	.538	.418	.691
Education								
Ninth grade completed	-1.024	.321	10.174	1	.001	.359	.191	.674
	Used last pain reliever (not directed) to relax							
Race								
Non-Hispanic Whites	-.423	.187	5.102	1	.024	.655	.454	.946
Seventh grade completed	-1.242	.635	3.822	1	.051	.289	.083	1.003
Age								
14-15 years old	.714	.340	4.399	1	.036	2.041	1.048	3.977
	Used last pain reliever (not directed) to experiment							
Education								
Ninth grade completed	1255	.464	7.322	1	.007	3.508	1.413	8.707
Age								
14-15 years old	1.193	.569	4.397	1	.036	3.298	1.081	10.063
16-17 years old	1.301	.563	5.345	1	.021	3.671	1.219	11.057
	Used last pain reliever (not directed) to get high							
Race								
Non-Hispanic Whites	-.446	.198	5.071	1	.024	.640	.434	.944
Non-Hispanic Blacks	-.724	.306	5.592	1	.018	.485	.266	.883
Education								
Ninth grade completed	1.028	.349	8.657	1	.003	2.794	1.409	5.541

Variables in the Equation								
							95% C.I. for Exp(B)	
Characteristic	B	S.E.	Wald	*df*	Sig.	Exp(B)	Lower	Upper
Some college credit, no degree	.511	.233	4.790	1	.029	1.666	1.055	2.632
	Used last pain reliever (not directed) for sleep							
Race								
Non-Hispanic HI/Other Pacific Islanders	3.275	1.207	7.366	1	.007	26.455	2.484	281.708
Income								
$10,000 to $29,999	.696	.261	7.125	1	.008	2.006	1.203	3.345
$30,000 to $49,999	.544	.252	4.669	1	.031	1.723	1.052	2.822
Age								
21-25 years old	-.736	.275	7.159	1	.007	.479	.280	.821
26-34 years old	-.532	.263	4.080	1	.043	.587	.351	.984
	Used last pain reliever (not directed) because hooked							
Non-Hispanic Native HI/Alaskan	2.579	1.106	5.435	1	.020	13.182	1.508	115.247
Education								
High school diploma/GED	1.711	.635	7.269	1	.007	5.537	1.596	19.215
Some college credit, but no degree	1.483	.636	5.435	1	.020	4.408	1.267	15.340
	Used last pain reliever (not directed) other reason							
Income								
Less than $10,000	1.101	.496	4.925	1	.026	3.006	1.137	7.948
	Used longer/Used OxyContin not as directed							
Education								
Ninth grade completed	1.004	.402	6.229	1	.013	2.730	1.241	6.007
Eleventh or twelfth grade completed, no diploma	.666	.329	4.097	1	.043	1.947	1.021	3.712
High school diploma/GED	.640	.236	7.386	1	.007	1.897	1.195	3.010

Variables in the Equation								
							95% C.I. for Exp(B)	
Characteristic	B	S.E.	Wald	*df*	Sig.	Exp(B)	Lower	Upper
Some college credit, but no degree	.783	.227	11.862	1	<.001	2.188	1.401	3.417
	Used longer/Used in greater amounts							
Sex								
Male	-.311	.122	6.546	1	.011	.732	.577	.930
Education								
Tenth grade completed	.618	.314	3.875	1	.049	1.855	1.003	3.433
Eleventh or twelfth grade completed, no diploma	.570	.266	4.596	1	.032	1.769	1.050	2.980
Some college credit, but no degree	.634	.179	12.521	1	<.001	1.885	1.327	2.678
Healthcare insurance								
Medicare	.585	.286	4.188	1	.041	1.794	1.025	3.141
Private Plan through employer or union	.520	.195	7.115	1	.008	1.681	1.148	2.463
	Used longer/Used more often							
Sex								
Male	-.367	.136	7.280	1	.007	.693	.530	.904
Education								
Ninth Grade completed	.974	.341	8.161	1	.004	2.649	1.358	5.167
	Used longer/Used in other ways than directed							
Education								
Tenth grade completed	.537	.271	3.923	1	.048	1.710	1.006	2.909
Eleventh or twelfth Grade completed, no diploma	.473	.231	4.178	1	.041	1.604	1.020	2.524
	Used longer/Used not as directed to relieve pain							

Variables in the Equation								
							95% C.I. for Exp(B)	
Characteristic	B	S.E.	Wald	*df*	Sig.	Exp(B)	Lower	Upper
Sex								
Male	-.293	.082	12.853	1	<.001	.746	.636	.876
Education								
Sixth grade completed	1.380	.344	16.109	1	<.001	3.976	2.026	7.802
Seventh grade completed	.915	.309	8.798	1	.003	2.498	1.364	4.574
Tenth grade completed	.777	.213	13.233	1	<.001	2.174	1.431	3.303
Eleventh or twelfth grade, no diploma	.854	.177	23.270	1	<.001	2.350	1.661	3.325
High school diploma/GED	.497	.125	15.950	1	<.001	1.644	1.288	2.099
Some college credit, no degree	.521	.121	18.542	1	<.001	1.683	1.328	2.134
Associates degree	.456	.163	7.827	1	.005	1.578	1.146	2.172
	Used longer/Used not as directed to relax							
Education								
Fifth grade or less completed	1.125	.526	4.573	1	.032	3.080	1.098	8.637
Sixth grade completed	1.300	.344	14.327	1	<.001	3.671	1.872	7.198
Seventh grade completed	1.043	.297	12.305	1	<.001	2.837	1.584	5.080
Eighth grade completed	.659	.266	6.150	1	.013	1.933	1.148	3.255
Ninth grade completed	1.290	.231	31.208	1	<.001	3.634	2.311	5.715
Tenth grade completed	1.103	.202	29.707	1	<.001	3.013	2.027	4.480
Eleventh or twelfth grade, no diploma	1.300	.168	59.675	1	<.001	3.671	2.639	5.105
high school diploma/GED	.618	.114	29.551	1	<.001	1.856	1.485	2.319
Some college credit, no degree	.695	.111	.39.524	1	<.001	2.004	1.613	2.489

Variables in the Equation								
							95% C.I. for Exp(B)	
Characteristic	B	S.E.	Wald	*df*	Sig.	Exp(B)	Lower	Upper
Associates Degree	.486	.151	10.360	1	.001	1.625	1.209	2.185
	Used longer/Used not as directed to experiment							
Education								
Fifth grade or less completed	1.125	.526	4.573	1	.032	3.080	1.098	8.637
Sixth grade completed	1.300	.344	14.327	1	<.001	3.671	1.872	7.198
Seventh grade completed	1.043	.297	12.305	1	<.001	2.837	1.584	5.080
Eighth grade completed	.659	.266	6.150	1	.013	1.933	1.148	3.255
Ninth grade completed	1.290	.231	31.208	1	<.001	3.634	2.311	5.715
Tenth grade completed	1.103	.202	29.707	1	<.001	3.013	2.027	4.480
Eleventh or twelfth grade, no diploma	1.300	.168	59.675	1	<.001	3.671	2.639	5.105
High school diploma/GED	.618	.114	29.551	1	<.001	1.856	1.485	2.319
Some college credit, no degree	.695	.111	.39.524	1	<.001	2.004	1.613	2.489
Associates degree	.486	.151	10.360	1	.001	1.625	1.209	2.185
	Used Longer/Used to get high							
Education								
Fifth grade or less completed	1.125	.526	4.573	1	.032	3.080	1.098	8.637
Sixth grade completed	1.300	.344	14.327	1	<.001	3.671	1.872	7.198
Seventh grade completed	1.043	.297	12.305	1	<.001	2.837	1.584	5.080
Eighth grade completed	.659	.266	6.150	1	.013	1.933	1.148	3.255
Ninth grade completed	1.290	.231	31.208	1	<.001	3.634	2.311	5.715
Tenth grade completed	1.103	.202	29.707	1	<.001	3.013	2.027	4.480

Variables in the Equation								
							95% C.I. for Exp(B)	
Characteristic	B	S.E.	Wald	*df*	Sig.	Exp(B)	Lower	Upper
Eleventh or twelfth grade, no diploma	1.300	.168	59.675	1	<.001	3.671	2.639	5.105
High school diploma/GED	.618	.114	29.551	1	<.001	1.856	1.485	2.319
Some college credit, no degree	.695	.111	.39.524	1	<.001	2.004	1.613	2.489
Associates degree	.486	.151	10.360	1	.001	1.625	1.209	2.185
	Used longer/Used for sleep							
Education								
Fifth grade or less completed	1.125	.526	4.573	1	.032	3.080	1.098	8.637
Sixth grade completed	1.300	.344	14.327	1	<.001	3.671	1.872	7.198
Seventh grade completed	1.043	.297	12.305	1	<.001	2.837	1.584	5.080
Eighth grade completed	.659	.266	6.150	1	.013	1.933	1.148	3.255
Ninth grade completed	1.290	.231	31.208	1	<.001	3.634	2.311	5.715
Tenth grade completed	1.103	.202	29.707	1	<.001	3.013	2.027	4.480
Eleventh or twelfth grade, no diploma	1.300	.168	59.675	1	<.001	3.671	2.639	5.105
High school diploma/GED	.618	.114	29.551	1	<.001	1.856	1.485	2.319
Some college credit, no degree	.695	.111	.39.524	1	<.001	2.004	1.613	2.489
Associates degree	.486	.151	10.360	1	.001	1.625	1.209	2.185
	Used longer/Used for emotions							
Education								
Fifth grade or less completed	1.125	.526	4.573	1	.032	3.080	1.098	8.637
Sixth grade completed	1.300	.344	14.327	1	<.001	3.671	1.872	7.198
Seventh grade completed	1.043	.297	12.305	1	<.001	2.837	1.584	5.080

Variables in the Equation								
							95% C.I. for Exp(B)	
Characteristic	B	S.E.	Wald	*df*	Sig.	Exp(B)	Lower	Upper
Eighth grade completed	.659	.266	6.150	1	.013	1.933	1.148	3.255
Ninth grade completed	1.290	.231	31.208	1	<.001	3.634	2.311	5.715
Tenth grade completed	1.103	.202	29.707	1	<.001	3.013	2.027	4.480
Eleventh or twelfth grade, no diploma	1.300	.168	59.675	1	<.001	3.671	2.639	5.105
High school diploma/GED	.618	.114	29.551	1	<.001	1.856	1.485	2.319
Some college credit, no degree	.695	.111	.39.524	1	<.001	2.004	1.613	2.489
Associates degree	.486	.151	10.360	1	.001	1.625	1.209	2.185
	Used longer/Used for other drug effect							
Education								
Fifth grade or less completed	1.125	.526	4.573	1	.032	3.080	1.098	8.637
Sixth grade completed	1.300	.344	14.327	1	<.001	3.671	1.872	7.198
Seventh grade completed	1.043	.297	12.305	1	<.001	2.837	1.584	5.080
Eighth grade completed	.659	.266	6.150	1	.013	1.933	1.148	3.255
Ninth grade completed	1.290	.231	31.208	1	<.001	3.634	2.311	5.715
Tenth grade completed	1.103	.202	29.707	1	<.001	3.013	2.027	4.480
Eleventh or twelfth grade, no diploma	1.300	.168	59.675	1	<.001	3.671	2.639	5.105
High school diploma/GED	.618	.114	29.551	1	<.001	1.856	1.485	2.319
Some college credit, no degree	.695	.111	.39.524	1	<.001	2.004	1.613	2.489
Associates degree	.486	.151	10.360	1	.001	1.625	1.209	2.185
	Used Longer/Used because of being hooked							
Education								

Variables in the Equation								
							95% C.I. for Exp(B)	
Characteristic	B	S.E.	Wald	*df*	Sig.	Exp(B)	Lower	Upper
Fifth grade or less completed	1.125	.526	4.573	1	.032	3.080	1.098	8.637
Sixth grade completed	1.300	.344	14.327	1	<.001	3.671	1.872	7.198
Seventh grade completed	1.043	.297	12.305	1	<.001	2.837	1.584	5.080
Eighth grade completed	.659	.266	6.150	1	.013	1.933	1.148	3.255
Ninth grade completed	1.290	.231	31.208	1	<.001	3.634	2.311	5.715
Tenth grade completed	1.103	.202	29.707	1	<.001	3.013	2.027	4.480
Eleventh or twelfth grade, no diploma	1.300	.168	59.675	1	<.001	3.671	2.639	5.105
High school diploma/GED	.618	.114	29.551	1	<.001	1.856	1.485	2.319
Some college credit, no degree	.695	.111	.39.524	1	<.001	2.004	1.613	2.489
Associates degree	.486	.151	10.360	1	.001	1.625	1.209	2.185
	Used longer/Used for other reason							
Healthcare Insurance								
Medicare	.818	.403	4.122	1	.042	2.266	1.029	4.989
	Used for other reason/Used OxyContin not as directed by Dr.							
Education								
Ninth grade completed	1.205	.411	8.613	1	.003	3.337	1.492	7.461
Eleventh or twelfth grade, no diploma	.927	.333	7.744	1	.005	2.526	1.315	4.851
High school diploma/GED	.853	.249	11.764	1	<.001	2.347	1.441	3.821
Some college credit, but no degree	.895	.244	13.446	1	<.001	2.447	1.517	3.949
	Used for other reason/Used without own RX							
Education								

Variables in the Equation								
							95% C.I. for Exp(B)	
Characteristic	B	S.E.	Wald	*df*	Sig.	Exp(B)	Lower	Upper
Sixth grade completed	.920	.367	6.269	1	.012	2.508	1.221	5.152
Seventh grade completed	1.112	.314	12.528	1	<.001	3.040	1.642	5.627
Eighth grade completed	.707	.292	5.852	1	.016	2.027	1.144	3.593
Ninth grade completed	1.241	.242	26.347	1	<.001	3.457	2.153	5.552
Tenth grade completed	1.058	.217	23.747	1	<.001	2.879	1.882	4.406
Eleventh or twelfth grade completed	1.148	.181	40.464	1	<.001	3.153	2.213	4.491
High school diploma/GED	.681	.131	26.880	1	<.001	1.975	1.527	2.555
Some college credit, no degree	.716	.128	31.359	1	<.001	2.045	1.592	2.628
	Used for other reason/Used in greater amount							
Education								
Fifth grade or less completed	1.740	.678	6.577	1	.010	5.697	1.507	21.533
Ninth grade completed	1.324	.355	13.931	1	<.001	3.760	1.876	7.537
Tenth grade completed	1.081	.340	10.087	1	.001	2.947	1.513	5.743
Eleventh or twelfth grade, no diploma	1.035	.292	12.615	1	<.001	2.816	1.590	4.986
High school diploma/GED	.733	.225	10.598	1	.001	2.081	1.339	3.234
Some college credit, no degree	1.014	.214	22.490	1	<.001	2.757	1.813	4.193
Associates degree	.617	.288	4.589	1	.032	1.854	1.054	3.262
Healthcare Insurance								
Medicare	.648	.319	4.124	1	.042	1.911	1.023	3.571
Private plan thru employer or union	.530	.208	6.500	1	.011	1.699	1.130	2.553

Variables in the Equation								
							95% C.I. for Exp(B)	
Characteristic	B	S.E.	Wald	*df*	Sig.	Exp(B)	Lower	Upper
	Used for other reason/Used more often							
Education								
Seventh grade completed	1.048	.515	4.149	1	.042	2.853	1.040	7.822
Ninth grade completed	1.623	.356	20.802	1	<.001	5.067	2.523	10.178
Tenth grade completed	.975	.375	6.754	1	.009	2.651	1.271	5.532
Eleventh or twelfth grade, no diploma	.907	.323	7.890	1	.005	2.478	1.316	4.667
High school diploma/GED	.732	.243	9.052	1	.003	2.079	1.291	3.350
Some college credit, but no degree	.704	.240	8.632	1	.003	2.022	1.264	3.235
Associates degree	.617	.310	3.968	1	.046	1.854	1.010	3.403
	Used for other reason/Used in other ways not directed							
Education								
Ninth grade completed	.794	.336	5.572	1	.018	2.211	1.144	4.274
Tenth grade completed	.956	.287	11.099	1	<.001	2.602	1.483	4.568
Eleventh or twelfth grade, no diploma	.884	.247	12.769	1	<.001	2.420	1.490	3.930
High school diploma/GED	.646	.184	12.296	1	<.001	1.908	1.330	2.738
Some college credit, but no degree	.433	.186	5.416	1	.020	1.542	1.071	2.220
	Used for other reason/Used to relieve pain							
Sex								
Male	-.239	.081	8.790	1	.003	.788	.673	.922
Education								
Fifth grade or less completed	1.584	.530	8.927	1	.003	4.873	1.724	13.774

Variables in the Equation								
							95% C.I. for Exp(B)	
Characteristic	B	S.E.	Wald	*df*	Sig.	Exp(B)	Lower	Upper
Sixth grade completed	1.392	.344	16.388	1	<.001	4.021	2.050	7.887
Seventh grade completed	1.331	.300	19.616	1	<.001	3.784	2.100	6.820
Ninth grade completed	.745	.244	9.287	1	.002	2.106	1.304	3.400
Tenth grade completed	.889	.211	17.766	1	<.001	2.433	1.609	3.678
Eleventh or twelfth grade, no diploma	1.005	.175	33.124	1	<.001	2.732	1.940	3.846
High school diploma/GED	.617	.123	25.175	1	<.001	1.854	1.457	2.360
Some college credit, no degree	.551	.120	20.877	1	<.001	1.734	1.369	2.196
Associates degree	.472	.162	8.424	1	.004	1.602	1.165	2.203
	Used for other reason/Used to relax							
Education								
Eighth grade completed	.772	.373	4.271	1	.039	2.164	1.041	4.499
Ninth grade completed	1.059	.307	11.910	1	<.001	2.884	1.580	5.263
Tenth grade completed	.991	.281	12.453	1	<.001	2.693	1.553	4.668
Eleventh or twelfth Grade, no diploma	.898	.240	13.977	1	<.001	2.455	1.533	3.932
High school diploma/GED	.517	.182	8.060	1	.005	1.677	1.174	2.397
Some college credit, no degree	.681	.175	15.180	1	<.001	1.976	1.403	2.784
Associates degree	.594	.230	6.649	1	.010	1.811	1.153	2.844
	Used for other reason/Used to experiment							
Education								
Ninth grade completed	1.825	.362	25.449	1	<.001	6.204	3.053	12.609

Variables in the Equation								
							95% C.I. for Exp(B)	
Characteristic	B	S.E.	Wald	*df*	Sig.	Exp(B)	Lower	Upper
Eleventh or twelfth grade, no diploma	.919	.354	6.733	1	.009	2.506	1.252	5.014
	Used for other reason/Used to get high							
Sex								
Male	.352	.120	8.536	1	.003	1.421	1.123	1.799
Education								
Ninth grade completed	1.794	.292	37.621	1	<.001	6.013	3.389	10.666
Tenth grade completed	1.239	.296	17.484	1	<.001	3.451	1.931	6.168
Eleventh or twelfth grade, no diploma	1.111	.257	18.638	1	<.001	3.037	1.834	5.029
High school diploma/GED	.701	.201	12.155	1	<.001	2.016	1.359	2.989
Some college credit, no degree	.856	.194	19.510	1	<.001	2.354	1.610	3.442
	Used for other reason/Used to sleep							
Race								
Non-Hispanic HI/Other Pacific Islander	1.733	.723	5.745	1	.017	5.659	1.372	23.351
Education								
Fifth grade or less completed	1.383	.670	4.260	1	.039	3.988	1.072	14.831
Ninth grade completed	.760	.360	4.454	1	.035	2.138	1.056	4.331
Eleventh or twelfth grade, no diploma	1.075	.247	18.913	1	<.001	2.930	1.805	4.757
Income								
Less than $10,000	.547	.255	4.600	1	.032	1.729	1.048	2.851
10,000 to $29,999	.513	.224	5.237	1	.022	1.671	1.076	2.593
$30,000 to $49,999	.523	.211	6.123	1	.013	1.687	1.115	2.554
Age								

Variables in the Equation								
							95% C.I. for Exp(B)	
Characteristic	B	S.E.	Wald	*df*	Sig.	Exp(B)	Lower	Upper
21-25 years old	-.563	.227	6.133	1	.013	.570	.365	.889
	Used for other reason/Used for emotions							
Education								
Ninth grade completed	1.108	.373	8.827	1	.003	3.027	1.458	6.286
Tenth grade completed	1.290	.321	16.172	1	<.001	3.634	1.938	6.816
Eleventh or twelfth grade, no diploma	.800	.308	6.747	1	.009	2.225	1.217	4.067
High school diploma/GED	.515	.233	4.878	1	.027	1.674	1.060	2.643
	Used for other reason/Used for other drug effect							
Education								
Ninth grade completed	1.668	.441	14.341	1	<.001	5.303	2.236	12.575
Eleventh or twelfth grade completed	1.254	.378	10.983	1	<.001	3.505	1.669	7.358
	Used for other reason/Used because of being hooked							
Education								
Ninth grade completed	1.329	.514	6.677	1	.010	3.776	1.378	10.345
Tenth grade completed	1.104	.507	4.747	1	.029	3.017	1.117	8.149
Eleventh or twelfth grade, no diploma	.874	.458	3.634	1	.057	2.396	.976	5.885
High school diploma/GED	1.044	.331	9.954	1	.002	2.842	1.485	5.437
Some college credit, but no degree	.950	.331	8.246	1	.004	2.586	1.352	4.945

Note. The statistically significant data that support the findings of this study have been reported in this table. To preserve the length and clarity of this document, only salient data are reported, but are available from the author, KG, upon reasonable request.